Research and Development Series

THE IMPACT OF HIGHER EDUCATION LEADERSHIP, GOVERNANCE AND MANAGEMENT RESEARCH:

MINING THE 2014 RESEARCH EXCELLENCE FRAMEWORK IMPACT CASE STUDIES

Full Report

Dr Elizabeth M Morrow

Inspiring Leadership | Leadership Foundation for Higher Education

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Foreword

The impact agenda is moving at pace through higher education. Impact is increasingly central to universities' research strategies. Whilst the term 'impact' is bandied about and we think we know what it means, there is little consensus in the sector about how impact is achieved, what kind of organisational conditions support and nurture it, or what success looks like.

Impact is a priority for higher education research but there are very few anchors or compasses to orientate university leaders and the research community towards it. To find direction through this complex territory, the Leadership Foundation for Higher Education has commissioned this study of impact case studies from leadership, governance and management (LGM) research submitted to the 2014 Research Excellence Framework (REF) assessment. The REF impact case study database provides, for the first time, a landmark resource for learning about research impact.

This study set out to gain a conceptual handle on LGM research impact in terms of the processes and mechanisms involved. In particular, we were interested in mapping out how LGM research in these case studies led to change, made a difference or had impact. The results will help universities think through issues of impact: what the rationale is for understanding impact, why impact is important, and how it can be shown and maximised in its different contexts. The report provides practical advice for the academic community about finding routes to impact. In particular, the Adaptive Systems Framework for Advancing Research (AS-FAR) will be useful for researchers in their impact planning and reporting. It can contribute to the development of pathways to impact.

The Leadership Foundation envisages that this research report will add value to the important work universities are doing to position, plan and develop institutional capacity for impact. It will also help inform activities across the higher education sector to enhance the impact of LGM research in the future. Alongside this full report by Dr Elizabeth Morrow,there is a summary report available and we commissioned a separate report by Professor Sue Dopson and colleagues which reviews available literature on the impact of leadership development interventions in UK higher education and their effectiveness. We hope that these reports will be read and used together as they "stake out the ground" and illuminate what we mean by impact from multiple perspectives. Each is frank about the challenges of measurement and offers a conceptual model of the routes to impact from research as well as questions for future research.

Professor Fiona Ross CBE
Director of Research, Leadership Foundation for Higher Education

List of tables, figures and boxes

Headline findings

Higher education in the UK is currently facing some considerable challenges to show and improve its educational, research, social and economic impact. The unfolding of the impact agenda places higher education under the external gaze of political and public scrutiny. At the same time, the impact agenda offers a lens through which the higher education sector might see opportunities for change from individual teaching or research endeavours, to impact at departmental or institutional levels, and across the sector as a whole. The diverse interests, ideologies and complex politics associated with impact mean there is a need to build a theoretically informed evidence base to guide the practice and assessment of different areas of higher education impact.

The work of the Leadership Foundation for Higher Education (the Leadership Foundation) on research impact aims to help universities think through issues of impact: what the rationale is for understanding impact, why impact is important, and how it can be shown and maximised. The study presented here explored the impact of higher education leadership, governance and management (LGM) research by drawing on research information returned by higher education institutions (HEIs) in the 2014 Research Excellence Framework (REF) assessment. For the first time, the 2014 REF included structured impact case studies which were used to assess the impact of research beyond academia. A searchable database of over 6,000 case studies is available online[1].

The aim of the study was to explore the impact of higher education LGM research, including building knowledge about the meaning of impact in this context, routes to impact and methods to evidence and assess impact. The study used a combination of text mining and qualitative research methods to analyse a sample of 1,309 case studies relating to LGM research. Research impact was approached as a Complex Adaptive System (CAS), highlighting the complexity of the contexts, processes and mechanisms involved. From this perspective, LGM researchers can shape both how research impact is defined and how research impact is achieved. Headline findings presented below cross-reference to relevant sections of the report.

There is substantial LGM research going on in the higher education sector and evidence of LGM research impact is significant.

A substantial proportion of the 154 UK universities that submitted to the 2014 REF (86%, n=131 HEIs) returned case studies considered to be within the field of LGM research. The average per HEI was 8.5, with some submitting over 30 LGM case studies.

A high proportion of case studies (61%, n=802) were found to be within Units of Assessment (UOAs) for business and management studies, education, politics and international studies, social work and social policy. These are subjects that were covered by REF panel C.

There is strong evidence of LGM research impact in terms of the following:

- *Use of evidence* (type I impact) to inform law, government policy, strategy, regulation, standards, guidelines or recommendations for practice, or priorities for research or practice
- *Use of research products* (type II impact), such as a training programme or course, intervention (programme or initiative), toolkit, model, decision aid, system (operational), support network, technology, measure, benchmark, information resource, research method, participation method, teaching method, visual art, music or fiction
- *Effect on individuals* (type III impact), such as change in awareness, attitude, understanding (knowledge) or behaviour
- *Effect on groups/organisations* (type IV impact) including knowledge-transfer (intra-organisation, inter-organisation or network), organisational development (innovation, new systems or structures), or organisational performance (impact on end-users).

The categories above could imply different stages in reaching impact (from type I to type IV impact). However, the case study data shows that these types of impact are not necessarily sequential and research use may not always lead to measurable effects.

1 http://impact.ref.ac.uk/CaseStudies

There are four major groups of beneficiaries of LGM research but most case studies only describe impact on research users.

The beneficiaries of LGM research are as follows:

- *People who use research outputs* (research users), for example policymakers, service providers, leaders, managers, educators or practitioners. The majority of the included case studies reported on use of evidence or research products (type I and II impact).
- *People benefiting from the outcomes of the research* (end-users) who may or may not be directly involved in the research, such as staff, students, patients, customers, business service users or groups of the public. Reported impact includes improvements in experiences or user outcomes, improved potential to access services, knowledge or resources (type III impact).
- *People directly influencing or having a stake in the research* (stakeholders), for example policymakers, commissioners, regulators or collaborators in the research. Reported impact includes improvements in the systems and structures through which research is initiated and supported (type IV impact).
- *People who are responsible for the governance and undertaking of research* (researchers), which may or may not include collaborators in the research. Reported impact includes improvements in research infrastructure, research capacity, researcher skills, and organisational performance in research assessment (type IV impact).

There is some evidence of the impact of LGM research on HEIs.

Analysis of a subsample of 20 selected LGM case studies (Chapter 4) shows that impact of LGM research on HEIs included: improvements in leadership skills and behaviours, equality and diversity in leadership roles, coordination and leadership capacity development, management development, change management, organisational improvement, and new LGM research methods. The mean reported timeframe to impact of LGM research in higher education contexts was seven years, but it often took longer to develop research products, such as training programmes or interventions, and to see the effects of research on individuals, groups or organisations. Analysis of spread shows that the first reported place of impact was most often at a national level, with subsequent spread of impact towards the local (organisational) level.

Researchers can take a proactive approach to plan, monitor and report on research impact.

Analysis of routes to impact reveals eight interrelated processes of impact generation through which impact may be cultivated (described in Chapter 4) as follows:

- researcher impact skills
- contextual leverage
- stakeholder engagement
- public/user involvement
- designing research for impact
- mechanisms for exchange
- developing impactful outputs
- implementing and evaluating outcomes.

An Adaptive Systems Framework for Advancing Research (AS-FAR) is developed to enable researchers to plan, predict and assess LGM research impact (Figure 11, Chapter 7).

There is still much to learn about the effectiveness of different routes to impact in different research contexts. However, there is good evidence about mechanisms for stimulating interest in the research, ways of keying into the interests of beneficiaries, mechanisms for spreading knowledge, and ways to build knowledge. The case study data suggests that the contribution of public/user involvement to research impact includes research that is more relevant and able to address public/user views, greater spread of impact of research through public/user groups and networks, improved public/user capacity for involvement in research, and enhanced research practices and researcher skills to work with the public/users (Chapter 4).

There are also lessons for researchers about reporting on research impact (Chapter 5). Case studies that made the most convincing claims to impact show causality, use measures and indicators, address issues of attribution and contribution, emphasise progression or spread of impact, show systematic capture of impact information, and present a tailored account using an active authorship style.

There is some consistency in outcome measures that could inform future LGM research and assessment.

Researchers have used and developed many different measures for LGM research (described in Chapter 5) including:

- *Measures of effect* to show changes in performance, productivity, effectiveness, learning, skills or knowledge, decision-making, behaviour, and health or social impact
- *Measures of importance* including clinical or psychological assessment or diagnosis, inequalities, and community needs
- *Measures of value*, such as individual attitude or attributes, experiences, perception, economic, safety, political, social, employee engagement, and participation.

These measures could help to inform future LGM research and the assessment of research impact. In relation to research impact in higher education contexts, measures have been developed to evaluate HEI performance and regional contribution, learner retention, attainment, transition from learning to work, measures of work and life satisfaction, student selection and assessment of competencies (described in Chapter 5).

There is significant potential for the study to inform future research and development on LGM research impact in and beyond UK higher education. Possible ways forward are suggested in Chapter 7.

Chapter 1. Introduction

1.1 Purpose of the report

Leadership, governance and management are diverse fields of practice that are multidisciplinary and cross sectoral. As large, complex public sector institutions such as universities, local government and the NHS search for evidence-based approaches to improve leadership, performance and competitiveness, it is becoming increasingly important to understand how research outcomes have led to change, made a difference or had an impact.

Evidence of research impact is useful for:

- understanding the social impact of research
- judging research in terms of its effects, value and importance
- maximising the impact of research in the future.

Leadership, Governance and Management (LGM) research seeks to build evidence of human interactions at individual, team and organisational levels[2,3]. It provides leaders with evidence to inform their decisions and actions to lead a group of people or an organisation, and to improve their ability to do this[4,5]. LGM research informs governors about strategies and actions to govern a state, organisation, or peoples[6,7]. It also provides managers with evidence to inform the process of dealing with or controlling things or people[8]. Thus the users of LGM research include policymakers, commissioners, regulators or collaborators in the research, including research funders, government, industry, and commercial, community, voluntary, educational and public service organisations[9,10,11,12] and the end-users of such organisations and services.

To achieve even greater benefits from LGM research in the future, it is important that understandings of LGM research impact align with the types of outcomes and processes that are important to LGM research. This requires finding evidence of the types of outputs and outcomes that are distinct to LGM research. It also requires finding ways to tease out the contribution of LGM research to change within complex social and organisational contexts[13,14,15,16,17]. At the same time, there are bigger moral issues to consider about the types of impact that LGM does, and should in the future, seek to have on different areas of society, as well as more immediate practical issues for LGM researchers about taking the right types of steps towards maximising research impact.

2 Bolden, R. (2010). Leadership, management and organisational development, in Gold, J., Thorpe, R. & Mumford, A. (eds) Gower Handbook of Leadership and Management Development. Farnham: Gower.
3 Yammarino, F. & Dansereau, F. (2008). Multi-level nature of and multi-level approaches to leadership. The Leadership Quarterly 19(2): 135–41.
4 Hamlin, B. (2010). Evidence-based leadership and management development, in Gold, J., Thorpe, R. & Mumford, A. (eds) Gower Handbook of Leadership and Management Development. Farnham: Gower 197–220.
5 Atwood, M., Mora, J. & Kaplan, A. (2010). Learning to lead: evaluating leadership and organizational learning. Leadership & Organization Development Journal 31(7): 576–95.
6 Bargh, C., Scott, P. & Smith, D. (1996). Governing Universities. Changing the Culture? Bristol: Taylor & Francis.
7 Bevir, M. (2013). Governance: A very short introduction. Oxford: Oxford University Press.
8 Ittner, C. & Larcker, D. (1998). Innovations in performance measurement: trends and research implications. Journal of Management Accounting Research 10: 205.
9 Wilsdon J., Wynne, B. & Stilgoe, J. (2005). We need to infuse the culture and practice of science with a new set of social possibilities. The Public Value of Science. London: Demos.
10 Bass, B. & Stogdill, R. (1990). Handbook of Leadership (vol. 11). New York: Free Press.
11 Kezar, A., Carducci, R. & Contreras-McGavin, M. (2006). Rethinking the 'L' word in higher education: The revolution of research on leadership. ASHE Higher Education Report. London: John Wiley & Sons.
12 Day, D. (2001). Leadership development: A review in context. The Leadership Quarterly 11(4): 581–613.
13 Burns, J. (2001). Complexity science and leadership in healthcare. Journal of Nursing Administration 31(10): 474–82.
14 Brown, C. (2008). The use of complex adaptive systems as a generative metaphor in an action research: study of an organisation. Qual Report 13(3): 416–31
15 Palmberg, K. (2009). Complex adaptive systems as metaphors for organizational management. Learning Organization 16(6): 483–98.
16 Chadwick, M. (2010). Creating order out of chaos: a leadership approach. AORN J 91(1): 154–70.
17 Flinn, K. & Mowles, C. (2014). A complexity approach to leadership development: developing practical judgement. Stimulus Paper. London: Leadership Foundation for Higher Education.

The purpose of this report is to examine the multifaceted concept of research impact in relation to LGM research. Research impact covers an extensive range of issues about research practice, research management, research assessment, researcher skills and capacity development as well as issues about the types of research outputs that are useful to research users and the outcomes of research for beneficiaries. It is challenging, if not impossible, to unpick the concept to examine any one issue in isolation. Hence understanding research impact takes time, consideration of different perspectives, and a critical eye to where the focus on research impact falls.

To understand research impact, there is a need to unpack the complex processes of interaction between researchers and non-academic groups, such as collaborators, stakeholders and research users. This includes exploring the different positions and roles of diverse groups of people and the different types of processes of interaction involved, such as collaboration, engagement and involvement in the research. Public/user involvement in research is now seen as an essential part of many research fields and disciplines, in contrast to seeing end-users as the passive subjects or beneficiaries of research.

A degree of caution is necessary when examining research impact because where the focus is placed can influence the types of research outputs that are valued[18] and the types of research that are undertaken[19,20]. How research impact is approached, by research funders and assessors for example, has implications for individual researchers in terms of incentives[21], recognition and esteem[22]. Research funders such as the Higher Education Funding Council for England (Hefce) and Research Councils UK are emphasising the importance of planning, predicting and assessing research impact[23,24]. These financial drivers have suddenly woken up universities to important questions about how to show and increase research impact[25,26].

Research impact has become a key factor in the global marketing and profile of HEIs nationally and in international world university rankings. Universities value the opportunity to show their research impact on an international stage[27]. Collection and collation of research information are time consuming but can underpin business intelligence and an HEI's ability to plan and manage its research portfolio[28]. HEIs have a vested interest in achieving quality-related income but also to support their brand and reputation[29].

As a result, the higher education sector has seen the rapid emergence of 'impact industries'. Many HEIs have developed reporting structures and research management systems to monitor research outputs[30,31,32]. HEIs have reflected on where their skill base for research impact lies and have invested in building researcher skills and knowledge. Researcher development programmes have been devised including the Association of Research Managers and Administrators (ARMA) professional development framework (www.arma.ac.uk), the Association for University Research and Industry Links (AURIL) knowledge transfer CPD framework (www.auril.org.uk) and Vitae's researcher development framework (www.vitae.ac.uk).

18 Penfield, T., Baker, M., Scoble, R. & Wykes, M. (2014). Assessment, evaluations, and definitions of research impact: a review. Research Evaluation 23 (1): 21–32.

19 Whitley, R., & Gläser, J. (eds). (2008). The changing governance of the sciences: The advent of research evaluation systems (vol. 26). Berlin: Springer Science & Business Media.

20 Brewer, J. D. (2011). The impact of impact. Research Evaluation 20(3): 255–56.

21 Upton, S., Vallance, P. & Goddard, J. (2014). From outcomes to process: evidence for a new approach to research impact assessment. Research Evaluation 23 (4): 352–65.

22 EDAP (2015). Equality and diversity in the 2014 Research Excellence Framework. A report by the Equality and Diversity Advisory Panel.

23 RCUK (2015). Research Councils UK. Pathways to Impact. http://www.rcuk.ac.uk/innovation/impacts/

24 Morgan Jones, M. & Grant J. (2013). Making the grade: methodologies for assessing and evidencing research impact, in Dean et al (eds) 7 Essays on Impact. DESCRIBE Project Report for Jisc. University of Exeter.

25 Given, L. M., Kelly, W. & Willson, R. (2015). Bracing for impact: the role of information science in supporting societal research impact, in Proceedings of the 78th ASIS&T Annual Meeting: Information Science with Impact: Research in and for the Community (p. 48). American Society for Information Science.

26 Greenhalgh, T., Robert, G., Macfarlane, F., Bate, P., Kyriakidou, O. & Peacock, R. (2005). Storylines of research in diffusion of innovation: a meta-narrative approach to systematic review. Social Science & Medicine 61(2): 417–30.

27 Hefce (2015a). REF Accountability Review. Bristol: Higher Education Funding Council for England.

28 UKRISS (2014). UK Research Information Shared System. Final Report. https://ukriss.cerch.kcl.ac.uk/

29 Hefce (2015b). The Metric Tide – Report of the Independent Review of the Role of Metrics in Research Assessment and Management. Bristol: Higher Education Funding Council for England.

30 Leitner, K. H., & Warden, C. (2004). Managing and reporting knowledge-based resources and processes in research organisations: specifics, lessons learned and perspectives. Management accounting research, 15(1): 33–51.

31 Grant, J., Brutscher, P., Kirk, S., Butler, L. & Wooding, S. (2010). Capturing research impacts: a review of international practice. Documented briefing. Cambridge: RAND.

32 Carter, I. (2013). The impact of impact on universities: skills, resources and organisational structures, in Dean et al (eds) 7 Essays on Impact. DESCRIBE Project Report for Jisc. University of Exeter.

While HEIs strive to encourage researchers to achieve greater research impact, researchers may have concerns about the demands on their time, working with external partners or opening up research to the influence or scrutiny of stakeholders[33]. Research impact is often viewed as a rigorous – some might say arduous – process of external scrutiny of academic research[34,35,36]. This is largely because research assessment exercises have had considerable influence over how research impact is understood and approached[37,38,39,40]. It is therefore not surprising that some researchers have argued that the impact agenda is a utilitarian or bureaucratic exercise to gain managerial control of academic research[41].

A counter-argument to criticisms towards research impact is that when research is funded by public money, the moral question of how such research benefits society is necessary for reducing the waste that occurs when findings are not implemented[42]. Thus current debates about research impact are concerned with issues about the best way to fairly and efficiently judge academic research impact[43]. The focus of these debates is on measuring research impact after it has occurred.

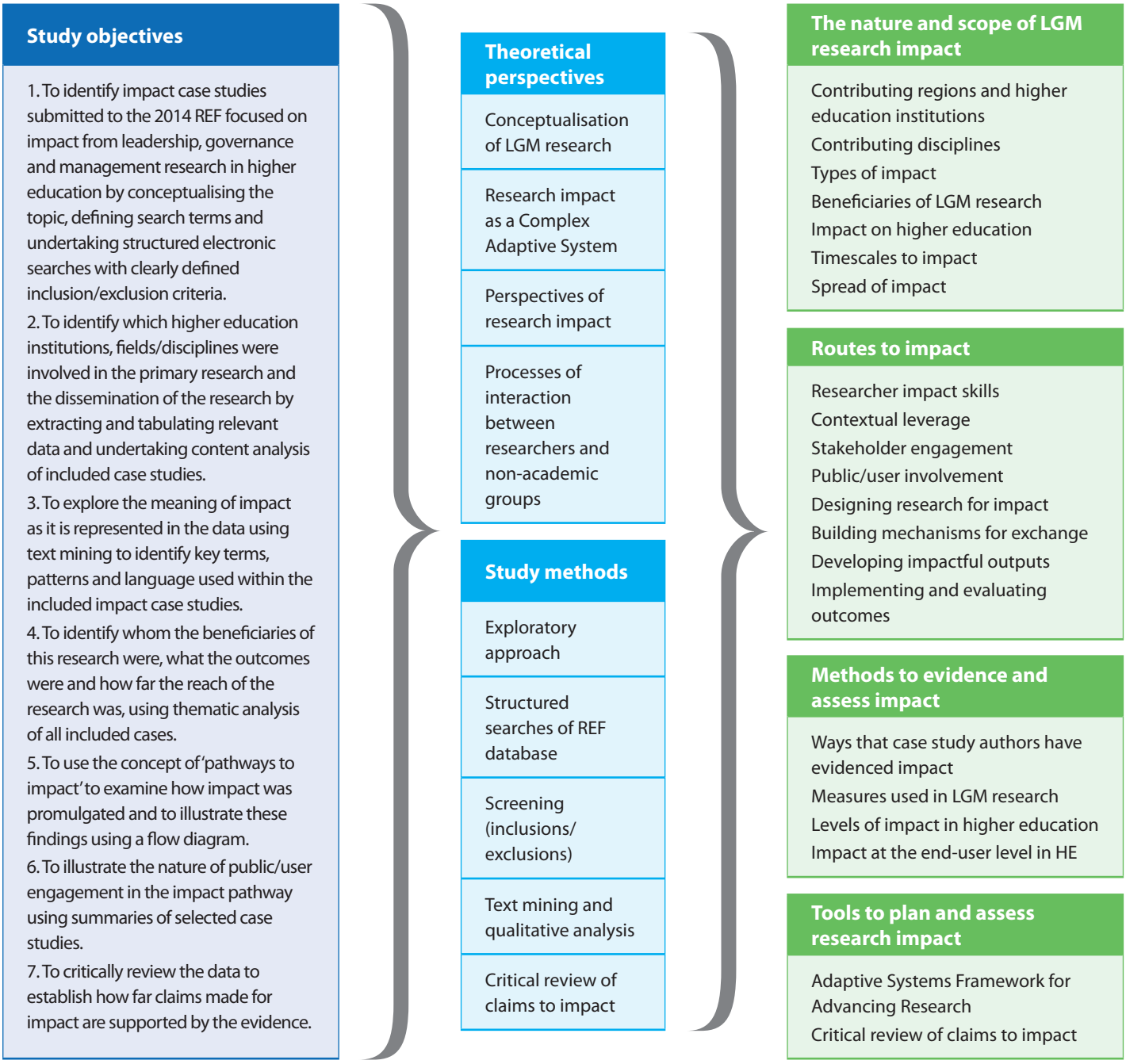
This report takes a broader focus on research impact to consider the role of research contexts, processes and mechanisms in creating research impact and the importance of the formative role of research impact on research institutions[44,45,46,47,48]. This perspective contrasts with the metric- or pure outcome-based conceptions of research impact which are currently dominating political and professional debate. This perspective also acknowledges that deriving benefits from LGM research is not a simple linear process; it is multi-iterative, parallel, multi-dimensional and absorptive, and involves both push and pull[49].

The aim of the study reported here was to draw on information captured in the 2014 Research Excellence Framework to explore issues about the impact of HE LGM research. Specifically, the study sought to build knowledge about the meaning of impact in this context, routes to impact, and methods to evidence and assess impact.

Figure 1 provides a visual overview of the study.

33 LSE Public Policy Group (2011). Maximising the impacts of your research: A handbook for social scientists. London: London School of Economics and Political Science.
34 Bornmann, L., Mutz, R., Neuhaus, C. & Daniel, H. D. (2008). Citation counts for research evaluation: standards of good practice for analyzing bibliometric data and presenting and interpreting results. Ethics in Science and Environmental Politics 8(1): 93–102.
35 Banzi, R., Moja, L., Pistotti, V., Facchini, A. & Liberati, A. (2011). Conceptual frameworks and empirical approaches used to assess the impact of health research: an overview of reviews. Health Res Policy Syst 9: 26.
36 Milat, A., Bauman, A. & Redman, S. (2015). A narrative review of research impact assessment models and methods. Health Res Policy Syst 13: 18.
37 Penfield, T., Baker, M., Scoble, R. & Wykes, M. (2014). Assessment, evaluations, and definitions of research impact: a review. Research Evaluation 23 (1): 21–32.
38 LSE Public Policy Group (2011). Maximising the impacts of your research: A handbook for social scientists. London: London School of Economics and Political Science.
39 Grant, J., Brutscher, P., Kirk, S., Butler, L. & Wooding, S. (2010). Capturing research impacts: a review of international practice. Documented briefing. Cambridge: RAND.
40 Sarli, C. C., Dubinsky, E. K. & Holmes, K. L. (2010). Beyond citation analysis: a model for assessment of research impact. Journal of the Medical Library Association 98(1): 17.
41 Martin B. (2011). The Research Excellence Framework and the 'impact agenda': are we creating a Frankenstein monster? Research Evaluation 20: 247.
42 Walshe, K. & Davies, H. (2013). Health research, development and innovation in England from 1988 to 2013: from research production to knowledge mobilization. J Health Serv Res Policy 18: 1–12.
43 Hefce (2015b) The Metric Tide - Report of the Independent Review of the Role of Metrics in Research Assessment and Management. Higher Education Funding Council for England.
44 Buxton, M. (2011). The payback of 'Payback': challenges in assessing research impact. Research Evaluation, 20(3): 259–60.
45 Donovan, C. (2011). State of the art in assessing research impact: introduction to a special issue. Research Evaluation 20(3): 175–79.
46 Bornmann, L. (2013). What is societal impact of research and how can it be assessed? A literature survey. Journal of the American Society for Information Science and Technology 64(2): 217–33.
47 Morgan Jones, M. & Grant J. (2013). Making the grade: methodologies for assessing and evidencing research impact, in Dean et al (eds) 7 Essays on Impact. DESCRIBE Project Report for Jisc. University of Exeter.
48 Hefce (2015
49 Carter, I. (2013). The impact of impact on universities: skills, resources and organisational structures, in Dean et al (eds) 7 Essays on Impact. DESCRIBE Project Report for Jisc. University of Exeter.

Figure 1: Overview of the study



1.2 Research impact in the 2014 Research Excellence Framework

The 2014 Research Excellence Framework (2014 REF) was conducted jointly by the Higher Education Funding Council for England (Hefce), the Scottish Funding Council (SFC), the Higher Education Funding Council for Wales (Hefcw) and the Department for Employment and Learning, Northern Ireland (DEL) to assess the quality of research for HEIs. The 2014 REF produced research assessment outcomes for each submission made by HEIs including the assessment of impact case studies. The assessment outcomes were used by the four higher education funding bodies to inform the selective allocation of their grant for research to institutions, with effect from 2015-16. REF assessment provides accountability for public investment in research and produces evidence of the benefits of this investment. The assessment outcomes provide benchmarking information and establish reputational yardsticks, for use within the higher education sector and for public information.

For the first time, the 2014 REF took research impact into consideration. The 2014 REF assessed the impact of higher education research outside academia (referred to as 'non-academic' impact). The assessment of impact was based on expert review of case studies submitted by universitie[50]. Case studies could include any social, economic or cultural impact or benefit beyond academia that took place during the assessment period (1 January 2008 to 31 July 2013) and was underpinned by excellent research produced by the submitting institution within a given timeframe. Submissions also included information about how the unit has supported and enabled impact during the assessment period[51].

Submissions were assessed in respect of impact that took place during the assessment period, and not future or potential impact[52]. Impact or benefits arising from engaging the public with the submitted unit's research was considered. Dissemination activity, without evidence of its benefits, was not considered as impact.

To be credited for an impact, the submitting unit had to show that it undertook research that made a distinctive contribution to achieving the claimed impact or benefit and that meets standards of excellence that are competitive with international comparators. The submitting unit did not need to have undertaken all of the contributing research, or have been involved in exploiting the research. The timeframe for the underpinning research was up to 15 years between the publication of research output(s) that made a distinctive contribution to the impact, and the start of the assessment period (January 2008).

Case studies were submitted using a generic template[53], with word limits (four pages of text). This was designed to enable institutions to explain and demonstrate clearly research impact through a narrative that included indicators and evidence as appropriate to the case being made.

The template required information about:

- title of case study
- summary of the impact (indicative maximum 100 words), a brief statement of what impact is being covered by the case study
- underpinning research (indicative maximum 500 words), the key research insights or findings that underpinned the impact, and details of what research was undertaken, when and by whom
- references to the research (indicative maximum six references), references to key outputs from the research described in the previous section, and evidence about the quality of the research
- details of the impact (indicative maximum 750 words) including the way in which the submitting unit's research contributed to the impact or benefit, and the nature and extent of the impact or benefit
- sources to corroborate the impact (indicative maximum 10 references).

50 REF (2011a). Research Excellence Framework 2014. Decisions for assessing research impact http://www.ref.ac.uk/media/ref/content/pub/decisionsonassessingresearchimpact/01_11.pdf

51 REF (2011b). Research Excellence Framework 2014. Assessment framework and guidance on submissions. July 2011.

52 REF (2011a). Research Excellence Framework 2014. Decisions for assessing research impact http://www.ref.ac.uk/media/ref/content/pub/decisionsonassessingresearchimpact/01_11.pdf

53 REF (2011b). Research Excellence Framework 2014. Assessment framework and guidance on submissions. July 2011 p 52.

REF guidance[54] suggested authors should provide a narrative, with supporting evidence, to explain how the research underpinned (made a distinct and material contribution to) the impact and the nature and extent of the impact. Case study authors were advised to provide a clear explanation of the process or means through which the research led to, underpinned or made a contribution to the impact (for example, how it was disseminated, how it came to influence users or beneficiaries, or how it came to be exploited, taken up or applied). Where the submitted unit's research was part of a wider body of research that contributed to the impact (for example, where there had been research collaboration with other institutions), authors were advised to specify the particular contribution of the submitted unit's research and to acknowledge other key research contributions.

Authors were also asked to provide:

- details of the beneficiaries – who or what community, constituency or organisation has benefited, been affected or impacted on
- details of the nature of the impact – how they have benefited, been affected or impacted on
- evidence or indicators of the extent of the impact described, as appropriate to the case being made
- dates of when these impacts occurred[55].

The outcomes of the REF impact assessment was an impact sub-profile for each submission, published in December 2014. The impact sub-profile shows the proportion of the submission at each starred level (1* to 4* and 'Unclassified'). Case studies were assessed against the broad generic criteria of reach and significance of the impact or benefit.

1.3 The REF impact case study database

Over 6,000 REF impact case studies have been made publicly available on a searchable web-based database[56]. The REF impact case study database offers an unrivalled body of information on research impact, and a great deal of learning about research impact is now possible. The case studies are uniformly presented, while preserving original detail and text, to support accessibility. Original files can also be downloaded. Case studies have been tagged with information about fields of research, impact types and location of activity to enable indexing and faster searching based on HEI, region or subject area, for example. Flexible keyword-based searching is also available, supported by a high level of search functionality. Many of the research publication references in case studies have been individually identified to enable access to supporting information. The case study data, although collected for assessment purposes, provides a unique resource for in-depth analysis and the development of new methodologies and approaches for the analysis of research impact.

High-level analysis of the REF impact case studies

The REF impact case studies were analysed by King's College London (by the Policy Institute at King's and Digital Humanities departments), working in conjunction with Digital Science, a division of Macmillan Science & Education, and its sister company Nature Publishing Group. This analysis was co-funded by the UK funding bodies, Research Councils UK and the Wellcome Trust. This has produced a high-level analysis[57] of the impact of the case studies using text mining and qualitative analysis techniques to identify general patterns and themes. The analysis focused on assessing the nature, scale and beneficiaries of research impact in different impact topic areas.

54 ibid
55 ibid p53
56 http://impact.ref.ac.uk/CaseStudies/
57 King's College London and Digital Science (2015). The nature, scale and beneficiaries of research impact: An initial analysis of Research Excellence Framework (REF) 2014 impact case studies. Bristol: Higher Education Funding Council for England.

Some of the key findings were as follows:

- UK HEIs have made a diverse range of contributions to society including changes and benefits to the economy, society, culture, public policy and services, health, the environment and quality of life[58].
- The research underpinning societal impacts is multidisciplinary and the social benefit arising from research is 'multi-impactful'[59] (60 impact topics are identified).
- Text mining was used to identify 37 categories of beneficiaries[60]. There are groups potentially benefiting from the case studies relating to their field of research (eg writers benefiting from studies in Panel D, engineers benefiting from studies in Panel B); however, the analysis also suggests that impact created can be cross-disciplinary and reach a wide range of members of society.
- It takes an estimated three to nine years for research to have an impact on society (based on analysis of references to the research), and the speed by which that impact occurs varies by discipline[61].
- In relation to geographical reach, UK academics have made contributions to the wealth and well-being of all nations globally[62].

1.4 Overview of the methodological approach

Approach

An exploratory approach was chosen to enable investigation and knowledge-building about LGM research and its impact. The approach allowed for exploration of concepts, theory-building and the simultaneous inclusion of experimental and non-experimental research in order to more fully understand LGM research impact[63]. It would not have been appropriate to use experimental methods to control or randomise the data. The aim was not to undertake a detailed case-by-case analysis of research impact, but to explore the impact of higher education LGM research.

The approach drew upon theoretical perspectives derived from the research literature to conceptualise LGM research, explore key concepts of research impact, examine processes of researcher and stakeholder interaction, and to develop a multifaceted model of LGM research impact. These perspectives are described in Chapter 2.

For rigour and validity, a structured approach to searching and analysis of the REF case study database was taken[64]. The searches used key terms derived from the literature to identify the most relevant LGM case studies (Table 1). LGM key terms were validated with the commissioners of the research for consistency with terms in the LGM field and fit with the study aims[65]. The search terms were examined as a complete set and refined to remove unnecessary overlap of terms and to truncate plural forms of key terms (eg 'human resource' rather than 'human resources').

Multiple searches of the REF database were needed to ensure the search was broad enough to retrieve all relevant LGM case studies. Only by doing various iterations of keyword searches could the appropriate sample be identified. Details of each search and its results were recorded to keep track of the search history. Once found, 3,874 case studies were downloaded and combined in one Microsoft Excel spreadsheet. After 1,308 duplicates were removed, 2,566 case studies remained for screening.

Figure 2 illustrates the search history.

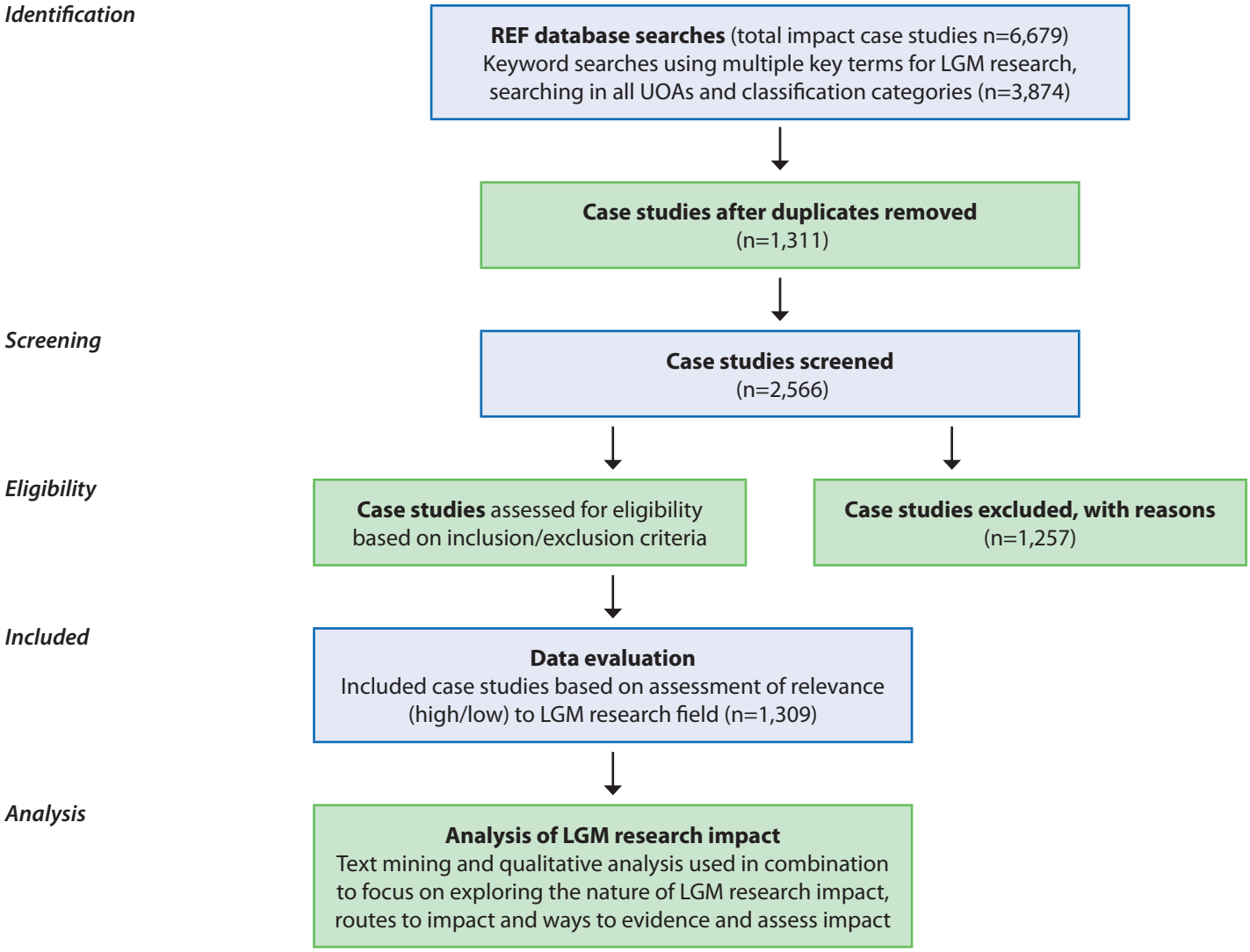
58 ibid p12
59 ibid p6
60 ibid p43
61 ibid p45
62 ibid p6
63 Denzin, N. & Lincoln, Y. (eds) (2005). The Sage Handbook of Qualitative Research (3rd ed). Thousand Oaks, CA: Sage.
64 Ritchie, J., Lewis, J., Nicholls, C. M. & Ormston, R. (eds) (2013). Qualitative research practice: A guide for social science students and researchers.). Thousand Oaks, CA: Sage.
65 Denzin, N. & Lincoln, Y. (eds) (2005). The Sage Handbook of Qualitative Research (3rd ed). Thousand Oaks, CA: Sage.

Table 1: Keyword searches

Keywords for LGM field	Number of case studies
leadership	768
governance	505
management (*Business and Management Studies UOA only)	314
transformative	141
teamwork	22
"team work"	70
"organisational development"	20
"organisational transformation"	2
"organisational change"	45
"community development"	80
"organisational innovation"	3
"organisational policy"	12
"community engagement"	137
managerial	85
"corporate responsibility"	11
entrepreneurship	86
"human resource"	61
careers	167
business (*Business and Management Studies UOA only)	338
marketing (*Business and Management Studies UOA only)	73
"business strategy"	35
accountability	201
"knowledge transfer"	533
mentor	63
coaching	86
"strategic change"	14
"systems change"	2
Total	**3,874**

Notes;
* Owing to the very high number of returns for the keywords 'management' (2,633), 'business' (1,979) and 'marketing' (591) and the high potential for false positives, these keyword searches were limited to case studies returned under the Business and Management Studies Unit of Assessment (UOA) only.

Figure 2: Search history



Screening of such a large number of returned case studies involved making a judgement about the relevance of each case study to LGM research and the overall aims of the study. Through initial reading and familiarisation with the returned case studies (reading article titles and summary of impact), a framework for inclusion/exclusion was developed. As screening progressed, the criteria were further refined with the research commissioners in an iterative process of reading, modifying the criteria and screening. The resulting inclusion/exclusion criteria (Box 1) were systematically applied to the remaining returned case studies to identify the sample.

Box 1: Inclusion and exclusion criteria

(i) ***Included:*** case studies that relate to human dimensions of LGM, research involving the leadership, governance or management of people, communities or organisations, such as individuals, professional groups, communities, marginalised groups or the general public.

Excluded: case studies that do not primarily relate to LGM of people, communities or organisations, such as research on: the development or use of physical spaces such as land use, buildings or bridges, water distribution, or conservation areas; the development or use of commodities such as food crops, textiles, biological pesticides, fisheries, construction materials, antibodies or pharmaceuticals; the development of technologies such as astronomical satellites, nanotechnologies, genetic diagnostics, forensic tests, rail network signalling or ticketing technologies, computer software, carbon-dating systems, or emission monitoring equipment; the preservation of histories such as artefacts, human remains, sites of historical interest, collections or cultural heritage; and the study of animals, endangered or extinct species, such as their anatomy, physiology, cognition or behaviour.

(ii) ***Included:*** case studies that describe identifiable research outputs (research evidence, research products or novel ideas).

Excluded: case studies that describe research outputs in very general terms (such as 'new knowledge', 'insights' or 'substantial research').

(iii) ***Included:*** case studies that describe impact (eg influence, incorporation, uptake or effect) caused by a research output.

Excluded: case studies that only describe impact in very general terms (such as 'widespread dissemination', 'diverse benefits', 'significant impact', 'profound effect' or 'changing the discourse') or case studies that only express an intended impact (such as 'to inspire' or 'to inform public understanding').

As the study commissioners were particularly interested examining the impact of LGM research on the higher education context, case studies that described impact on higher education organisations, staff or students were tagged during screening (using the code higher education -subset in a separate column in Microsoft Excel). A subsample of 20 highly relevant case studies to the higher education context was identified. This set of case studies was used for focused analyses of LGM impact on HE, timescales to impact, and spread of LGM research.

After screening, a total of 1,309 case studies were included in the final sample. Case studies that did not meet inclusion criteria were excluded with reasons (n=1,257). The sample is nearly one fifth (19.6%) of all 6,679 case studies included in the REF impact case study database. Data from all included case studies were extracted to tables in Microsoft Excel for analysis. Data categories extracted were: Submitting Institution, Unit of Assessment (UOA), Title, Summary of the Impact, Underpinning Research, References to the Research, Details of the Impact, and Sources to Corroborate the Impact.

Analysis

Text mining and qualitative analysis were used in combination to explore the included case study data and to build knowledge of research impact. Text mining describes a range of tasks to examine data including information retrieval, lexical analysis (to study word frequency distributions), pattern recognition, tagging/annotation, information extraction, link and association analysis[66]. Text mining was supported by the use of specialist qualitative analysis software (QDA Miner). The main feature of the QDA Miner program that was used in this study was intuitive coding using organised tree structures. Analysis involved exploring the data and using emerging themes (from the qualitative analysis) to build code frameworks (using the function Add codes) to capture information about research impact. Coded sections of text were automatically highlighted by colour and annotated with the name of the code category. Once a code framework was developed, it was systematically applied to the data using keyword searches. This enabled systematic searches of the content of the data as a whole.

66 King's College London and Digital Science (2015). The nature, scale and beneficiaries of research impact: An initial analysis of Research Excellence Framework (REF) 2014 impact case studies. Bristol: Higher Education Funding Council for England.

Within the QDA Miner program, keyword searches were applied to different sections of data (for example Underpinning Research or Details of the Impact). This type of analysis enabled a deeper understanding of the usage of terms and processes contributing to research impact. A search function (Code retrieval) was used to retrieve codes and to analyse the frequency of codes across the data (counts and percentage figures). Functions to generate summary tables and graphs were used to enable interpretation of the analyses.

Qualitative analysis was used to move from analysis of the raw data into explanation and interpretation of the issues[67]. Analysis mostly used a deductive approach to examine predefined issues and concepts relating to research impact to group the data and then look for similarities and differences. At other times an inductive approach was used to generate findings from the case study data, for example using emerging themes to identify impact processes and then to look for relationships between them.

Specific qualitative techniques used were as follows:

- *familiarisation:* examining the REF case study database and gaining an understanding of the functionality of the database, the structure of the case studies and the types of content reported under different headings;
- *charting:* used as an analytic tool to support analyses in situations when it was important to explore the relationships between different themes or components of research impact;
- *coding:* as described above, coding was used within the QDA Miner program to organise the data and as a means to generate quantitative findings (counts, percentages and frequencies for example) and to demarcate segments of text based around keywords and referred to as open-ended coding[68];
- *summarising:* summaries were created by progressively synthesising information, for example lists of codes or text, to reduce the volume of information without losing meaning;
- *visualisation:* presentation of the information included using visual displays such as flow diagrams, word clouds, charts and graphs.

Validity of the analysis was supported by researcher immersion in the data and prolonged engagement with the sample[69].

Critical review drawing on the theoretical perspectives described in Chapter 2 was used to assess how far claims made for impact are supported by the evidence.

1.5 Caveats and limitations of the analysis

Although the REF impact case study database is an unparalleled source of detailed data, the context in which the case studies were produced affects the data. The accounts are heavily influenced by the REF guidance criteria[70]. Owing to the focus of the REF on impact beyond higher education, impacts to do with higher education contexts are underrepresented in the data. It is likely that much more research on or about higher education was not submitted because of the risk it would be discounted as being academic impact. The implication for this study is that it is likely that the actual impact of LGM research on higher education contexts is greater than the case study data suggests.

The impact case study data is also influenced by case study authors' interpretations of research impact and expectations about what the panels of REF research assessors might be looking for. By examining LGM case studies across UOA in the present study, these differences become more noticeable. The sentiment in the language of the case studies is universally positive, reflecting its purpose as part of an assessment process[71]. At the same time, there was a need for authors to self-regulate their accounts so as not to appear to make exaggerated or false claims. Hence some authors provide a strong and convincing account of the link between research and impact, while others do not.

67 Denzin, N. & Lincoln, Y. (eds) (2005). The Sage Handbook of Qualitative Research (3rd ed). Thousand Oaks, CA: Sage.
68 Strauss, A. & Corbin, J. (1990). Basics of Qualitative Research: Grounded Theory Procedures and Techniques. New Delhi: Sage.
69 Lincoln, Y. & Guba, E. (1985). Naturalistic Inquiry. Newbury Park, CA: Sage.
70 REF (2011b) Research Excellence Framework 2014. Assessment framework and guidance on submissions. July 2011.
71 King's College London and Digital Science (2015). The nature, scale and beneficiaries of research impact: An initial analysis of Research Excellence Framework (REF) 2014 impact case studies. Bristol: Higher Education Funding Council for England.

The study was devised and undertaken in the UK context where an emerging impact agenda awards value to the social impact of research and research behaviours that extend research beyond its academic use. The laws, conventions and social rules that govern academic research are likely to differ in other countries which could result in different interpretations and understandings of research impact. It is also likely that subcultures of religion, social class, special needs and sexuality for example could have a bearing on how research impact is perceived, including by the author of this report and commissioners of the study. If there had been a longer study timeframe, it would have been interesting to use observational methods such as interviews, and survey or focus groups to test the findings with LGM researchers.

Owing to the complexity of LGM research, it was necessary to use multiple structured searches and a high level of screening (reading each case study title) to ensure that sampling captured LGM case studies. The approach demanded a significant amount of researcher time to screen the data but an advantage was that this supported researcher familiarity with the data. A further challenge was that it was not always easy to decide on the criteria that constitute 'LGM' research. This is why the final inclusion/exclusion criteria were refined through screening rather than being wholly defined by the conceptualisation of LGM research derived from the literature at the outset. Thus the validity of the sample relates both to the definition of LGM research developed and the key search terms applied in the study.

Chapter 2. Theoretical perspectives used in the study

This chapter of the report explains the theoretical perspectives that inform the study. The chapter covers:

- the conceptualisation of LGM research developed and applied in the study
- how Complex Adaptive Systems theory was used in the study to develop a multifaceted framework for LGM research impact
- key perspectives of research impact derived from the research literature and explored in the data
- key concepts used to examine processes of interaction between researchers and stakeholders in relation to achieving research impact.

2.1 Conceptualising LGM research

Work to conceptualise the LGM topic area was important for identifying an appropriate study sample from the REF impact case study database. Searches to identify broad themes of LGM research in the existing literature were undertaken using Google Scholar. The websites of HEIs known to be engaged in leadership or management research were also searched for research themes (30 UK HEIs). Components of the field – leadership, governance and management – were explored in turn. Conceptualisation was supported by discussions with Leadership Foundation commissioners about their knowledge of the LGM field.

A broad perspective of the field of LGM was purposely developed from themes in the research literature in order to explore the diversity of higher education LGM research, including for example different disciplinary fields, theoretical perspectives and approaches that have been used. The conceptualisation is illustrated in Figure 3. Details of each theme and examples from higher education research are provided below.

Components of leadership

Leadership has been defined as including any strategy or action to enhance the capacity of organisations and the people within them to better achieve their purpose[72]. As such, leadership research is closely tied to the strategic mission of organisations and to their internal and external structures and systems[73]. The web-based searches identified the following components of leadership.

Leader knowledge and skill development

Research in this area includes studies of leader skills and knowledge of leadership approaches or practices[74] and studies of effectiveness of leadership approaches, styles or models of leadership[75,76]. Important theoretical frameworks are human capital development[77], authentic leadership, identity construction and the use of self in leadership[78]. Research studies might include development and evaluation of skills-based courses or programmes of leadership development (eg leadership development initiatives within and/or beyond universities, including development of leaders in other sectors outside higher education such as health or government)[79,80]. It also includes studies of leadership training packages, tools for reflective practice, mentoring or learning resources (eg emotional intelligence training)[81].

72 Hamlin, B. (2010). Evidence-based leadership and management development, in Gold, J., Thorpe, R. & Mumford, A. (eds) Gower Handbook of Leadership and Management Development. Farnham: Gower 197–220.
73 Atwood, M., Mora, J. & Kaplan, A. (2010). Learning to lead: evaluating leadership and organizational learning. Leadership & Organization Development Journal 31(7): 576–95.
74 Matusak, L. (1997). Finding your voice: learning to lead – anywhere you want to make a difference. San Francisco: Jossey-Bass.
75 Davies, J., Hides, M., & Casey, S. (2001). Leadership in higher education. Total Quality Management 12: 7–8, 1025–30.
76 Lumby, J. (2012). What Do We Know About Leadership In Higher Education? The Leadership Foundation for Higher Education's research. London: Leadership Foundation for Higher Education.
77 Day, D. (2001). Leadership development: A review in context. The Leadership Quarterly 11(4): 581–613.
78 Nyberg, D., & Sveningsson, S. (2014). Paradoxes of authentic leadership: Leader identity struggles. Leadership 10(4)437–55.
79 Tourish, D. (2012). Leadership development within the UK higher education system: its impact on organisational performance, and the role of evaluation. Stimulus Paper. London: Leadership Foundation for Higher Education.
80 Day, D. (2001). Leadership development: A review in context. The Leadership Quarterly 11(4): 581–613.
81 Ashkanasy, N. & Dasborough, M. (2003). Emotional awareness and emotional intelligence in leadership teaching. Journal of Education for Business 79(1): 18–22.

Collaboration and teamwork

Research on collaboration and teamwork focuses on the configuration and effects of formal organisational leadership, including governing bodies, autocratic and strategic leadership (eg in higher education, roles of governors, boards, heads and their functional roles)[82]. Research on the leadership of collaborations[83] suggests leadership is not so much vested in a person or a position, but in a relationship based on trust, obligation and commitment. Studies have examined plural forms of organisational leadership, where leadership is shared in teams, pooled at the top of organisations, spread (or distributed) across boundaries over time, or produced through interaction[84]. Important theoretical perspectives are delegated leadership or virtual teams[85], including senior leadership teams[86] and departmental leadership[87,88], as well as distributed leadership[89] or dispersed leadership[90]; for the purpose of 'democratic organisation' or 'instrumental delegation'[91]. Studies may also draw on theories of complexity leadership, where leadership is approached as a complex interactive dynamic, from which adaptive outcomes such as learning, innovation and adaptability emerge[92,93,94]. Another perspective is boundary-spanning leadership[95,96], (vertical, horizontal, stakeholder, demographic and geographic[97]), which may be used to convey goals, or share information or learning (eg in higher education, inter-organisational network leadership, collaborations, partnerships, research and authorship).

Leader, follower and situation

Research in the area of leader, follower and situation (LFS) approaches leadership as an influence relationship among leaders and followers[98]. Studies may draw upon leader–member exchange theory[99] or focus on interactions between leader–follower and situation[100]. Engaging leadership considers how leaders inspire and gain commitment from others[101]. Research on this area is sometimes referred to as a 'post-heroic' perspective, where leadership is explored as a social process that occurs in and through human interactions[102]. It may also include the study of cultural influences on leadership[103].

82 Bryman, A. (2007). Effective leadership in higher education: A literature review. Studies in Higher Education 32(6): 693–710.
83 Oakley, K. & Selwood, S. (2010). Conversations and Collaborations: The Leadership of Collaborative Projects between Higher Education and the Arts and Cultural Sector Final Report. London: Leadership Foundation for Higher Education.
84 Denis, J., Langley, A. & Sergi, V. (2012). Leadership in the plural. The Academy of Management Annals, 6(1): 211–83.
85 Konradt, U. & Hoch, J. (2007). A work roles and leadership functions of managers in virtual teams. International Journal of E-collaboration 3(3): 16–35.
86 Chrislip, D. & Larson, C. (1994). Collaborative Leadership. San Francisco: Jossey-Bass.
87 Knight, P. & Trowler, P. (2001). Departmental Leadership in Higher Education. London: McGraw-Hill Education.
88 Bryman, A. (2007). Effective leadership in higher education: A literature review. Studies in Higher Education 32(6): 693–710.
89 Gronn, P. (2002). Distributed leadership as a unit of analysis. The Leadership Quarterly 13(4): 423–51.
90 Konradt, U. (2014). Toward a theory of dispersed leadership in teams: Model, findings, and directions for future research. Leadership 10(3): 289–307.
91 Mayrowetz, D. (2008). Making sense of distributed leadership: Exploring the multiple usages of the concept in the field. Educational Administration Quarterly 44(3): 424–35.
92 Flinn, K. & Mowles, C. (2014). A complexity approach to leadership development: developing practical judgement. Stimulus Paper. London: Leadership Foundation for Higher Education.
93 Pedersen, D. & Hartley, J. (2008). The changing context of public leadership and management: implications for roles and dynamics. International Journal of Public Sector Management 21(4): 327–39.
94 Uhl-Bien, M., Marion, R. & McKelvey, B. (2007). Complexity leadership theory: Shifting leadership from the industrial age to the knowledge era. The Leadership Quarterly 18(4): 298–318.
95 Yip, J., Wong, S., & Ernst, C. (2008). The nexus effect: When leaders span boundaries. Leadership in Action 28: 4 San Francisco: Jossey-Bass.
96 Ernst, C. & Chrobot-Mason, D. (2010). Boundary spanning leadership: Six practices for solving problems, driving innovation, and transforming organizations. New York: McGraw-Hill Professional.
97 Pearce, C. (2004). The future of leadership: combining vertical and shared leadership to transform knowledge work. Academy of Management Executive 18: 47–57.
98 Rost, J. (1993). Leadership for the twenty-first century. np: Greenwood Publishing Group.
99 Wang, H., Law, K. S., Hackett, R. D., Wang, D. & Chen, Z. X. (2005). Leader–member exchange as a mediator of the relationship between transformational leadership and followers' performance and organizational citizenship behavior. Academy of Management Journal 48(3): 420–32.
100 Hughes, R., Ginnett, R. & Curphy, G. (1993). Leadership involves an interaction between the leader, the followers, and the situation. In Hughes, R.L.. Leadership: Enhancing the lessons of experience. Richard D. Irwin, Inc., 1333 Burridge Parkway, Burridge, IL 60521.
101 Gentle, P. & Forman, D. (2014). Engaging Leaders: the challenge of inspiring collective commitment in universities. London: Routledge.
102 Fletcher, J. (2004). The paradox of postheroic leadership: An essay on gender, power and transformational change. Leadership Quarterly 15: 647–61.
103 Giberson, T., Resick, C., Dickson, M., Mitchelson, J., Randall, K. & Clark, M. (2009). Leadership and organizational culture: Linking CEO characteristics to cultural values. Journal of Business and Psychology 24(2): 123–37.

Transformative and citizen leadership

Transformative or transformational leadership focuses on engaging followers, not merely activating them[104], combining needs and aspirations in a common enterprise and in the process making better citizens of both leaders and followers[105]. It can include informal leadership, social change/action-orientated leadership, role modelling, and leadership of ideas (opinion leadership, thought leadership)[106]. Important theories in this area are the citizen leader model[107] (eg, higher education as unbounded organisations, socially and economically embedded within society, communities and nations) and turnaround leadership for organisational change[108].

Community development/engagement

Community development/engagement is a theme of cross-enterprise leadership, which explores the influence of leadership in development activities, start-up or growth[109]. Leadership may be examined in studies of community engagement and public engagement, for example the role of higher education in leading communities and social change[110], or drawing on perspectives of socially responsible leadership[111].

Ethics, social identity and self-leadership

Leadership ethics[112] are explored in early understandings of servant/master leadership, where leadership can be coercive or devoid of values, or where there is no such thing as the common good. Studies have examined embodied authentic leadership[113], leaderful practices, and leadership-as-practice[114]. Research in this area has also explored the emotional labour of leadership[115]. Research with UK academics[116] proposes a social identity approach to academic leadership in higher education, whereby people are unlikely to be regarded as leaders unless they are perceived to be working on behalf of the group, helping to frame group identity, and putting in place structures and processes that further the interests of the group. Academic leadership is described as a process through which academic values and identities are constructed, promoted and maintained. This perspective can be contrasted with a whole host of activities conducted within institutions, and the sector more widely, to organise and allocate academic tasks and processes, which could be more accurately described as academic management. Together these processes create a sense of purpose and define objectives for individual academics that are operationalised through the process of self-leadership, which is characteristic of academic work. Self-leadership[117] could include, for example in higher education, studies of academic conduct, reflective practice or self-assessment.

104 Bass, B. & Riggio, R. (eds) (2006). Transformational Leadership. New York: Routledge.
105 Shields, C. (2010). Transformative leadership: Working for equity in diverse contexts. Educational Administration Quarterly 46(4): 558–89.
106 Pielstick, C. (2000). Formal vs. informal leading: A comparative analysis. Journal of Leadership & Organizational Studies 7(3): 99–114.
107 Langone, C. (2004). The use of a citizen leader model for teaching strategic leadership. Journal of Leadership Education, 3(1): 82–88.
108 Fullan, M. & Scott, G. (2009). Turnaround leadership for higher education. London: John Wiley & Sons.
109 Crossan, M. & Olivera, F. (2006). Cross-enterprise leadership: A new approach for the 21st century. Ivey Business Journal 70(5): 1–6.
110 Outcalt, C., Faris, S. & McMahon, N. (2001). Developing non-hierarchical leadership on campus: Case studies and best practices in higher education. np: Greenwood Publishing Group.
111 Dugan, J. (2006). Involvement and leadership: A descriptive analysis of socially responsible leadership. Journal of College Student Development 47(3): 335–43.
112 Ciulla, J. (2013). Leadership Ethics. Oxford: Blackwell Publishing Ltd.
113 Ladkin, D. & Taylor, S. (2010). Enacting the 'true self': Towards a theory of embodied authentic leadership. The Leadership Quarterly 21(1): 64–74
114 Raelin, J. (2011). From leadership-as-practice to leaderful practice. Leadership 7(2): 195–211.
115 Gardner, W., Fischer, D. & Hunt, J. (2009). Emotional labor and leadership: A threat to authenticity? The Leadership Quarterly 20(3): 466–82.
116 Bolden, R., Gosling, J., O'Brien, A., Peters, K., Ryan, M. & Haslam, S. (2012). Academic leadership: Changing conceptions, identities and experiences in UK higher education. London: Leadership Foundation for Higher Education.
117 Neck, C. & Houghton, J. (2006). Two decades of self-leadership theory and research: Past developments, present trends, and future possibilities. Journal of Managerial Psychology 21(4): 270–95.

Components of governance

The web-based searches identified the following components of governance.

Governance structures

Research on governance structures includes public or state governance, policy processes and law-making[118], for example in higher education government policies on tuition fees[119,120]. It includes private governance, such as rules or standards made by private or non-governmental organisations (eg, in higher education, governance frameworks)[121]. Governance structures could also include global governance, international agreements between independent states (eg, in higher education, European agreements on education[122]), non-profit governance (eg, exercise of authority by boards of trustees) or corporate governance, direction by boards and their laws or customs (eg, in higher education, university cultures of governance[123,124]). At a more local level, governance can include project governance, processes and outcome assurance.

Governance systems

Research on governance systems may include public management (eg, in higher education, steering patterns[125]), professional practice (eg, in higher education, research governance requirements), environmental governance (eg, land-use planning and building regulations), internet governance[126] or information technology governance (eg, data protection).

Processes of governance

Research on processes of governance includes organisational decision-making, and setting standards and requirements[127] (eg, in higher education, requirements for degree-awarding powers and international systems of assessment[128]). Studies have researched systems of assessment, quality monitoring and assurance[129] and systems of responsibility and accountability (eg, in higher education, accountability structures[130,131]). Research might focus on setting incentives and/or penalties for organisations or sectors[132].

Theory and models of governance

Theory-based research might explore perspectives of regulatory governance, decentralised or adaptive policymaking[133], participatory governance (eg, democratic engagement and public consultation), multi-level governance, interaction of levels of governance or authority structures, metagovernance (governance of governance, eg, codes of conduct for governors or collaborative governance), stakeholder empowerment and decision-making.

118 Bevir, M. (2013). Governance: A very short introduction. Oxford: Oxford University Press.
119 Amaral, A., Jones, G. & Karseth, B. (2002). Governing higher education: National perspectives on institutional governance (vol. 1). Berlin: Springer Science & Business Media.
120 Kaiser, F., Maassen, P., Meek, L., van Vught, F., de Weert, E. & Goedegebuure, L. (eds) (2014). Higher Education Policy: An International Comparative Perspective. London: Elsevier.
121 Huisman, J. (ed). (2009). International Perspectives on the Governance of Higher Education: Alternative Frameworks for Coordination. New York: Routledge.
122 van Vught, F. (ed). (2009). Mapping the higher education landscape: Towards a European classification of higher education (vol. 28). Berlin: Springer Science & Business Media.
123 Brennan, J., Fedrowitz, J., Huber, M. & Shah, T. (1999). What kind of university? International perspectives on knowledge, participation and governance. Buckinghamshire: Open University Press.
124 Middlehurst, R. (2012). Leadership and Management in Higher Education: A Research Perspective. Working Paper No. 2012/47. Maastrict School of Management.
125 Ferlie, E., Musselin, C. & Andresani, G. (2008). The steering of higher education systems: A public management perspective. Higher Education 56(3): 325–48.
126 Gayle, D., Tewarie, B. & White Jr, A. (2011). Governance in the twenty-first-century university: Approaches to effective leadership and strategic management: ASHE-ERIC Higher Education Report (vol. 14). London: John Wiley & Sons.
127 Hufty, M. (2011). Investigating policy processes: The Governance Analytical Framework (GAF), in Wiesmann, U., Hurni, H., et al (eds). Research for Sustainable Development: Foundations, Experiences, and Perspectives403–24. Bern: Geographica Bernensia.
128 Locke, W., Cummings, W. & Fisher, D. (eds). (2011). Changing governance and management in higher education: The perspectives of the academy (vol. 2). Berlin: Springer Science & Business Media.
129 Salter, B. & Tapper, T. (2000). The politics of governance in higher education: the case of quality assurance. Political Studies 48(1): 66–87.
130 Stensaker, B. & Harvey, L. (eds) (2011). Accountability in Higher Education: Global Perspectives on Trust and Power. London: Routledge.
131 Alexander, F. (2000). The changing face of accountability: Monitoring and assessing institutional performance in higher education. Journal of Higher Education 411–31.
132 Middlehurst, R. (2004). Changing internal governance: A discussion of leadership roles and management structures in UK universities. Higher Education Quarterly 58(4): 258–79.
133 Bargh, C., Scott, P. & Smith, D. (1996). Governing Universities. Changing the Culture? Bristol: Taylor & Francis.

Good governance

Research in the area of good governance may examine normative concepts of fair governance or good governance in different contexts[134]. It includes the study of rights and interests of clients, stakeholders or citizens (eg, in higher education, civic engagement and democracy[135,136]).

Components of management

Web-based searches were again used to identify components of management. The following themes were identified.

Business, economics and finance

Management research includes studies of business monitoring, measurement or reporting[137]. It can include development, implementation and evaluation of financial audit, accounting and reporting systems[138]. Studies in this area may include research on fund-raising or charitable funding[139].

Corporate responsibility and sustainability

Research in this area could include management strategies for ensuring corporate responsibility[140], sustainability and ethical practices[141]. Important theoretical perspectives include global ethics[142] and multinational corporate management.

Entrepreneurship and business growth

This area of research can include entrepreneurship in the business or management functions of organisations[143] and the exploration of new or opportunistic markets, eg, in higher education, internationalisation of student recruitment[144] or bespoke programme development in response to identified training needs.

Information systems

Management research can include the development, application or testing of information technology, including web services[145]. It can also focus on internal communication systems[146] or external public relations and communication systems[147].

Innovation and knowledge

Management research can include the management of innovation or knowledge through network management or communities of practice[148]. Important perspectives include knowledge management systems[149], knowledge-transfer and knowledge sharing, intellectual capital[150]. Innovation can include implementation and evaluation of improvement initiatives, such as total quality management[151].

134 Shattock, M. (2008). Managing good governance in higher education. Buckinghamshire: Open University Press.
135 McIlrath, L. & MacLabhrainn, I. (eds) (2007). Higher education and civic engagement: International perspectives. Ashgate Publishing Ltd.
136 De Groof, J., Neave, G. & Švec, J. (eds) (1998). Democracy and governance in higher education (vol. 2). np: Martinus Nijhoff Publishers.
137 Ittner, C. & Larcker, D. (1998). Innovations in performance measurement: trends and research implications. Journal of Management Accounting Research 10: 205.
138 Menon, K. & Williams, J. (1994). The use of audit committees for monitoring. Journal of Accounting and Public Policy 13(2): 121–39.
139 Kelly, K. (2012). Effective Fund-raising Management. London: Routledge.
140 Waddock, S., Bodwell, C. & Graves, S. (2002). Responsibility: The new business imperative. The Academy of Management Executive 16(2): 132–48.
141 Carroll, A. & Buchholtz, A. (2014). Business and society: Ethics, sustainability, and stakeholder management. np: Cengage Learning.
142 Buller, P., Kohls, J. & Anderson, K. (1991). The challenge of global ethics. Journal of Business Ethics 10(10): 767–75.
143 Shane, S. & Venkataraman, S. (2000). The promise of entrepreneurship as a field of research. Academy of Management Review 25(1): 217–26.
144 Haveman, H. (1993). Follow the leader: Mimetic isomorphism and entry into new markets. Administrative Science Quarterly 593–627.
145 Leymann, F., Roller, D., & Schmidt, M. (2002). Web services and business process management. IBM Systems Journal 41(2): 198–211.
146 Ridder, J. (2004). Organisational communication and supportive employees. Human Resource Management Journal 14(3): 20–30.
147 Grunig, J. (2013). Excellence in Public Relations and Communication Management. London: Routledge.
148 Agranoff, R. & McGuire, M. (2001). Big questions in public network management research. Journal of Public Administration Research and Theory 11(3): 295–26.
149 Rubenstein-Montano, B., Liebowitz, J., Buchwalter, J., McCaw, D., Newman, B., Rebeck, K. & Team, T. (2001). A systems thinking framework for knowledge management. Decision Support Systems 31(1): 5–16.
150 Guthrie, J. (2001). The management, measurement and the reporting of intellectual capital. Journal of Intellectual Capital 2(1): 27–41.
151 Oakland, J. (2003). Total quality management: Text with cases. London: Routledge.

Managing people and careers

Research focusing on managing people and careers might include staff recruitment and retention[152]. Important perspectives include human resource management, work–life balance, equality and diversity[153]. It can include management of strategic and operational control or line management, eg, in higher education, research on new managerialism[154] or decision support systems for managing staff[155]. It may also include studies of client support services, eg, in higher education, management of distance learning[156].

Marketing, sales and client relationships

Management research could include studies of internationalisation and globalisation[157], including client recruitment (eg, in higher education student selection, offers and enrolment[158]). It may include studies of marketing and sales (eg, in higher education, marketing of degree pathways or commissioned courses[159].

Programme and project management

Research on programme management (eg, in higher education, evaluation of curriculum management[160]) and research on project management[161] (eg, in higher education, evaluation of course management or programmes of research).

Business performance

Research in this area might focus on business performance management or the performance of associated governing bodies[162]. It could include the study of managerial approaches, styles, practices and strategies to encourage productivity or performance (eg, in higher education , strategies for increasing research productivity[163]). It could include research on risk management[164], service quality improvement (eg, in higher education, importance-performance analysis[165]) and client feedback (eg, in higher education, student satisfaction[166]).

Strategy, complexity and change management

Research may focus on strategy, complexity or creativity[167] of management approaches. It could include managerial initiatives to improve working conditions, processes or practices (eg, in higher education, employee satisfaction with pay and promotion[168]). Strategic leadership or management of organisational development may be described as strategic change, cultural change or systems change[169].

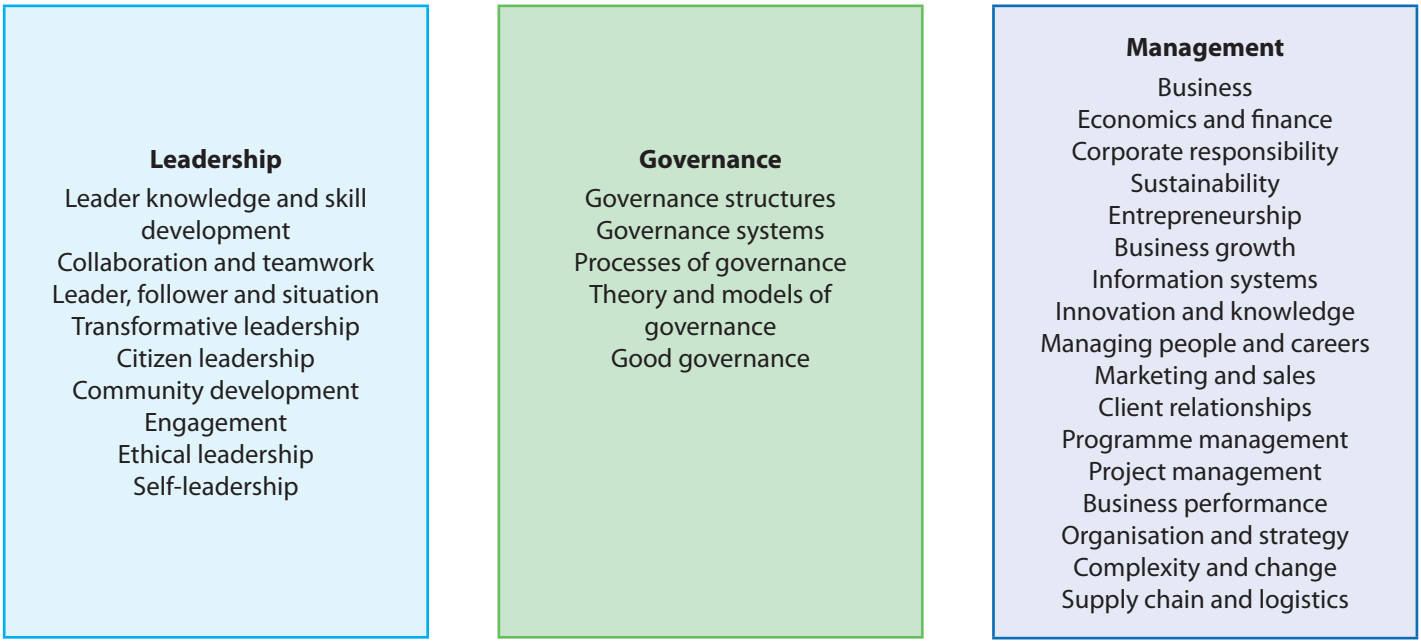
152 Larson, S., Lakin, K., Bruininks, R. & Braddock, D. (1998). Staff recruitment and retention: Study results and intervention strategies. AAMR.
153 Bratton, J. & Gold, J. (2012). Human resource management: theory and practice. np: Palgrave Macmillan.
154 Deem, R., Hillyard, S. & Reed, M. (2007). Knowledge, higher education, and the new managerialism: The changing management of UK universities. Oxford: Oxford University Press.
155 Arnott, D. & Pervan, G. (2005). A critical analysis of decision support systems research. Journal of Information Technology 20(2): 67–87.
156 Sewart, D. (1993). Student support systems in distance education. Open Learning 8(3): 3–12.
157 Kudrle, R. (1999). Three types of globalization: communication, market, and direct. Globalization and Global Governance 3–25.
158 Bolsmann, C. & Miller, H. (2008). International student recruitment to universities in England: discourse, rationales and globalisation. Globalisation, Societies and Education 6(1): 75–88.
159 Hemsley-Brown, J. & Oplatka, I. (2006). Universities in a competitive global marketplace: A systematic review of the literature on higher education marketing. International Journal of Public Sector Management, 19(4) 316–38.
160 Glatthorn, A., Boschee, F. & Whitehead, B. (2005). Curriculum Leadership: Development and Implementation. Thousand Oaks, CA: Sage Publications.
161 Turner, J. (2014). The handbook of project-based management (vol. 92). London: McGraw-Hill.
162 Osborne, S. P., Bovaird, T., Martin, S., Tricker, M. & Waterston, P. (1995). Performance management and accountability in complex public programmes. Financial Accountability & Management 11(1): 19–37.
163 Dundar, H., & Lewis, D. (1998). Determinants of research productivity in higher education. Research in Higher Education 39(6): 607–31.
164 Power, M. (2008). Organized uncertainty: Designing a world of risk management. Oxford: Oxford University Press.
165 O'Neill, M. & Palmer, A. (2004). Importance-performance analysis: a useful tool for directing continuous quality improvement in higher education. Quality Assurance in Education 12(1): 39–52.
166 Douglas, J., Douglas, A. & Barnes, B. (2006). Measuring student satisfaction at a UK university. Quality Assurance in Education 14(3): 251–67.
167 Stacey, R. (2007). Strategic management and organisational dynamics: The challenge of complexity to ways of thinking about organisations. London: Pearson Education.
168 Chen, S., Yang, C., Shiau, J. & Wang, H. (2006). The development of an employee satisfaction model for higher education. The TQM Magazine 18(5): 484–500.
169 Bolden, R. (2010). Leadership, management and organisational development, in Gold, J., Thorpe, R. & Mumford, A. (eds) Gower Handbook of Leadership and Management Development. Farnham: Gower.

Supply chain and logistics

Management research might include studies of supply chain management, procurement, contracting, hire, purchasing[170] or logistics management[171].

Figure 3 illustrates themes of the research literature that have been drawn together here to outline the scope of the LGM research field. The resulting conceptualisation of the LGM field informed the search strategy.

Figure 3: Components of the LGM field



2.2 Research impact as a Complex Adaptive System

Research impact has been described quite extensively in other places, for example in relation to research assessment[172], research-council-funded research[173], the social sciences[174] and health research[175]. The contribution of this report is research impact in the context of LGM.

Similarly, models of research impact have been discussed in detail elsewhere, including:

- critique of traditional linear logic models of research impact[176,177]
- models of dissemination that seek to bridge the gap between research outputs and those who might benefit from them[178,179,180]
- models of research/user interaction[181]

170 Seuring, S. & Müller, M. (2008). From a literature review to a conceptual framework for sustainable supply chain management. Journal of Cleaner Production 16(15): 1699–710.
171 Bowersox, D., Closs, D. & Helferich, O. (1996). Logistical Management (vol. 6). New York: McGraw-Hill.
172 REF (2011b). Research Excellence Framework 2014. Assessment framework and guidance on submissions. July 2011.
173 RCUK (2015). Research Councils UK. Pathways to Impact. http://www.rcuk.ac.uk/innovation/impacts/
174 London School of Economics Public Policy Group (2011). Maximising the impacts of your research: A handbook for social scientists. London: LSE 1–298.
175 Greenhalgh, T. & Fahy, N. (2015). Research impact in the community–based health sciences: an analysis of 162 case studies from the 2014 UK Research Excellence Framework. BMC Medicine 13: 232.
176 Penfield, T., Baker, M., Scoble, R. & Wykes, M. (2014). Assessment, evaluations, and definitions of research impact: a review. Research Evaluation 23(1): 21–32.
177 Milat, A., Bauman, A. & Redman, S. (2015). A narrative review of research impact assessment models and methods. Health Res Policy Syst 13: 18.
178 Knott, J. & Wildavsky, A. (1980). If dissemination is the solution, what is the problem? Knowledge: Creation, Diffusion, Utilization 1(4): 537–78.
179 Davies, H., Nutley, S. & Walter, I. (2008). Why 'knowledge–transfer' is misconceived for applied social research. J Health Serv Res Policy. 13: 188–90.
180 Meagher, L., Lyall, C. & Nutley, S. (2008). Flows of knowledge, expertise and influence: a method for assessing policy and practice impacts from social science research. Res Eval 17: 163–73.
181 Lavis, J., Ross, S., McLeod, C. & Gildiner, A. (2003). Measuring the impact of health research. Journal of Health Services Research & Policy 8: 165–70.

- models of diffusion of innovation[182]
- models of knowledge-transfer to support collaborations[183]
- frameworks for assessing a range of impacts in a disciplinary area[184,185]
- economic models of return on investment[186]
- Payback Framework[187].

Newer modes of knowledge production – characterised by reflexivity, transdisciplinarity and heterogeneity – connect with the changing role of knowledge in social relations[188]. In Participatory Action Research (PAR) studies, the users of the research are the community that set the agenda and lead the research process. In this model, academics offer a space where it is safe for research users to question their fundamental assumptions and stimulate research-led debate to inform change. From this perspective, research impact is about facilitating the user community to challenge normalised views and routines.

As a consequence of newer, system-based models of research impact, there has been a shift in thinking away from linearity models of research production to the conditions of knowledge mobilisation[189]. The result has been investment in multi-stakeholder research collaborations such as UK National Institute for Health Research Collaborations for Leadership in Applied Health Research and Care, which are built on non-linear models of applied research[190].

Going forward there is a need to build on current definitions and models of research impact to understand the nature and scope of research impact in different fields, such as LGM research. An idea explored and developed in this report is how the notion of Complex Adaptive Systems (CAS) can inform LGM research impact.

Complex Adaptive Systems thinking is an approach that challenges simple cause and effect assumptions associated with research impact and instead sees systems as a dynamic process where the interactions and relationships of different components simultaneously affect and are shaped by the system[191,192]. In such a perspective, research impact is considered both a complex whole, and as comprising interrelated yet discrete processes[193]. Characteristics of complex adaptive systems are non-linearity, dynamic behaviour, emergence and self-organisation[194].

182 Greenhalgh, T., Robert, G., Macfarlane, F., Bate, P., Kyriakidou, O. & Peacock, R. (2005). Storylines of research in diffusion of innovation: a meta–narrative approach to systematic review. Social Science & Medicine 61(2): 417–30.
183 Davies, H., Nutley, S. & Walter, I. (2008). Why 'knowledge-transfer' is misconceived for applied social research. J Health Serv Res Policy 13: 188–90.
184 Kuruvilla, S., Mays, N. & Walt, G. (2007). Describing the impact of health services and policy research. J Health Serv Res Policy. 12 Suppl 1: S1. 23–31.
185 Banzi, R., Moja, L., Pistotti, V., Facchini, A. & Liberati, A. (2011). Conceptual frameworks and empirical approaches used to assess the impact of health research: an overview of reviews. Health Res Policy Syst 9: 26.
186 Deloitte Access Economics (2012). Extrapolated returns on investment in NHMRC medical research. Canberra: Australian Society for Medical Research.
187 Buxton, M. & Hanney, S. (1996). How can payback from health services research be assessed? J Health Serv Res Policy 1: 35–43.
188 Gibbons, M., Limoges, C., Nowotny, H., Schwartzman, S., Scott, P. & Trow, M. (1994). The new production of knowledge: The dynamics of science and research in contemporary societies: Thousand Oaks, CA: Sage.
189 Walshe, K. & Davies, H. (2013). Health research, development and innovation in England from 1988 to 2013: from research production to knowledge mobilization. J Health Serv Res Policy 18: 1–12.
190 Cooke, J. (2005). A framework to evaluate research capacity building in health care. BMC Family Practice6: 44.
191 Holland, J. (1999). Emergence: from chaos to order. Reading, Mass: Perseus Books.
192 Dodder, R. & Dare, R. (2000). Complex Adaptive Systems and Complexity Theory: Inter-related Knowledge Domains. Massachusetts: Massachusetts Institute of Technology.
193 Holland, J. (1999). Emergence: from chaos to order. Reading, Mass: Perseus Books.
194 Harkema, S. (2003). A complex adaptive perspective on learning within innovation projects. Learning Organization 10(6): 340–46.

Over the past decade or so, CAS thinking has started to be used more extensively in different fields of research, for example in healthcare[195], education[196,197] organisational[198,199,200] and leadership research[201,202,203]. In a Complex Adaptive System, the components or processes are interdependent and linked to wider contexts such as policy, social or economic climate[204]. These studies show a shift in thinking away from linear logic perspectives of research impact to more complex systems perspectives of research impact.

Complex Adaptive Systems operate under far from equilibrium conditions. They evolve and their past history contributes to their present formation[205]. People in the system may be ignorant of the behaviour of the system as a whole, responding only to the information or physical stimuli available to them locally[206]. Considering LGM research impact using CAS thinking raises a lot of interesting questions about the interplay of research processes, impact processes and research outcomes.

Issues explored in this study included the following:

- independence versus integration, which could be felt as a potential division of research efforts between strategising impact and research practice
- individualisation versus unity, for example the consequences of turning research impact into a series of tasks to maximise impact
- competition versus cooperation, such as the potential focusing of research community efforts on claiming research impact rather than cooperating on research studies
- cause versus effect, or how research outputs are used to cause particular types of impact, versus the effect of different types of research outcomes.

Complex Adaptive Systems thinking could help to examine the multitude of interrelated components that contribute to research impact. Table 2 provides a description of such a perspective, in contrast to a linear logic perspective.

195 Minas, H. (2005). Leadership for change in complex systems. Australas Psychiatry 13(1): 33–9.
196 Keshavarz, N., Nutbeam, D., Rowling, L. & Khavarpour, F. (2010). Schools as social complex adaptive systems: a new way to understand the challenges of introducing the health promoting schools concept. Soc Sci Med 70 (10): 1467–74.
197 Glatter, R. (2006). Leadership and organization in education: time for a re-orientation? Sch Leader Manage 26(1): 69–83.
198 Palmberg, K. (2009). Complex adaptive systems as metaphors for organizational management. Learning Organization 16(6): 483–98.
199 Brown, C. (2008). The use of complex adaptive systems as a generative metaphor in an action research: study of an organisation. Qual Report 13(3): 416–31.
200 McDaniel, R. (2007). Management strategies for complex adaptive systems: sensemaking, learning, and improvisation. Perform Imp Quart 20(2): 21–41.
201 Flinn, K. & Mowles, C. (2014). A complexity approach to leadership development: developing practical judgement. Stimulus Paper. London: Leadership Foundation for Higher Education.
202 Chadwick, M. (2010). Creating order out of chaos: a leadership approach. AORN J 91(1):154–70.
203 Burns, J. (2001). Complexity science and leadership in healthcare. J Nurs Adm 31(10):474–82.
204 Harkema, S. (2003). A complex adaptive perspective on learning within innovation projects. Learning Organization, 10(6): 340–46.
205 Holland, J. (1999). Emergence: from chaos to order. Reading, Mass: Perseus Books.
206 Keshavarz, N., Nutbeam, D., Rowling, L. & Khavarpour, F. (2010). Schools as social complex adaptive systems: a new way to understand the challenges of introducing the health promoting schools concept. Soc Sci Med 70(10): 1467–74.

Table 2: Comparison of linear and system perspectives of research impact

Characteristics	Linear logic perspective	Complex Adaptive System perspective
Explanatory similes	Mechanistic 'pipeline' (if we produce A it will lead to B) Predictive 'pathways' to impact (if we do A we will get to B) Retrospective 'stories' of the journey to impact (we did A and B occurred)	'Adaptive system' made up of processes that change and can be adapted Research impact is interrelated with research contexts, which can enable 'contextual leverage' The adaptive system has 'hidden and emergent properties' – impact cannot be predicted or fully accounted for
View of the relationship between research and impact	Impact is linked (flows from) research outcomes	Impact can predate research outcomes because impact may emerge at any point or place in the research impact system
View of researcher actions	Emphasis on researcher influence: authority, expertise, platforms for impact	Emphasis on researcher understanding and use of research impact system
View of beneficiaries	Beneficiaries are those who benefit from the research outcomes	Beneficiaries include different groups: stakeholders, researchers (and collaborators), research users, and end-users (public/users)
View of research outputs	Focus on describing and referencing discrete research outputs, evidence or products	Focus on evidencing types of impact (research use and effect) at different levels of impact
Focus of impact reporting	Defining funding and methods of underpinning research and research outputs	Describing types of impact, levels of impact and the processes and mechanisms through which they occurred

2.3 Perspectives of research impact

To explore different perspectives of research impact in relation to LGM research, a theoretical framework was developed from the research impact literature (Figure 4). The framework incorporates concepts of research impact concerning both the outcomes and processes of research impact as follows.

Types of impact (outcomes)

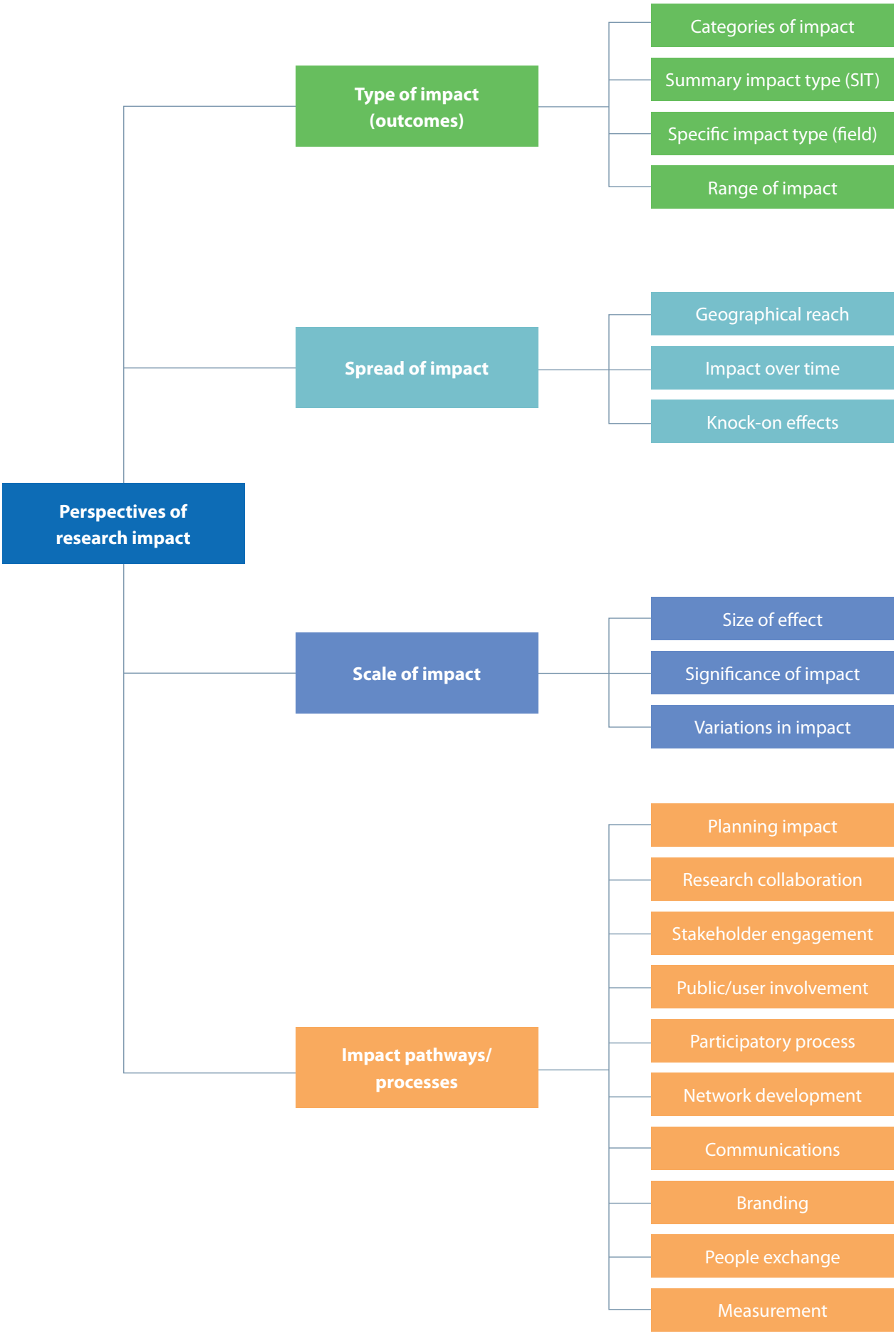
Categories of impact. A way of categorising types of research impact[207] is: (i) instrumental impact – influencing the development of policy, practice or service provision, shaping legislation or altering behaviour; (ii) conceptual impact – contributing to the understanding of issues, reframing debates; and (iii) capacity building – through technical, methodological and skills development. In this study, these theorised categories of impact informed the approach to searching for identifiable research outputs from LGM research. The resultant categories – research evidence, research products or novel ideas – presented a useful way of considering tangible, 'hard' outcomes such as journal articles and also more 'soft' outcomes such as changes in attitude or opinion.

Summary impact type (SIT): The REF database has its own classification system to enable searching whereby each case study is tagged with a SIT (political, legal, health, cultural, technological, societal, economic and environmental). In the present study, SIT categories were useful for initially considering the general types of outcomes that may be present in the LGM data.

Specific impact type (LGM). In the present study, the focus was on identifying specific types of impact associated with LGM research. This objective involved looking at outcomes of LGM impact case studies and using thematic analysis of sections on summary of impact to develop a classification of outcomes. The resulting SIT-LGM themes identified across the whole of the included case studies are shown in Annex 2. These themes were subsequently used to inform the classification of four types of LGM research (type I to type IV).

207 Nutley, S. & Walter, I. (2005). Assessing the impact of social science research: conceptual, methodological and practical issues. Research Unit for Research Utilisation School of Management, University of St Andrews.

Figure 4: Perspectives of research impact



Range of impact. The concept of range was used in 2014 REF to judge research impact[208]. The concept of range refers the different types of beneficiaries of the research. In the present study, the concept of range was useful for exploring who benefits from LGM research. It included considering (i) the range of beneficiaries, for example: academic, public sector, business/industry, third sector (voluntary, charity or social enterprise), general public, schools, or others; (ii) the range of types of people, eg in higher education, boards, leaders or managers, employees/staff groups, women, students, community members, council members, members of charities, or the general public; and (iii) the range of impact across different sectors or disciplines.

Spread

A number of perspectives of spread of impact informed the framework.

Geographical reach. The concept of geographical reach was useful for considering the local impact of LGM research on organisations or communities, and the national impact and international impact. In the present study this perspective was used in the analysis of spread of impact within a subsample of 20 case studies relating to impact in higher education sector.

Impact over time. Another perspective of spread used in this study was impact over time. This was useful for considering timescales to impact from LGM research. This concept was employed in the analysis of the subsample of higher education case studies.

Knock-on effects. The concept of knock-on effects describes consequential or unforeseen effects of research beyond the immediate impact on predicted beneficiaries. This was a useful perspective for considering the complex trajectories of LGM research. The concept emphasises that research impact can be unplanned and unpredictable, which helps to address the limitations of linear notions of how impact is achieved. However, the concept was less useful in the analysis because of the problem of 'tracking back' to determine whether outcomes were knock-on effects or whether they had been planned and foreseen. This concept may be more useful for researchers who are 'tracking forward' to capture research outcomes as they occur.

Scale of impact

A number of concepts were used to explore the scale of LGM research impact.

Size of effect. Size of effect describes the number of beneficiaries involved. This concept is useful for making judgements about the scale of impact of research outcomes. In the present study it was difficult to draw general conclusions about size of effect because of the heterogeneity of LGM research and the diversity of beneficiaries involved. Size of effect is a more useful concept for looking at relative effect of impact from comparable studies.

Significance of impact. A further concept used to explore the scale of impact in 2014 REF was significance[209]. This concept can describe claims to social significance, degree of change or beneficiaries' perspectives of gain or effect. Significance is a useful concept for exploring value positions and judgements about the importance of research outcomes. In the present study, significance was used to examine the views of case study authors about the significance of the impact described. The concept was used in the critical analysis of claims to impact.

Variations in impact. The concept of variations in impact was useful for thinking about impact, not as a consistent outcome but as outcomes within research contexts. This perspective can include (i) the locus or conditions of greatest impact; (ii) the evenness of impact achieved in different parts of a system and (iii) partiality or selective uptake or diffusion across a field or system. Variations in impact could be a useful concept for exploring 'impact hot spots' or who benefits from LGM research and why.

Impact processes/pathways

Impact planning. An objective of the study (objective 5) was to use the concept of pathways to impact to examine how impact was promulgated. Perspectives of pathways to impact explored in the present study include the recent Research Councils United Kingdom (RCUK) pathways to impact review[210] and the Economic and Social Research Council (ESRC) impact toolkit[211]. These frameworks suggest different ways in which impact might be delivered through the life of a research study.

208 REF (2011a). Research Excellence Framework 2014. Decisions for assessing research impact http://www.ref.ac.uk/media/ref/content/pub/decisionsonassessingresearchimpact/01_11.pdf

209 ibid

210 http://www.rcuk.ac.uk/innovation/impacts/

211 http://www.esrc.ac.uk/funding-and-guidance/impact-toolkit/

According to the RCUK Pathways to Impact review[212], researchers should be encouraged to:

- identify and actively engage relevant users of research and stakeholders at appropriate stages
- articulate a clear understanding of the context and needs of users and consider ways for the proposed research to meet these needs or impact upon understandings of these needs
- outline the planning and management of associated activities, including timing, personnel, skills, budget, deliverables and feasibility
- include evidence of any existing engagement with relevant end-users.
- A clearly thought through and acceptable Pathways to Impact statement is an essential component of research proposals and a condition of RCUK funding.

The ESRC framework identifies a number of key factors as being vital for generating impact. These include:

- established networks and relationships with research users involving users at all stages of the research
- well-planned public engagement and knowledge-exchange strategies
- good understanding of policy/practice contexts; portfolios of research activity that build up reputations with research users
- excellent infrastructure, and leadership and management support
- where appropriate, the involvement of intermediaries and knowledge brokers as translators, amplifiers and network providers.

These factors relate to the process of generating impact, the context in which research messages are delivered and the content of research.

As a consequence of these advances in research commissioning, there is increased emphasis on impact planning at the research proposal stage. The challenge is to understand effective approaches to maximising research impact in different contexts, rather than simply defining a generic set of impact steps.

Routes to impact. To explore process perspectives of research impact, this study used the concept of routes to research impact. The term was used to mean the steps, strategies or processes[213,214] that can lead to research impact. The term 'routes to impact' is used differently to 'pathways to impact' to emphasise that work is needed to uncover, describe and strengthen routes to research impact; to inform strategic or set pathways that researchers should follow. The concept is used in Chapter 4 of this report to describe routes that researchers and research institutions have taken to move towards a more strategic position or supportive conditions for research impact.

2.4 Processes of interaction between researchers and non-academic groups

This section describes key concepts used in this study to examine processes of interaction between researchers and non-academic groups. Such interactions are widely recognised in the research literature as contributing to research impact. Unfortunately the terminology used to describe interactions is complex and it can be unclear who was actually involved and the nature of the interaction with researchers. The term 'non-academic people' covers diverse groups of lay and professional people and should not be taken as meaning people who are any less qualified, experienced or knowledgeable than researchers. Current understanding is further limited by a lack of language to adequately describe the different positions and roles of diverse groups of people in relation to a dynamic concept such as research or research impact. The situation is also complicated by the different types of processes of interaction that are being described, such as collaboration, engagement or involvement in the research.

212 RCUK (2015). Research Councils UK. Pathways to Impact. http://www.rcuk.ac.uk/innovation/impacts/

213 Learmonth, M., Lockett, A. & Dowd, K. (2012). Promoting scholarship that matters: the uselessness of useful research and the usefulness of useless research. Brit J Management 23: 35.

214 Greenhalgh, T. (2015). We must do more to tell the full story of impact. Times Higher Education 1 October 2015.

Research collaboration

The concepts of collaborators and collaboration are ubiquitous within LGM research and are strongly associated with concepts of research impact[215,216]. LGM research often involves multidisciplinary research teams and industry, voluntary sector or service provider partners[217] who may be referred to as collaborators. While collaboration is used to describe research approaches that value the exchange of knowledge and expertise[218]. In this study, the concept of collaborators was used to refer to partnerships in the research, which could include multi-university or multidisciplinary research collaborations as well as academic/non-academic collaborations. Alternative terms used by case study authors to describe collaboration were partnership working with research partners or industry partners.

Stakeholder engagement

In the research literature, the term 'stakeholder' is generally used to mean the individuals or groups whom researchers believe have a stake in the research or will make use of the research outputs. The term is often used in an unhelpfully broad sense in relation to research impact to mean the involvement of any non-academic groups in the research. In this study, the term 'stakeholders' is used differently. It is used to mean the people directly influencing or involved in the research, for example policymakers, commissioners, regulators or assessors of the research. Stakeholders differ from research users because they have a different – direct and influencing – relationship to the research. Approaches to LGM research are now more likely to engage with stakeholders in the real world outside academic settings[219] using applied, translational or knowledge-transfer approaches[220,221,222,223,224,225]. However, stakeholders can also be research users.

Productive interactions with research users

The concept of the research user is used in this study to mean people who use, or may use in the future, research outputs, for example policymakers, service providers, leaders, managers, educators or practitioners. Research users' use of research outputs could include use of evidence, products or novel ideas. Research users may also disregard, contest or fail to implement research outputs in the way researchers intended them to be adopted. Previous authors have written extensively about how research impact is affected by the intentions of the research user[226,227,228]. For example, research users may use evidence for instrumental gain, tactical advantage, enlightenment, or the greater public good[229]. LGM research users may be subtly or indirectly influenced by diffusion of ideas through organisational networks rather than through more obvious direct links to LGM research or researchers. The consequence for LGM research, and this study, is a need to understand who LGM research users are and to interact with research users in ways that maximise research impact.

215 Sooho, L. & Bozeman, B. (2005). The impact of research collaboration on scientific productivity. Social Studies of Science 35 (5): 673–702.
216 Oakley, K. & Selwood, S. (2010). Conversations and Collaborations: The Leadership of Collaborative Projects between Higher Education and the Arts and Cultural Sector Final Report. London: Leadership Foundation for Higher Education.
217 Jones, B. F., Wuchty, S. & Uzzi, B. (2008). Multi-university research teams: shifting impact, geography, and stratification in science. Science 322(5905): 1259–62.
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221 Gagnon, M. L. (2011). Moving knowledge to action through dissemination and exchange. Journal of Clinical Epidemiology 64(1): 25–31.
222 Davies, H., Nutley, S. & Walter, I. (2008). Why 'knowledge–transfer' is misconceived for applied social research. J Health Serv Res Policy 13: 188–90.
223 Cooke, J. (2005). A framework to evaluate research capacity building in health care. BMC Family Practice 6: 44.
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226 Bratton, J. & Gold, J. (2012). Human resource management: theory and practice. London: Palgrave Macmillan.
227 Boswell, C. (2009). The political uses of expert knowledge: immigration policy and social research. Cambridge: Cambridge University Press.
228 Davies, H., Nutley, S. & Walter, I. (2008). Why 'knowledge–transfer' is misconceived for applied social research. J Health Serv Res Policy 13: 188–90.
229 Weiss C. (1979). The many meanings of research utilization. Public Administration Review 39(5): 426–31.

The associated concept of productive interactions has been developed and applied to understand the social impact of research[230,231]. Productive interactions assume that for impact to occur, a contact between researchers and research users must have taken place. When this interaction leads to an effort by the research user to engage with the research, or to do new things, or to do things differently, the research has had an impact. The concept of research users and productive interactions was used in the present study to explore researchers' perspectives of whom it was advantageous to work with in the research to achieve research impact.

Public/user involvement

A specific objective of this study was to explore the nature of public/user involvement in LGM research, particularly in relation to how this might enable research impact. The concept of 'public/user involvement in research' describes practices to actively involve end-users or members of the public in the research process itself[232]. This contrasts with situations where the public or end-users are considered to be the passive subjects of research.

Public/user involvement in research is based on the idea that people who might be affected by research should have a say in how such research is commissioned, designed, undertaken and evaluated[233]. The related concept of citizen engagement has been widely debated in political and social decision-making[234], but the usefulness of this concept in relation to LGM research is limited by its focus on formally recognised groups who can be classified as citizens. Instead, LGM research often concerns issues about much wider population groups such as the governance of international communities, leadership of multinational organisations, or the management of refugee communities.

Although 2014 REF took pioneering steps to involve users in the research assessment process[235], guidance for reporting of impact in 2014 REF did not require or prompt researchers to provide information about public/user involvement in the research. Instead the emphasis was on showing any impact of the research on the public (for example changes in public awareness, attitudes, understanding or behaviour) rather than showing public/user influence on the research.

Public/user involvement in research is now seen as an essential part of many research fields and disciplines. In health and social care research, public and patient involvement (PPI) is a requirement of all publicly funded research, such as research funded under the umbrella of the National Institute for Health Research[236]. This is largely due to research commissioners' requirements for researchers to show their commitment to actively involving patients or the public in the research process, but research may also be user-led, initiated and undertaken by users[237]. In social policy and social work research, user or client involvement aligns with moves towards research that values social inclusion and social justice, and research to address the needs of excluded or minority groups[238]. Research governance and ethics frameworks in health and social care support these requirements.

In education research, involving end-users such as students or parents in the research process might be seen as a way of orientating teaching towards improved methods of student learning[239]. In higher education, student involvement has been increasingly integrated into the strategies, governance and accountability requirements for external regulation[240]. New arrangements for higher education funding mean that the active involvement of students at all levels of university development and decision-making will become even more important in the future[241].

230 Molas-Gallart, J. & Tang, P. (2011). Tracing 'productive interactions' to identify social impacts: an example from the social sciences. Research Evaluation 20(3): 219–26.
231 Spaapen, J. B.& Drooge, L. (2011). Introducing productive interactions in social impact assessment. Research Evaluation 20(3): 211–18.
232 Staley, K. (2009). Exploring Impact: Public involvement in NHS, public health and social care research. Eastleigh: INVOLVE.
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234 Taylor, D. (2005). Governing through evidence: participation and power in policy evaluation. Journal of Social Policy 34(4): 601–18.
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236 Staley, K. (2009). Exploring Impact: Public involvement in NHS, public health and social care research. Eastleigh: INVOLVE.
237 Beresford, P. (2005). Developing the theoretical basis for service user/survivor-led research and equal involvement in research. Epidemiologia e Psichiatria Sociale 14(1): 4–9.
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239 Felton, A. & Stickley, T. (2004) Pedagogy, power and service user involvement. Journal of Psychiatric and Mental Health Nursing 11(1): 89–98.
240 Salter, B. & Tapper, T. (2000) The politics of governance in higher education: the case of quality assurance. Political Studies 48(1): 66–87.
241 BIS (2015). Fulfilling our potential: Teaching excellence, Social mobility, and Student Choice. Green Paper. London: Department for Business, Innovation and Skills.

As a concept, public/user involvement takes on different characteristics when it is applied in different research contexts. In LGM research, contexts involving the public or end-users of service organisations might be viewed as a way of developing research that enables organisations to respond to customer, client or public needs[242], while in business or management research, involving end-users might be viewed as an extension of market research for the purpose of developing research that enables companies to respond to customer needs[243].

Public/user involvement in research is likely to be a significant contributing factor to research impact. However, the evidence is difficult to establish because the way in which it is undertaken in research varies hugely, from no involvement at all, to user-led research studies designed and undertaken by end-users themselves[244]. Diverse groups of the public/users might be selected and recruited to research studies and involved in defining research aims or working with researchers, for example as 'user researchers' or 'peer researchers'. Issues about the process and impact of public/user involvement in research are developing fields for research[245].

Mechanisms

The concept of mechanisms is an emerging concept in the research impact literature[246] and it is important to current thinking about impact pathways. In this study, mechanisms are perceived to be events or actions to support productive interactions between researchers and non-academic people or groups in the research process. Mechanisms may exist for the purpose of informing a specific study, programme, organisation or area of research. Therefore mechanisms may link researchers and stakeholders, both in and out of research studies, to enable exchange of knowledge between the research and the wider research context. Researchers can intentionally plan or use mechanisms within the research design to enhance research impact. In this study, the concept of mechanisms provided a clear focal point to reflect on the importance of the places, methods and conditions for interaction between researchers and other groups.

242 Mittal, B. & Lee, M. (1989) A causal model of consumer involvement. Journal of Economic Psychology 10(3): 363–89.

243 ibid

244 Morrow, E., Ross, F., Grocott, P. & Bennett, J. (2010). A model and measure for quality service user involvement in health research. International Journal of Consumer Studies 34(5): 532–9.

245 Shippee, N., Domecq Garces, J., Prutsky Lopez, G. et al (2015). Patient and service user engagement in research: a systematic review and synthesized framework. Health Expectations 18(5): 1151–66.

246 Greenhalgh, T. & Fahy, N. (2015). Research impact in the community-based health sciences: an analysis of 162 case studies from the 2014 UK Research Excellence Framework. BMC Medicine 13: 232.

Key learning points

- To identify a valid sample of impact case studies, a conceptualisation of LGM research was derived from themes in the literature on leadership, governance and management research. This conceptualisation could be used to inform future LGM research and development work, not only on research impact.
- Previous research on definitions and models of research impact offer valuable perspectives for LGM research. There is a need to build more specific theories of research impact that align with the contexts, research issues, methods and outcomes associated with LGM research.
- Using Complex Adaptive Systems (CAS) thinking as an approach to explore LGM research impact challenges simple cause and effect assumptions about research impact. Research impact is instead seen as a system made up of dynamic process where the interactions and relationships of different components simultaneously affect and are shaped by the system. From this perspective, LGM researchers can shape both how research impact is defined and how research impact is achieved.
- A range of perspectives of research impact exist, including categories that define types of outcomes, scale of impact, spread of impact, and impact pathways/processes. Some concepts are more useful for judging impact outcomes, while others are more useful for understanding the processes of how impact was achieved. A range of perspectives was used in the present study to explore both the outcomes and processes of LGM research impact.
- To understand research impact, there is a need to unpack the complex processes of interaction between researchers and non-academic groups such as collaborators, stakeholders and research users. This includes exploring the different positions and roles of diverse groups of people and the different types of processes of interaction involved, such as collaboration, engagement and involvement in the research.
- Public and user involvement is increasingly becoming central to many areas of organisational decision-making and professional practice and it is likely to be a significant contributing factor to research impact. It would therefore be useful for subsequent iterations of REF to specifically ask about public/user involvement in relation to research impact.
- Mechanisms for exchange can be perceived as events or actions to support productive interactions between researchers and stakeholders in the research process. HEIs could use the concept to review their organisational infrastructure and support for research impact.

Chapter 3 presents the first set of findings on the nature and scope of LGM research impact.

Chapter 3. The nature and scope of LGM research impact

3.1 Contributing regions and HEIs

LGM case studies by UK region

All of the UK regions returned case studies that related to the LGM field (Table 3). A high proportion of the included case studies (16%, 203) came from the London region, followed by the South East (13%) and Scotland (12%).

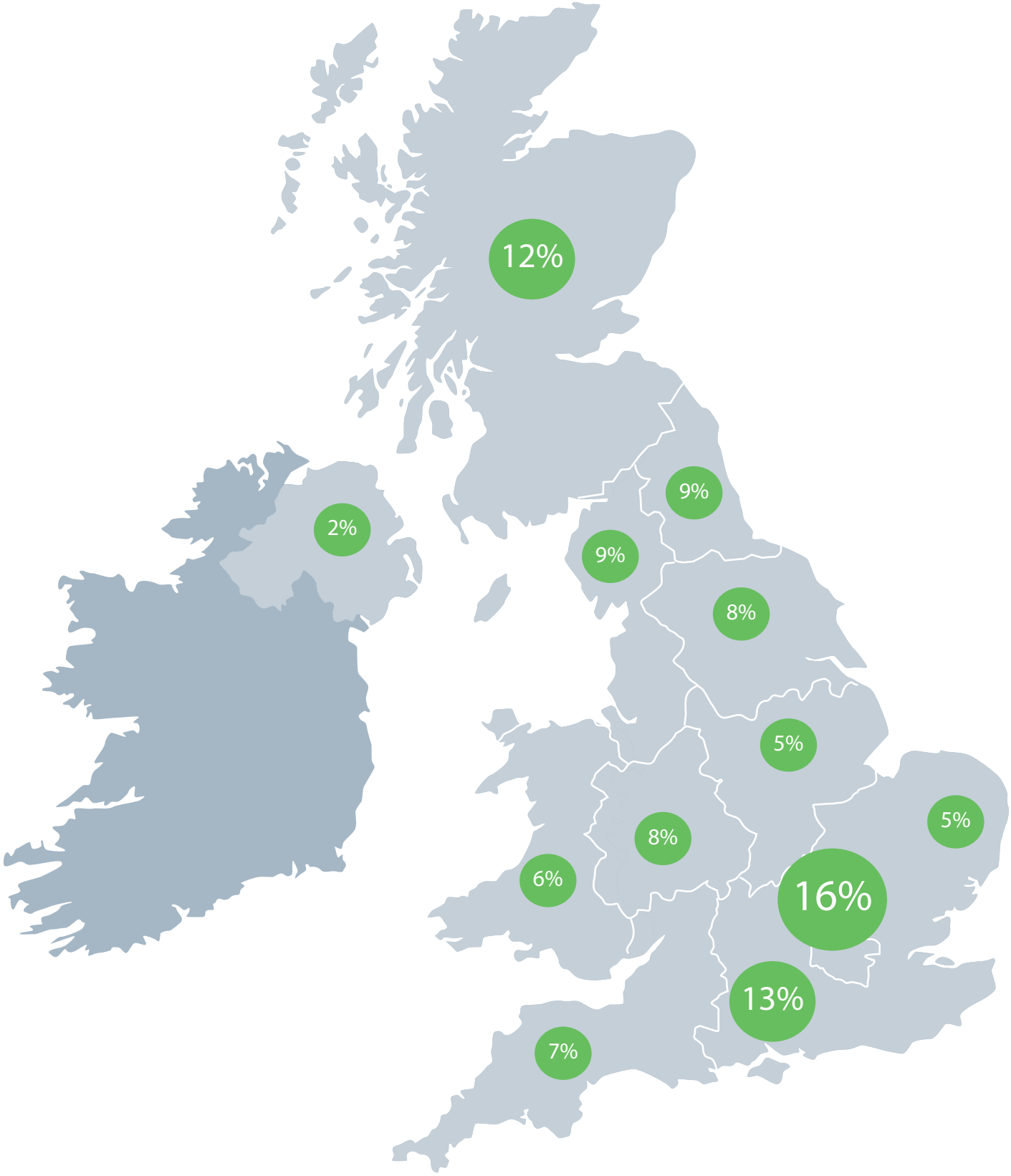
Table 3: LGM case studies by UK region

Region	Cases	%
London	203	16
South East	173	13
Scotland	153	12
North West	119	9
North East	114	9
Yorkshire and the Humber	111	8
West Midlands	109	8
South West	89	7
Wales	75	6
East	71	5
East Midlands	60	5
Northern Ireland	32	2
Total	1,309	100

Notes;
Cases = number of included case studies returned by region
% = percentage of total sample of case studies returned by region

Figure 5 shows the distribution of LGM case studies across the UK regions

Figure 5: Distribution of LGM case studies across UK regions



Note:
The total number of LGM case studies is 1,309, returned by 131 HEIs.

Regional averages

The distribution of LGM research across the UK is influenced by the considerable variation in the number of HEIs within different regions (from four HEIs in Northern Ireland to 39 HEIs in London). Looking at the numbers of HEIs within a region compared with the number of returning HEIs gives an indication of the interest in LGM research within a region (Table 4). In half of the UK regions, all HEIs submitted LGM case studies.

Table 4: HEIs by region contributing to LGM research

Region	HEIs within region	Returning HEIs	% of HEIs
Yorkshire and the Humber	10	10	100
West Midlands	11	11	100
East Midlands	9	9	100
Wales	9	9	100
Scotland	18	18	100
North East	5	5	100
South East	16	15	93
North West	14	11	78
East	9	7	77
London	39	27	69
South West	11	7	63
Northern Ireland	4	2	50
Total	154	131	86

Notes;
HEIs within region = total number of HEIs within each region
Returning HEIs = number of HEIs within a region that returned included case studies
% of HEIs = the percentage of returning HEIs of all HEIs within a region

For individual HEIs, a substantial proportion (86%, n=131 HEIs) of the 154 UK universities that submitted to the REF returned case studies considered to be within the field of LGM research. Annex 1 shows the individual breakdown for each HEI. The University of Oxford, Cardiff University, the University of Edinburgh and the University of Manchester had the highest numbers of included case studies (30+ case studies from each HEI).

3.2 Contributing disciplines

Institutions were invited to make REF submissions in 36 subject areas, called Units of Assessment (UOAs). The REF submissions were assessed by an expert sub-panel for each UOA. The included sample of LGM research case studies is spread across all 36 UOAs (Table 5). The greatest proportion of case studies is within business and management studies (19%), followed by education (8%).

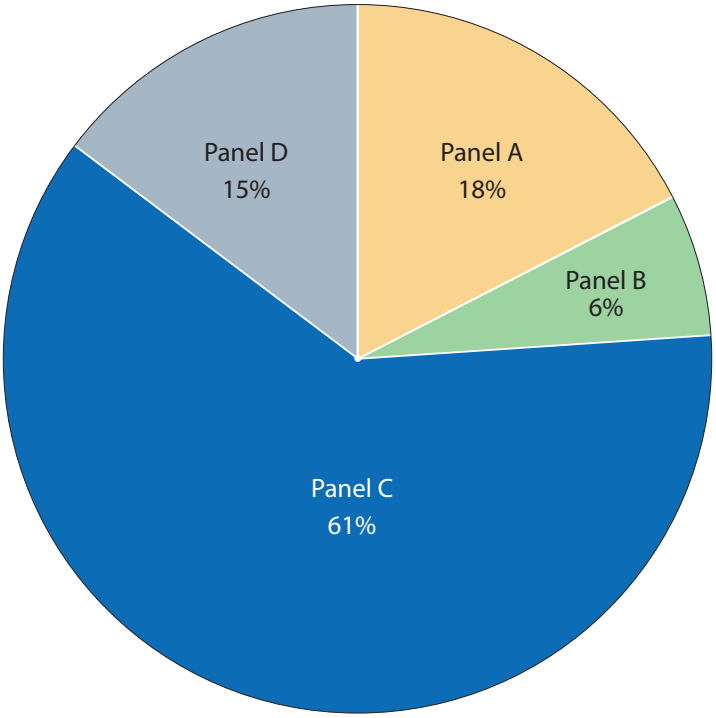
Table 5: LGM case studies by Unit of Assessment

Unit of Assessment	Count	%
Business and management studies	243	19
Education	108	8
Politics and international studies	94	7
Allied health professions, dentistry, nursing and pharmacy	85	6
Social work and social policy	80	6
Law	72	6
Psychology, psychiatry and neuroscience	64	5
Architecture, built environment and planning	42	3
Geography, environmental studies and archaeology	42	3
Sociology	41	3
Sport and exercise sciences, leisure and tourism	38	3
Communication, cultural, media, library & information	33	3
Clinical medicine	31	2
History	30	2
Computer science and informatics	28	2
Public health, health services and primary care	28	2
Economics and econometrics	27	2
Area studies	21	2
Modern languages and linguistics	21	2
Philosophy	21	2
Other English language and literature (n=19), art and design: history, practice and theory (n=17), mathematical sciences (n=17), anthropology and development studies (n=15), theology and religious studies (n=15), general engineering (n=14), music, drama, dance and performing arts (n=14), biological sciences (n=12), earth systems and environmental sciences (n=10), agriculture, veterinary and food science (n=9), electrical and electronic engineering, metallurgy and materials (n=4), aeronautical, mechanical, chemical and manufacturing engineering (n=3), classics (n=3), physics (n=3), chemistry (n=3), civil and construction engineering (n=2)	160	12
Total	**1,309**	**100**

LGM case studies by REF panel

Looking across the four REF panels, the greatest proportion of LGM research case studies are within Panel C (61%, n=802) (Figure 6). Panel subject areas are shown in Table 6. The prominence of LGM research in Panel C is attributable to high numbers of LGM case studies within UOAs for business and management studies, education, politics and international studies, social work and social policy. The main implication of this finding is that in the future, any targeting of findings or information about LGM research impact could be directed towards Panel C subject areas (Table 6).

Figure 6: Included case studies by REF panel



Notes;
Numbers of included case studies within each panel were: Panel C (n=802), Panel A (n=229), Panel D (n=194), Panel B (n=84).

Table 6: Included case studies by REF panel

REF Panel	Count	Total	%
Panel A			
Clinical medicine	31	229	18
Public health, health services and primary care	28		
Allied health professions, dentistry, nursing and pharmacy	85		
Psychology, psychiatry and neuroscience	64		
Biological sciences	12		
Agriculture, veterinary and food science	9		
Panel B			
Earth systems and environmental sciences	10	84	4
Chemistry	3		
Physics	3		
Mathematical sciences	17		
Computer science and informatics	28		
Aeronautical, mechanical, chemical and manufacturing engineering	3		
Electrical and electronic engineering, metallurgy and materials	4		
Civil and construction engineering	2		
General engineering	14		
Panel C			
Architecture, built environment and planning	42	802	61
Geography, environmental studies and archaeology	42		
Economics and econometrics	27		
Business and management studies	243		
Law	72		
Politics and international studies	94		
Social work and social policy	80		
Sociology	41		
Anthropology and development studies	15		
Education	108		
Sport and exercise sciences, leisure and tourism	38		
Panel D			
Area studies	21	194	15
Modern languages and linguistics	21		
English language and literature	19		
History	30		
Classics	3		
Philosophy	21		
Theology and religious studies	15		
Art and design: history, practice and theory	17		
Music, drama, dance and performing arts	14		
Communication, cultural, media, library & information	33		

3.3 Types of impact

Qualitative analysis of the case studies reveals the wide range of types of impact that are associated with LGM research. A detailed synthesis of the types of impact captured within these categories is provided in Annex 2, which was used to identify impact keywords. Table 7 presents summary findings from keyword searches of the case studies in the types of impact identified.

Table 7: Impact keywords within the LGM case studies (in Details of Impact)

Keyword	Count	No. cases	% cases
Government policy	676	676	51.6
Training	615	615	47.0
Understanding	506	506	38.7
Strategy	478	478	36.5
Model	732	366	28.0
Awareness	321	321	24.5
System	312	312	23.8
Regulation	346	307	23.5
Support network	235	235	18.0
Standards	230	230	17.6
Participation	223	223	17.0
Guidelines	212	212	16.2
Technology	203	203	15.5
Intervention	394	197	15.0
Course	190	190	14.5
Law	180	180	13.8
Behaviour	143	143	10.9
Knowledge-transfer	136	136	10.4
Measure	98	98	7.5
Organisational development	95	95	7.3
Priorities	95	95	7.3
Information resource	95	95	7.3
Toolkit	81	81	6.2
Research method	71	71	5.4
Art	66	66	5.0
Benchmark	44	44	3.4
Organisational performance	36	36	2.8
End-user	30	30	2.3
Decision aid	30	30	2.3
Music	25	25	1.9
Attitude	38	19	1.5
Teaching method	14	14	1.1
	6,950	6,329	483.80

Notes:
Count = total number of keywords within the case studies searching in Details of Impact
No. cases = the number of case studies that contained a keyword
Cases = the proportion of case studies containing a keyword shown as a percentage of the total sample of case studies (n=1309)

Categories of impact type

Further synthesis and categorisation of the case study data reported above reveal four main types of impact, as follows:

Type I: Use of evidence
Type II: Research products
Type III: Effect on individuals
Type IV: Effect on groups/organisations

Table 8 shows the types of impact within each category. Any one case study can contain multiple types of impact. For example, effects of research at the individual or group/organisational level may precede or accompany citation of evidence or development of research products.

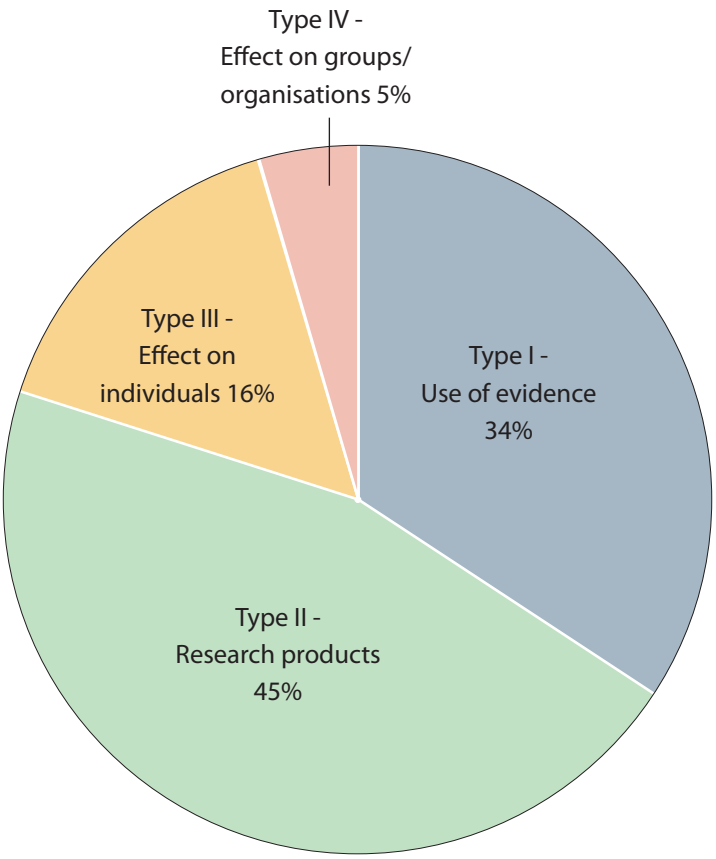
Table 8: Classification of types of LGM research impact

TYPE I **Use of evidence**	**TYPE II** **Research products**
• Law • Government policy • Strategy • Regulation • Standards • Guidelines (recommendations for practice) • Priorities (for research or practice)	• Training programme or course • Intervention (programme or initiative) • Toolkit • Model • Decision aid • System (operational) • Support network • Technology • Measure • Benchmark • Information resource • Research method • Participation method • Teaching method • Visual art, music or fiction
TYPE III **Effect on individuals**	**TYPE IV** **Effect on groups/organisations**
• Awareness • Attitude • Understanding (knowledge) • Behaviour	• Knowledge transfer (intra-organisation, inter-organisation or network) • Organisational development (innovation, new systems or structures) • Organisational performance (impact on end-users)

Categories of impact type reported in the case study data

A keyword analysis of the included case studies indicates that a high proportion of the impacts reported (nearly 80%) are type 1 or type II impacts (Figure 7). Far fewer (just over 20%) of the impacts are the effect of the research on individuals or groups/organisations. Caution needs to be taken in interpreting these results as the analysis is based on text mining rather than content analysis. However, the results show that authors were far more likely to report on use of evidence or research products than they were to make claims about the effects of research on beneficiaries.

Figure 7: Categories of impact type within the included LGM case studies



Type of impact	No. cases	%
Type I: Use of evidence	2,178	34
Type II: Research products	2,865	45
Type III: Effect on individuals	989	16
Type IV: Effect on groups/organisations	297	5
Total	6,329	100

Notes;
No. cases = Number of case studies containing one or more impact keyword (6,329 cases in total for 1,309 case studies)
% = Proportion of case studies by impact type category

3.4 Beneficiaries of LGM research

The 2014 REF guidelines encouraged researchers to describe who the beneficiaries of research were. Although the term was used to mean 'those who have benefited from the research', it takes on different meanings in each case study. Reading through the case study data helped to distinguish between beneficiaries and other groups of participants or groups involved in the research.

Keywords based around people and groups were identified by generating a list of types of beneficiaries directly from the case study data (reading Summary of Impact). The list of types of beneficiaries was checked for internal consistency (whether the categories were distinct and coherent). Keywords were then selected to enable systematic searching for each term across the LGM sample of case studies.

Text mining the sample for keywords (in Details of Impact) showed who the different beneficiaries of LGM research are (Table 9). Over two-thirds of the case studies (61.4%) claim that the public has benefited from the research.

Table 9: Keywords for people and groups (in Details of Impact)

Keyword	Count	Cases	% Cases
Public	804	804	61.4
Community	518	518	39.6
Researchers	340	340	26.0
Professionals	301	301	23.0
Academics	243	243	18.6
Managers	197	197	15.0
Beneficiaries	169	169	12.9
Teachers	162	162	12.4
Young people	161	161	12.3
Patient	155	155	11.8
Population	153	153	11.7
Leaders	151	151	11.5
Audiences	140	140	10.7
Student	126	126	9.6
Stakeholder	105	105	8.0
Service users	102	102	7.8
Older people	54	54	4.1
End-user	30	30	2.3
Governors	14	14	1.1
Policymaker	10	10	0.8

Identifying types of beneficiaries across the case studies is not without its problems and differences in terms used by case study authors could hinder meaningful comparisons of research impact. A broader classification is to group beneficiaries according to their relationship to the research using the categories – stakeholders, research users, researchers, and end-users (Table 10). These categories help to explain the types of beneficiaries relative to the research. It could be used to describe potential beneficiaries identified *a priori* by research teams or funders, as well as actual beneficiaries identified once the research is under way.

Table 10: Classification of beneficiaries

Beneficiaries	Description	Examples of possible benefit
Stakeholders	*People directly influencing or involved in the research, for example policymakers, commissioners, regulators or collaborators in the research*	Intra-organisational knowledge mobilisation and inter-organisation knowledge transfer
Researchers	*People who are responsible for the governance and undertaking of research, which may or may not include collaborators in the research*	Improvements in research infrastructure, research capacity, researcher skills or organisational performance in research assessment
Research users	*People who use, or may use in the future, research outputs, for example policymakers, service providers, leaders, managers, educators or practitioners*	Individual or group/organisational development or innovation, or improved performance
End-users	*People benefiting from the outcomes of the research who may or may not be directly involved in the research, for example staff, students, patients, customers, business service users or groups of the public*	Improvements in end-user experiences such as student experiences of HE, or improved end-user outcomes such as knowledge, skills or behaviour, or improved potential to access services, knowledge or resources

Looking at the frequency of keywords according to these categories of beneficiaries (Table 11) reveals that over half relate to end-users (53%) (public, community, young people, patient, student, service users, older people, end-user) and nearly a third relate to research users (27 %) (professionals, academics, managers, teachers, leaders, governors, policymaker). Key terms relating to researchers or stakeholders appear far less often. The categorisation of the data based on keywords provides a basic indication of the relative focus on different groups of beneficiaries in the case studies, with end-users emerging as the most prominent focus (although only 30 case studies actually used the term end-user).

Table 11: Frequency of reporting of type of beneficiary

Beneficiaries	Count	% count
End-user	2073	53
Research user	1068	27
Researcher	340	9
Non-specific (audiences/beneficiaries)	309	8
Stakeholder	115	3
Total	3,905	

3.5 Impact on higher education

This section focuses on 20 selected case study examples identified as highly relevant to leadership, governance or management in higher education during the screening process. Case studies in this subsample mostly relate to impact of LGM in educational or commercial organisations. They have been selected as examples because they illustrate different ways that LGM research might impact on higher education. There is no way of knowing how the REF panels rated these case studies.

The following research themes emerging from the sample of case studies are examined:

- leadership skills and behaviours
- equality and diversity in leadership roles
- coordination and leadership capacity development
- management development
- change management
- organisational improvement
- LGM research methods.

Leadership skills and behaviours

Researchers at Lancaster University have undertaken research on leadership in the UK further education sector (further education colleges, sixth-form colleges, training organisations, work-based learning and adult and community learning) to improve leadership succession in further education. The Practitioner Research programme was developed in response to the declining number of applicants for leadership posts in further education. Funded by the UK government's Learning and Skills Improvement Service, the programme offered further education leaders and managers the opportunity to produce research-informed answers to challenges they were facing in their own practice. Findings were developed into 88 practitioner research reports that were disseminated to every further education college in England and Wales and made available online. This case study illustrates how engagement with research users' enhanced knowledge and understanding of leadership issues stimulated organisational change and improved the performance of individuals, teams and organisations. The initial impact of the research was the effect on individual participants' knowledge (type III impact) of contemporary leadership theory and practice, stimulated by participant engagement in projects focused around the use of evidence in research-based solutions to identified leadership challenges (type I impact). Part of the approach was to emphasise the value of addressing the dialectical interplay between leaders, managers, followers and contexts and the value of 'blended leadership' practices that combine elements of both heroic and post-heroic approaches. The resultant hybrid model is a research product (type II impact) that is informing leadership practice in educational contexts. Impact has also included effects on groups of further education staff in participants' HEIs (type IV impact).

Use of research products is the main type of impact (type II impact) attributable to extensive research at the London Business School with leaders in public and private sectors including higher education. The research examined the foundations of great leadership and shows that the key characteristic that distinguishes great leaders is that they are authentic. The work has influenced key leadership competencies and training in leading organisations across the world. The case study describes four behaviours that differentiate great leaders from mediocre ones: (i) they selectively show their weaknesses; (ii) they rely on intuition; (iii) they manage with tough empathy; and (iv) they reveal their differences. The authors argue that to be an authentic leader, one needs to know oneself and others very well, and to connect to the context in which they are leaders. The researchers presented a list of specific actions that one could take to become better at all four behaviours (type II impact).

In another case study from St Mary's University Twickenham, research investigated the personal qualities and experiences that seemed to inform the success of outstanding headteachers. The approach was to investigate the personal journeys of outstanding heads and how these shaped them as leaders. It also considered the extent to which personal experiences, in addition to qualifications, experience and development strategies, explain leadership effectiveness. The main type of impact described is the use of research evidence (type I impact) to inform leadership development programmes. Specifically, the evidence includes findings on moral confidence and personal beliefs, networking with fellow professionals, display of openness to learning from the example of other school leaders and pupils, robust and realistic sense of self, and investment in personal growth and development.

Equality and diversity in leadership roles

The research underpinning the next case study example from the University of East London seeks to promote gender equality in public sector governance. The research provides evidence on the relatively low numbers of women in middle and senior positions of responsibility and decision-making in the public and third sectors to inform ways in which this situation might be rectified internationally (type I impact). The research has been used to identify and promote methods of capacity building (type II impact) among women from developing countries around the world and from many walks of life, from lawyers to illiterate community activists. Further impact from this research relates to effect on the individual capacity of these women (type III impact) to be able practitioners once given the opportunity to do so.

The following case study from the University of Exeter reports on 'the glass cliff', a concept emerging from a programme of research investigating the contexts in which women (and other minorities) are appointed to leadership positions. The research has demonstrated that women are more likely to be appointed to leadership positions that are associated with an increased risk of criticism and failure. Extending the metaphor of the 'glass ceiling' and the 'glass elevator', the researchers dubbed this phenomenon 'the glass cliff'. The research used analysis of the 2003 performance of FTSE 100 companies to reveal that while there was a relationship between female board members and share price performance, this wasn't because women in top jobs were causing poor company performance, it was because they were more likely to be appointed to such jobs after a consistent pattern of poor company performance. Thus, women tended to occupy leadership roles that were more risky and more precarious than their male counterparts. Subsequent experimental studies revealed that the traits required from a leader in times of crisis are more likely to be stereotypical of women than they are of men; and that female traits are seen as especially useful when a leader is required to manage people in times of crisis, or more worryingly, when they are needed to serve as scapegoats. Evidence has been used to inform HR policy and practice (type I impact). The effects on individual participants (type III impact) and effects on organisations (type IV impact) include changed HR procedures, flexible working options, bonus schemes, and the creation of internal support networks.

Coordination and leadership capacity development

The University of Wolverhampton reports on research into the leadership of collaboration in, between and among educational organisations. The research has resulted in a range of outputs and processes that have had an impact on how leaders and practitioners work in partnership, design joint professional development programmes, and evaluate and sustain collaborative working. Ability to develop collaborative initiatives has been improved by identifying the influence of the multiple personal, professional and organisational networks that leaders occupy, and how their interaction affects the leadership of collaborative reforms and inter-organisational partnerships (type I impact). The research has also expanded the nature of the structural analysis used to study leadership activity (type II impact) by recognising the impact on collaboration of a range of 'deep' social structures, based on cultural norms, shared educational values and social affiliations, all of which affect leaders' professional identities. These theoretical advancements also led to methodological innovations (type II impact), including the increasing use of social network analysis to map the flow of interactions and relationships among leaders, organisations and practitioners.

Management development

The programme of work that underpins the case study by the University of Sunderland was initiated to explore alternative pedagogies for management development. Decline in heavy industry had led to high levels of unemployment and a need within the study region to engage, develop and retrain managers to enable them to react to changing employment dynamics. Traditional pedagogies were less than effective at engaging managers within the region, and a programme of ongoing research was developed to inform management curriculum development. The research developed an innovative model of work-based learning, and has subsequently developed into four core themes of professional identity, inter-professional working, creativity and coaching. Impact has included knowledge-transfer and inter-professional learning (type IV impact). A series of qualitative studies have evaluated the impact of the model on learners and their practice (type III impact).

The University of Brighton reports on impact from a series of research projects in the area of learning networks. The resultant Profitnet programme is being used as an 'advanced laboratory' to investigate various aspects of peer-to-peer learning and to experiment with new forms of peer-to-peer interaction. The research has shown that effective setting-up of peer-to-peer activities focuses on 'translating' experience acquired through running a business into reflection and then into new kinds of action. The main type of impact has been the development of learning networks (type II impact), including developing operating

processes and routines for learning networks, regulation of the knowledge-sharing process, the development of a constructive interaction between knowledge holders and knowledge 'recipients', the reification of knowledge from experts outside the peer group, and the protection of the peers from commercial interests. The research has shown how peer-to-peer interactions can enable the connection of SMEs with the research base (ie, universities, research institutes, etc) and translation of knowledge from the research provider to the research user (type IV impact).

The University of the West of England has undertaken a series of studies on the role of front-line managers (FLMs) in people management. The research has generated empirical evidence that, as 'HR agents', FLMs can influence employee attitudes and behaviours by the way in which they interpret and apply people management practices and show leadership (type I impact). Specific evidence from the research includes FLM impact on employees and organisational success, evidence on the role of these managers, the factors that enable and inhibit FLMs in delivering effective performance and the skills, behaviours and environments that make FLMs effective. Common constraints include issues of role conflict, work overload, lack of appropriate skills and knowledge, inadequate training, pressure to focus on short-term priorities and poor motivation and commitment to embrace people management, and lack of support from the HR function and senior managers. Evidence and research outputs from this research (type II impact) could be used in higher education settings to inform skills, behaviours and supportive conditions for FLMs.

Aston University have developed a new change management approach. The approach, known as the Process Orientated Holonic (PrOH) Modelling Methodology, has been used to model, debate and implement changes to strategy and operational processes in service and manufacturing organisations (type I and type IV impact). The PrOH Modelling Methodology is an extension of Soft Systems Methodology (SSM), which can be used to represent the complex processes involved in a human activity such as a business process. In addition, systems thinking presentational techniques (eg, story boarding; combining words and pictures effectively; and the use of scene-setting) have been perfected in PrOH Modelling to make it appealing and accessible to non-expert practising managers. The impact of this research could be spread by adapting and developing research outputs (type II impact) for use in the context of higher education to better understand organisational processes and to inform change management initiatives.

Kingston University's Centre for Research in Employment Skills and Society (CRESS) reported on its programme of research on 2,000 working adults from across the UK. This looked at factors affecting work motivation and performance, including the emotional, cognitive and physical dimensions of engagement. This initial work found that the drivers of engagement included the ability of employees to feed their views upwards, feeling well informed about the organisation, and thinking that one's manager was committed to the organisation. The subsequent Employee Engagement Consortium (EEC) project involves collaboration with 10 public and private sector companies. In-depth case studies were developed for each member organisation, involving a questionnaire survey and number of face-to-face interviews. The main types of impact from this research are use of evidence (type I impact), including evidence on the mediating role of engagement on performance, how line manager behaviour and HRM practices influenced engagement, and the benefits of employees feeling involved and socially connected with their work to effect change in employee outcomes in organisations (type IV impact). More recent research has focused on generating definitions and measurements of engagement (type II impact).

In a case study of change management, researchers at the University of Bath have undertaken longitudinal research to develop an approach to the strategic implementation of change. The Change Management Consortium (CMC) is a collaborative network of academics and organisations seeking to improve knowledge and practice on staff engagement in the strategic implementation of change. The network has helped organisational members of the CMC internally to improve employee trust and to build commitment to change (type II impact). The CMC provides member organisations (including Aviva, Ernst & Young, GKN, GlaxoSmithKline, Kraft Foods, the Ministry of Defence and T-Mobile) with opportunities to utilise highly relevant research findings in order to create cross-organisational dialogues on improving practice. The research offers higher education insights into the way in which large organisations can address employee engagement in strategic change and bring about improvements in workplace practices (type IV impact).

Also undertaken in the context of modern workplace changes, organisational cultures and worker mobility in the public sector, a case study from the University of Southampton examines changing forms of work and organisation. The Work Futures Research Centre has informed a new training and qualifications framework and improved programme performance for healthcare workforces involved in digital innovation, leading to new recommendations for sustainable workplace design to enhance employee well-being and productivity. The impact of the research includes use of evidence on sustained workforce inequalities in public service organisations to inform change processes (type I impact). The research has also explored how the physical design of workplaces affects employee well-being and productivity to show that workplace design has a significant bearing on individuals' motivation, working relationships and well-being. These insights could be developed and tested in higher education contexts to improve staff outcomes.

Organisational improvement

Researchers at the University of Bedfordshire have examined work-related stress and well-being including research in the higher education sector. The research builds on six national surveys on work-related well-being in higher education and post-compulsory education more generally. This body of research has facilitated a longitudinal analysis of the working conditions underpinning the well-being of academic staff at a national level, their responses to ongoing change in the sector, and the implications for employees and HEIs. The significance and reach of this work have been demonstrated, most notably with academic employees and social workers. It has been used to develop interventions and has informed changes to policy and practice at a national level in these sectors. Specific areas of evidence include academics' experiences of the work–home interface and work–life conflict. Published work that has tested models of stress in the sector has also provided evidence (type I impact) on the role played by working conditions in underpinning well-being, particularly the need for professional esteem and respect and the role played by individual differences. Research with people in the helping and service professions has focused on enhancing resilience and well-being in social workers. The research has outlined the factors that underpin resilience and led to interventions for staff (type II impact).

Interdisciplinary research at the University of West London has used theoretical perspectives of social identity frameworks and cultural capital to examine widening participation policy and practice within the higher education sector in England. The research has led to the use of evidence in higher education practice (type I impact) and development of interventions (type II impact) to support widening participation (WP) students within undergraduate and postgraduate study, and beyond into successful career pathways. The research programme explores the moderating and mediating factors in WP students' achievement and experience within and beyond university.

Research into the organisational dimensions of institutional racism and race equality in the higher education sector used the University of Leeds as its case study. Surveys and interviews with staff and students indicated the prevalence of racist discourses and incidents in HEI settings, with approximately 25% of staff and students identifying these practices. The evidence has been used to inform practice in major spheres where no attention had been given to these issues, for example in teaching, learning and purchasing (type I impact). The research informed the development of a 'toolkit' (type II impact) to assess racism across most aspects of an HEI's operations including leadership and management, teaching and learning, employment, research, purchasing and contracting and external relations. The effects of the research have changed how individuals view racism (type III impact) and have spread through knowledge-transfer to effect organisational development in other sectors (type IV impact).

LGM research methods

Researchers at the University of Hull undertook investigations (in the UK and Hong Kong) of school leaders' perceptions of perceived challenges and how headteachers implement sustainable development approaches. The methodology they have developed (type II impact) consists of taped and transcribed semi-structured interviews, followed by written 'portraits' of individuals derived from the transcript. Each portrait consists of the interviewer's impression of how a particular leader engages with their work, and the challenge they face. The impact of the research includes effects on individual leaders' awareness and understanding of their leadership practices (type III impact). Portrait methodology might be a useful and acceptable approach to enable higher education leaders to reflect and make decisions on the challenges they face.

Researchers at Loughborough University have conducted a series of projects applying and developing cross-national research methods to issues of European social policy and citizenship. This has included producing cross-national research seminars, international social research methods training workshops, and network building (type II impact). Effects on participating groups include addressing theoretical, methodological, managerial and practical issues involved in research that crosses national boundaries and on the application of such research in policy analysis (type III impact). Another research output is a sustainable databank of international social research methods case studies[247]. This body of research provides research institutions, including HEIs, with evidence to inform new international collaborations and initiatives (type I impact).

Another case study from Loughborough University building on research carried out at the Centre for the Study of International Governance explains the impact of research on diplomacy and international governance. The research has involved close contact with diplomats and other government/EU officials, as well as dissemination to civil society organisations and students in a variety of contexts. Types of impact from this research include the use of evidence and research products to inform strategy development (type I and II impact). Specific findings of this research are in understanding national diplomatic structures in the EU, the interface between governance and diplomacy, and creating change and innovation in diplomatic practice (type III impact). Findings related to the changing character of diplomacy, especially the rise of 'network diplomacy' and 'multi-stakeholder' diplomacy could inform LGM research in the higher education sector.

Researchers at Southampton University have undertaken an extensive programme of experimental research entitled Rediscovering the Civic and Achieving Better Outcomes in Public Policy. The research considered different ideas to promote civic behaviour, including 'nudge' concepts (focusing on social cues and signals, introducing small incentives and harnessing peer pressure) and 'think' strategies (asking people to reflect on, discuss and deliberate over information provided). The main impact of the research has been the use of evidence to inform policy and strategy (type I impact). The research demonstrates the importance of both the type of message the citizen receives and the particular design of the institutional arrangements. Effects on individuals engaged in this research (type III impact) could be spread to staff in higher education contexts to encourage employee, student or public/user involvement in higher education research.

The 20 case studies synthesised above provide a snapshot of the types of research and impact that LGM research encompasses. Although this section reports on a relatively small sample of case studies, it clearly shows that there is great potential to extend and spread impact of this research within higher education contexts. LGM research can inform leadership, governance and management practices. It can also support higher education leaders and managers to negotiate issues of quality, efficiency and equality in higher education. The next sections of the report use the same sample of case studies to examine the types of timescales involved and spread of impact.

3.6 Timescales to impact

Table 12 uses information from the 20 selected LGM studies described in the previous section to gain an indication of timescale to LGM impact. Timescales for reported outcomes varied from 0–19 years. This was based on the stated start dates reported by authors for the underpinning research. Reported timescales reflect the 20-year research to impact timeframe stipulated by REF guidelines. Some case studies reported impact within the first year, while others reported impact as occurring after 10 years or more.

247 http://www.restore.ac.uk/ISResMeth/

Table 12: Case study types of impact and years to impact

Case study	Start of research	Type of impact	Years to impact
Developing leadership in FE: the Practitioner Research Programme	2006	Type I Type II Type III Type IV	0, 3, 5 4 4 3
Why should anyone be led by you?	2000	Type II	0, 5, 6
Rethinking educational leadership through empirical and conceptual inquiry	2009	Type I	0, 1, 2
Promoting gender equity in public sector governance	1990	Type I Type II Type III	15 12, 18 18, 19
Discovering the glass cliff: Insights into subtle gender discrimination in the workplace	2003	Type I Type III Type IV	1, 2, 5 5, 8 7
Improving leaders' and practitioners' ability to develop collaborative initiatives and learn from each other	2004	Type I Type II	2 6, 9
Transforming management thinking through alternative pedagogies	2001	Type III Type IV	5 8
Profitnet Programme ICS	1996	Type II Type IV	8 12
Recognising and supporting front-line managers in delivering effective people management	2005	Type I Type II	5 4
Using systems thinking to improve operations management practice in organisations	2003	Type I Type II Type IV	3 5 8, 10
Impact on policy and practice in human resources to improve employee engagement	2006	Type I Type II Type IV	2, 3, 4 2, 6 2
Redesigning strategic change to enhance employee engagement during intense organisational transformation	2004	Type II Type IV	4 6
Managing and adapting to organisational change	1997	Type I	4, 6, 15
Improving employee well-being through diagnosis, intervention and evaluation of policy and practice	1996	Type I Type II	12 14, 18, 19
Widening participation policy and practice within the higher education sector in England	2006	Type I Type II	2 6
Building the antiracist university	2000	Type I Type II Type III Type IV	11 8, 12 10 10
The international reach and significance of portrait methodology upon individuals and organisations	2004	Type II Type III	5, 6, 8 5, 6, 8

Table 12: Case study types of impact and years to impact (continued)

Case study	Start of research	Type of impact	Years to impact
International social research methods: enhancement of analysis, resources and training	1993	Type I Type II Type III	7 11, 16 11
Diplomacy and international governance: enhancing practice through innovation in theory and analysis	2000	Type I Type II Type III	7, 13 5, 8 5, 8
Developing policy and practice capacity for nudging behaviour change in citizens	2007	Type I Type III	2, 3 3, 5

The combined results from the subsample of 20 selected case studies show a mean average of seven years for reported impacts to occur (Table 13). This timescale fits within the three- to nine-year timescale identified by the high-level analysis of the whole database (based on analysis of references to the research[248]).

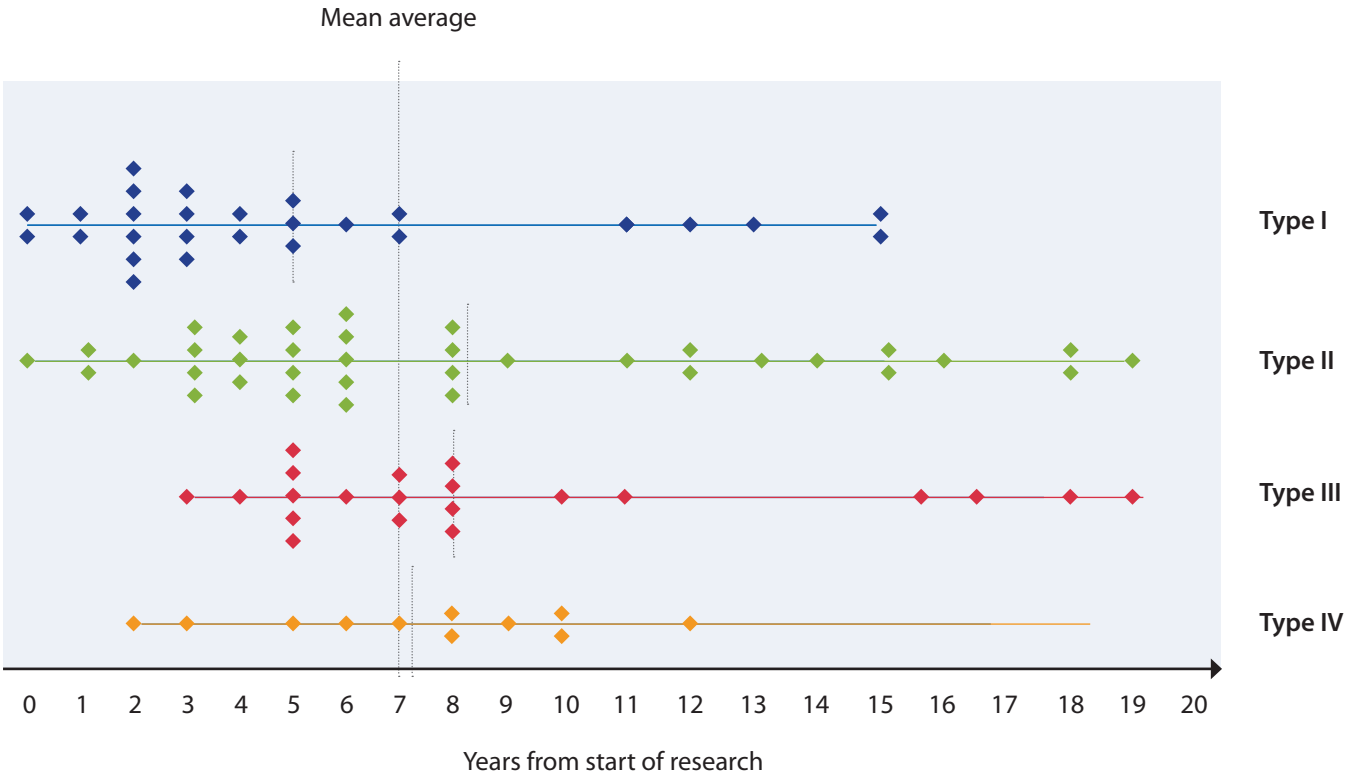
Table 13: Average years to impact (higher education subsample)

Impact	Count	Total years	Mean Average
Type I	135	27	5
Type II	225	27	8.3
Type III	120	15	8
Type IV	66	9	7.3
Total	546	78	7

Figure 8 illustrates all of the reported timescales to impact for each of the 20 case studies. Figure 8 shows that type I impacts (use of evidence in policy or practice, for example) tended to emerge before other impact types. Type II impacts (training courses, interventions and models, for example) were on average slower to emerge as the majority of research products were developed three to eight years after the research began. The fact that the effect on individuals and groups/organisations (type III and type IV) tends to emerge on average between seven and eight years after the reported start of the underpinning research could correspond with peaks in research products (at six years).

248 King's College London and Digital Science (2015). The nature, scale and beneficiaries of research impact: An initial analysis of Research Excellence Framework (REF) 2014 impact case studies, p45. Bristol, United Kingdom: HEFCE.

Figure 8: Timescales to impact



These results are indicative of timescales to impact but the findings should be interpreted with caution. The results are derived from selected case studies and examples of impact and are limited by case study authors' choices about which examples of impact to report on. However, these timescales are likely to reflect researchers' views about the times of emergence of the most significant types of impact from the research.

3.7 Spread of impact

Table 14 uses information from the subsample of 20 selected case studies described previously. The focus of the analysis here is to gain an indication of spread of LGM impact. Case studies in this subsample mostly relate impact of LGM in educational or organisational (commercial) contexts. Spread was examined within each case study by reading through multiple sections of the case study (beginning with Summary of Impact, Details of Impact, and then Underpinning Research).

The analysis focused on identifying the initial reported locus of impact, ranging from single site/organisation to multinational, and the direction of spread of impact over the reporting period (shown on Table 14 using arrows). The analysis tracks the impact of the overall body of underpinning research for each case study. In this analysis, 'national' refers to the country in which the research was undertaken.

Table 14: Spread of impact

Case study	Single site/ organisation	Multi-site/ organisation	Regional	National	Multinational
Developing leadership in FE: the Practitioner Research Programme	← Local impact on FE colleges and teams			← National FE leadership programme	
Why should anyone be led by you?	← Impact on practice and education	← Impact on leadership selection		← Impact on national strategies	← Impact on business managers worldwide
Rethinking educational leadership through empirical and conceptual inquiry	← Impact on school leaders' practice			←→ Impact on leadership programme design	→ International values for school leadership
Promoting gender equity in public sector governance	← Impact on knowledge of gender equality			← Training and networking	← Nations' policies and capacity building
Discovering the glass cliff: Insights into subtle gender discrimination in the workplace	← Impact on HR strategies and peer support			← Public discourse and professional guidance	
Improving leaders' and practitioners' ability to develop collaborative initiatives and learn from each other	← Organisation learning and student outcomes	← School-to-school networks and evaluation	←→ Professional development for schools/ authorities	→ Educational policy and national roll-out	
Transforming management thinking through alternative pedagogies	← Individual manager and organisation performance	← Corporate and public services, NHS trusts	← Regional planning and work-based programmes		
Profitnet Programme ICS	← Skills in strategy and planning, expansion	← Inter-organisation peer-learning	← Impact on profits at regional level	← Peer-to-peer learning networks	← Small businesses in UK and overseas
Recognising and supporting front-line managers in delivering effective people management	← Support and performance of front-line managers			← Policies of public/ professional bodies	
Using systems thinking to improve operations management practice in organisations	← Company/ service strategy and operational processes	← Model and strategic operations processes			

Case study	Single site/ organisation	Multi-site/ organisation	Regional	National	Multinational
Impact on policy and practice in human resources to improve employee engagement	← HR practices and employee engagement/ outcomes			← Policies of a professional body	
Redesigning strategic change to enhance employee engagement during intense organisational transformation	← Strategies of change informed by employee engagement	← Cross-organisation dialogue		← Collaborative network of organisations and academics	
Managing and adapting to organisational change	← Workplace redesign and interventions for staff			← Strategies for innovation, design and inclusion	← Policy and debate on change management
Improving employee well-being through diagnosis, intervention and evaluation of policy and practice	← Training and support for employees	← Interventions for work–life balance		←→ Public sector policy, practice and monitoring	→ International discussion and debate
Widening participation (WP) policy and practice within the higher education sector in England	← WP student skills workshops	← Best practice in WP student interventions		← Factors affecting WP student outcomes	
Building the antiracist university	← Strategy and performance/ student outcomes			←→ Strategy and tools for HE/ voluntary sectors	→ International knowledge of intercultural conflict
The international reach and significance of portrait methodology upon individuals and organisations	← Educational leaders' career decisions	←→ Use of portrait methodology			→ Take-up of portrait methodology
International social research methods: enhancement of analysis, resources and training				→ Social/ citizen/ family policy formation and delivery	→ International research methods and training
Diplomacy and international governance: enhancing practice through innovation in theory and analysis				← Change in diplomatic structures and training	← Multination debate and knowledge exchange
Developing policy and practice capacity for nudging behaviour change in citizens	← Take-up by public and commercial organisations			←→ Use of civic behaviour change strategies	→ Take-up by international governments

Notes;

← Indicates spread towards local level

→ Indicates spread towards national or multinational level

Table 15 amalgamates the data on locus and direction of spread to show overall trends in spread for this subsample of 20 case studies. The case studies indicate that the locus of initial reported impact is most likely to be national (eg, impact on national policy or programmes) with spread of impact towards the local level (eg, organisational development or performance outcomes). Although the locus of initial reported impact could be multinational (as it was in one quarter of the case studies), spread of impact towards the international level was less common and generally followed impact at the national level. There was only one report of impact spreading directly from a single organisation to multiple organisations.

Table 15: Trends in spread

Case study	Single site/ organisation	Multi-site/ organisation	Regional	National	Multinational
Locus of initial reported impact	0	2	2	11	5
Spread towards local level (total count=52)	← 20	← 9	← 3	← 15	← 5
Spread towards local level (total count=14)	→ 0	→ 1	→ 1	→ 6	→ 6

Overall, this analysis could mean that most often the impact of LGM research spreads to individual HEIs after research has had a national impact or multi-site/organisational impact has occurred. In future research, it would be interesting to verify and explore these trends with case study authors to gain a more accurate picture of the patterns of uptake and diffusion of research.

Key learning points

- LGM research is being undertaken across all regions of the UK and it is possible to identify HEIs that are currently engaged in LGM research. These HEIs may wish to develop as centres of excellence and share learning or knowledge across the higher education sector.
- As LGM case studies were predominantly returned within REF Panel C, it would be useful for LGM researchers to work with research assessors for UOAs for business and management studies, education, politics and international studies, social work and social policy to develop future assessment practices for LGM research.
- Categorising LGM research impact (type I: Use of evidence, type II: Research products, type III: Effect on individuals, type IV: Effect on groups/organisations) is a useful way to think about the outcomes of research impact. However, the data tells us little about the interrelationships between these types of impact, or how REF panels rated different types of impact within case studies.
- The benefits of LGM research to researchers and research organisations can be overlooked. The impact of LGM research on research practice and research organisations including higher education is substantial. The impact of LGM research on higher education can include improved leadership skills and behaviours, equality and diversity in leadership roles, coordination and leadership capacity development, management development, change management, organisational improvement, and LGM research methods.
- The mean reported time to impact of LGM research in higher education contexts is seven years. LGM researchers may find it useful to take this timescale as a benchmark for predicting time to impact of their own research, remembering that it can take longer to develop research outputs or to see the effects of research on individuals, groups or organisations.
- Most often, the first reported place of LGM research impact is at a national level with subsequent spread of impact towards the local level. This could mean that it is advantageous for researchers to first target research outputs at a national level to facilitate widespread change at a local level.

The second part of the findings explores routes to research impact.

Chapter 4. Routes to research impact

This chapter reports on thematic analysis of routes to research impact, which draws on process perspectives of research impact (described in Chapter 2). The thematic analysis aimed to identify the range of ways that impact was promulgated in the included LGM case studies (objective 5 of the study). Eight impact processes were identified and are described in turn below.

4.1 Researcher impact skills

The included case studies emphasised the importance of researcher expertise, skills and knowledge in achieving research impact, as follows.

Researcher subject expertise and roles were described as contributing to impact in the majority of case studies (n=955). For example, researchers were recognised or regarded as authoritative and trustworthy, as having strong academic or technical credentials, a strong academic record of publications or a well-regarded position within a research university. In some cases, being known for previously carrying out a similar role or research well (track record), or having a high-profile public media reputation were cited as reasons for research impact.

Ability to collaborate was clearly an important advantage for case study authors and most researchers (n=820 case studies) were able to attract and work with other researchers within the limitations of research funding or research design. The included case studies report various forms of collaboration, from intra-organisational teamwork, to interdisciplinary and international collaborations. Research collaborations included formal financial and/or in-kind collaborations to enhance the application, and co-production of knowledge. Other types of collaboration or partnerships were used to support access to information, facilities or resources to support the research and its impact.

Interaction expertise included teamwork and empathetic competence to understand how research might need to be adapted or translated into other contexts, across disciplinary boundaries for example. Researchers' understanding and influence over stakeholders were also seen as advantageous for achieving research impact, for example, if researchers were recognised as having an influencing role on the decision-making of stakeholders through appointment to an advisory or special interest group (n=54).

Researcher skills to work with public/users was described in fewer case studies (n=25 of 293 case studies that used some form of public/user involvement) but those that did emphasised researchers' skills in the selection or recruitment of public/user representatives to be involved in the research.

Research design skills were a more implicit theme of the case studies and achievement of research impact. For example, researchers were able to generate impact through their knowledge of participative or collaborative research approaches. There was little indication that researchers working in the LGM field were limited by dispositional or subfield constraints (use of basic research or lab-based methods, for example) as the case studies expressed only positive views towards research impact and applied research.

Skills in impact planning was expressed in terms of researchers predicting the types of benefit and beneficiaries of the research, identifying target audiences and research users, setting objectives for impact, planning opportunities to maximise impact or attracting or allocating resources for impact activities.

Skills in participatory working tended to be described as researchers being skilled in shared decision-making, co-design or co-production, or having the know-how to work with particular client groups, such as young people or refugee communities.

Researcher communication skills were consistently described as contributing to research impact (n=249), particularly at dissemination stage. In most case studies, researchers had used their 'voice of authority' or 'recognised expertise' to influence wider policy, practice or research. Skills in public speaking, confidence in the research and the ability to explain technical or complex information were all mentioned as important skills.

Researcher skills and knowledge of research users through researcher engagement or collaboration (n=87) helped to understand user needs, generate useful research outputs or led to more active involvement in the implementation of outputs with research users.

Skills and knowledge in implementation were described in relation to the implementation of evidence or research outputs (n=434); for example researchers undertook dissemination activities to communicate research outputs to stakeholders and research users. A small number of case studies (n=10) described how researchers had put systems in place to capture research impact as it happened, such as monitoring changes in routinely collected data.

4.2 Contextual leverage

The included case studies cover a huge range of research contexts and topics for research. Research impact is not merely a function of the research outcomes themselves, but is likely to relate at least as strongly to the context within which those outcomes are generated and delivered. The term 'contextual leverage' is used here to mean researchers consciously making use of factors in the wider research context to stimulate research impact.

Socio-economic factors related to the research discipline and topic area of LGM case studies but there were some consistent factors that case study authors reported. Most notably, authors described how favourable conditions for collaboration occurred, such as winning competitive funding or professional/research groups recognising the need to address identified problems (n=882 case studies). Socio-economic–political factors tended to be important influences at research design stage but could also provide momentum for research that was under way.

Political, professional or public agendas had helped to promote research studies by directly linking research outputs to political figures or campaigns by professional bodies on issues. Other case study authors described how linking the research to public/user interest (n=278) such as media campaigns or consumer groups helped to energise for change.

Wider strategies or plans for change were described as a way of generating impact (n=134) by identifying national policies or recommendations that required research users such as health or social care providers to take action.

Scale of potential benefit could be a useful factor in promoting research (eg, the societal benefits of overcoming poverty or inequality) in the context of a lack of availability of existing research outputs to meet a perceived need. Some case study authors reported use of indicated outcomes, such as estimates of the scale of impact and/or potential beneficiaries (eg, population prevalence) to gain support or resources for the research.

4.3 Designing research for impact

Choices about research approach were described as influencing research impact. For example, the case study data suggests that researchers using critical or action-orientated research methods may be more likely to achieve impact in organisations or systems of governance. A case study from Queen Mary, University of London was specifically designed to address underrepresentation of women in union leadership. The case study demonstrates three sets of impact: changing policy and practices to improve women's representation in the union's leadership and decision-making structures; career development, activist development and new networking opportunities for women union leaders/activists in the UK and USA; and increased action on improving women's representation in unions.

Planning impact involved predicting the types of benefit and beneficiaries of the research, identifying target audiences and research users, setting objectives for impact, planning opportunities to maximise impact and allocating resources for impact activities. While planning impact is increasingly being requested at proposal stage, very few case studies actually reported on such activities.

Knowledge-transfer partnerships offer a way of designing partnerships with research users into research. In a case study of research on micro-financial institutions at the University of Salford, impact was supported through the use of two knowledge-transfer partnerships (KTPs). The KTPs enabled sharing of knowledge between the researchers and stakeholders to improve outcomes for end-users of financial services.

Planning for progressive or incremental impact through roll-out, phases or levels of the research spread impact. For example, research from Coventry University on organisational change and leadership and their impact on organisational well-being has been progressed at four strategic levels: impact on management and leadership practice generally; direct influence on management and leadership education and practice, direct impact in organisations that have used the research to improve business practice; and commercial impact.

4.4 Stakeholder engagement

Themes within the included case studies suggest that stakeholder engagement can include stakeholder identification, selection, recruitment and involvement at any stage of the research process. Research users are the people who currently use, or may use in the future, LGM research outputs, for example policymakers, service providers, leaders, managers, educators and practitioners.

Engaging stakeholders early in the planning of research can support applications for funding and enable the undertaking of the research, which builds towards the potential for research impact. In a case study carried out by the Open University Business School, researchers have built up strong stakeholder engagement at different levels of health-care policy and practice to achieve political impact.

Participative working stimulated impact through close interaction between researchers and research users with the research. In a case study from the University of Liverpool, the researchers used an action-learning approach to encourage critical reflection amongst owner–managers and the acquisition and application of new knowledge. The resulting impacts were on management practices and processes, and organisational performance.

Research users perceive a benefit of the research (n=168) such as gaining shared learning or knowledge exchange within or between organisations. Research users being responsive to stakeholders (such as policymakers or service regulators) was described as an important factor (n=42) in whether research users were willing to become involved with research studies. For example, when research users were already considering or taking steps to respond to guidance or recommendations, this enabled partnerships to be formed around defined research topics.

Research users' awareness of public/user views, such as understanding of the market or outcomes that matter to end-users, was beneficial for gaining the latter's involvement and support for the research (n=156). When research users were involved in research design, this could generate questions that could lead to detectable change in organisations. Research users were often the partners in collaborations that perceived a need to change or saw a gap in the market that the research could address.

Research users' participation in the research could be an indication of readiness for change and a sign that research outputs would be more likely to be taken up or implemented. Researchers were better able to identify the types of research outcomes that might be beneficial in situations where research users had a good understanding of the challenges or problems faced and expressed a need for certain types of research evidence or outputs.

Maintaining the engagement of research users was supported by seeing the benefit of early results or the positive gains other research users had achieved (n=38). A further factor was the role of research users in the implementation of research (n=64); for example, research users may be involved in facilitating change management or there were receptive conditions for the implementation of research outputs.

4.5 Public/user involvement

Involving users in deciding the aims or focus of research may build towards targeted research impact. Public/user involvement in LGM research can include consultation or collaboration with members of the public or end-users or more active forms of direct involvement. For example, social work and social policy research by the Social Policy Research Centre (SPRC) has enabled minority-ethnic organisations and other local service providers to gather evidence and develop initiatives and practices better adapted to the needs of service users. This has included the training of community and peer researchers, networking and consultation events and a wide range of participatory methods. Research with BAME organisations and community service providers has enabled them to better identify with the needs of their clients, set priorities for future service provision, and develop sustainability strategies, including funding, service commissioning, partnerships and networking.

Gaining public/user backing may help to validate research processes and spread impact amongst similar groups of the public/users, for example through voluntary organisation networks. An example is research at Newcastle University, which has resulted in the development of a model of social accounting co-produced with different third-sector organisations. A number of organisations have implemented the model, resulting in improved practice through a better understanding of their stakeholders' perspectives.

Informing how research users engage with end-users – public/user involvement can also inform the way that research users such as health services engage with end-users. For example, the People in Public Health (PIPH) study undertaken by Leeds Metropolitan University has brought together evidence on rationales for lay engagement, effectiveness and models of support. The research has had an impact on health policy, national networks for public health and public health practice. Strategic work has also been undertaken to engage members of the public directly in the research programme, which has informed new methods of participation.

Peer-led research – public/user involvement in LGM research includes service-user involvement in the design and development of service-focused organisations. One example is health and social care research undertaken by Anglia Ruskin University involving peer-led self-help groups and peer-led citizen research groups. The research demonstrates that marginalised groups can undertake their own research given the right support and training. The impact of the research is evidenced by national and local guidelines, national and local training initiatives, the sustained commissioning of two service-user/citizen research groups and related service improvements, and increased social capital and skills for the citizens involved.

User-led research – public/user involvement can also be enabled through user-led organisations' involvement in developing user-led training or user-led services; and through spreading expertise about public/user involvement, eg through shared learning events or secondments of research experts in public/user involvement. Work undertaken by the Centre for Social Action (CSA) at De Montfort University has improved publicly funded services through service-user engagement in both research processes and service delivery. The social-action methodology for practice and research undertaken using this participatory approach has had an impact on services and policy internationally, nationally and locally.

Making use of user networks to spread impact; for example, in the Children Decide project at the University of East Anglia, involving the public/users in building social connections in communities has helped to spread the impact of research to targeted communities. The project explored the constraints encountered by both children and teachers in sharing decisions and in carrying out action research, and identified two dimensions of impact: the teachers' thinking and action, as well as children's research and decision-making.

4.6 Mechanisms for exchange

As described in Chapter 2, mechanisms are perceived to be events or actions to support productive interactions between researchers and non-academic people or groups in the research process. Thematic analysis reveals 20 types of mechanisms reported in the case study data. These are presented below, beginning with the most commonly described mechanism, public debate.

Public debate helps to disseminate research more widely and to stimulate public debate, for example on research about organisational well-being (Coventry University). Media coverage was another way to stimulate public debate about employee well-being (University of Bedfordshire). The data also illustrates the value of research to inform and shape the terms of debates, for example in relation to the concept of the glass cliff in understanding women's leadership positions (University of Exeter). Research can also foster or enhance debates, for example on diplomatic processes globally and in the European Union (Loughborough University). Other examples of research outputs shaping debates are debates about devolution in the UK (University of Ulster), issues of employee voice, and shaping the development of policy frameworks and particular policy initiatives in the UK and abroad, as well as employment practices (Middlesex University). Research outputs for enhancing organisational change have been cited in public and practitioner debates (University of Southampton), or used to strengthen campaigns to shape and inform critical public debate about gender and sexuality and improved democratic participation in such debate (University of Kent).

Engagement is associated with stakeholders, research users and the public at different stages of the research. Public engagement in the research can improve research outcomes, for example, public engagement events have increased organ-donor registrations (University of Bedfordshire). Case studies indicate the impact of research-user engagement on research-user outcomes, for example, practising FE leaders and managers enhanced their knowledge and understanding of leadership in theory and practice (Lancaster University). Engagement with the research process helped FE leaders and managers to build skills, confidence and self-esteem and increase awareness and knowledge. Engagement was also described as involving stimulating engagement beyond the research; for example, research on employee engagement was used to shape 'engage space events' for line managers to support them in their role in engagement (Kingston University). The case studies indicate that engagement is often a precursor to other mechanisms for exchange (eg, knowledge-transfer). For example, research has benefited individual SMEs through direct engagement with universities, providing access to new sources of consultancy, placements and various types of formal and informal knowledge-transfer (University of Bedfordshire).

Discussion is a mechanism that stimulates early interest in research, prior to use of other mechanisms (eg, debate or consultation). For example, conference discussions have informed policy debates on the learning and skill needs of third-sector workers (University of Southampton). Discussion through the press raises professional interest, for example on the challenges of HR education (Lancaster University). Discussion of research may be through social media, for example on ways to give future generations a say in current policy decisions (University of East Anglia). Formal discussions may be used as a precursor or adjunct to political debate, for example on the resolution of historical inequalities in post-conflict societies (University of Ulster). Internal discussions within organisations may inform understanding, for example on management, recruitment, career progression, reform and reform management (University of East Anglia). Discussion papers may stimulate interest in research ideas, for example on the idea of 'guardians of the future' in policymaking (University of East Anglia).

Informing can include informing political or public debate, and informing practice, design or developments in commercial or public sector organisations. It can mean the research is informing the work of research users, for example in the case of Acas, which plays a pivotal role in shaping British employment relations (University of Central Lancashire). It may also mean researchers informing journalists' reports, such as public opinion on Welsh devolution (Cardiff University).

Influencing includes political, professional and public dimensions, for example, influencing the policy debate about the impact of part-time employment on women's careers (University of East Anglia) or influencing the focus of the UN's work on human rights by intelligence agencies (Durham University). It can be unclear whether authors are describing the influencing role of the research itself or of the researchers involved.

Research has influenced business and industry standards, for example on reducing fraud (Oxford Brookes University). Influencing may also be closely related to other mechanisms (eg, engaging and debate), for example on health professionals' treatment of their patients and of clients in the mental health services (Durham University). It may also describe outcomes of the research, for example influencing thinking and ways of seeing important social and economic issues using poetry (Oxford Brookes University).

Decision-making is closely intertwined with supporting decision-makers or their decision-making, for example, in patient and practitioner shared decision-making about treatment. It is therefore difficult to draw out insights specifically about the role of decision-making within LGM research in generating research impact. However, the use of shared decision-making within the research process can help to secure research funding, for example research about patients' information needs (University of Salford).

Feedback appears to be a mechanism for researchers to understand the validity of their research and the nature of the impact on research users. Written feedback about training sessions on equality in the workplace showed how research influenced managers' thinking and practice (Oxford Brookes University). Feedback about an exhibition on mental health histories showed the transformative effect of the research on community-building (University of Sheffield). Feedback was also a useful mechanism for researchers to understand research users' level of engagement with research outputs, such as student experiences of training events (University of Sheffield). Participant feedback is a useful mechanism when formal evaluation of research outputs is inappropriate, for example, in mental health feedback about interactive workshops for people who hear voices and their carers (Durham University).

Consultation is strongly associated with knowledge-transfer in this sample of case studies. Consultation between researchers and research users is a mechanism for research users to interpret and make use of research findings, for example on policies for supporting people who are financially excluded (University of Salford).

Consultations between researchers can help to develop research outcomes, for example in research on gender representation in middle and senior levels of responsibility and decision-making in the public and third sectors (University of East London). The mechanism can also include researchers contributing to formal consultation exercises, for example on the powers of reorganised local government (University of Ulster).

Demonstration of research is only described in very few of the included LGM case studies in terms of an actual demonstration event. Far more often it is used in relation to demonstrating evidence or how the research demonstrates a point or an issue. Research results may demonstrate effectiveness, for example Cardiff University's demonstration of the effectiveness of lymph-node biopsy has helped establish the technique as the global standard of care. Hands-on demonstration helps to engage members of the public; for example, participants at a cosmology event experienced a wide range of activities to learn about research (University of Portsmouth).

Knowledge exchange is a useful mechanism in research on sensitive topics. For example, in research on transitional justice, a collaborative summer school enabled knowledge exchange with local and international NGOs and policymakers (University of Ulster). A further example of knowledge exchange in resolution is the Knowledge Exchange Seminar Series, which seeks to promote evidence-led policy and law-making within Northern Ireland (University of Ulster). Conflict resolution 'master-classes' have been delivered to networks of SMEs across Lancashire as part of an ESRC-funded programme of knowledge exchange (Knowledge Network for Business) (University of Central Lancashire). Knowledge exchange through the organisation of high-profile events between academics and policymakers has shaped international policy and practitioner debates on Chinese domestic and international politics (University of Warwick). Knowledge exchange may also play a role in enhancing the impact of community-focused research. For example, in research on housing systems, economists have sustained collaborative research and knowledge-exchange analysis with key stakeholders and user groups (University of Glasgow). In other research, knowledge exchange is at the centre of a community participation in research. For example, the Centre for Health Promotion Research maintains strong links with local community organisations and in 2013 established a Community Campus Partnerships initiative to promote knowledge exchange between professionals, researchers and community members (Leeds Metropolitan University). Other case studies mention the role of a knowledge exchange manager (Cardiff University), knowledge exchange workshops (University of Derby), and the Hefce-funded Centre for Knowledge Exchange (Anglia Ruskin University) in generating research impact. Researchers at Newcastle University conducted in-depth research into the role of knowledge-exchange mechanisms and intermediaries between environmental research and practice. The findings contribute to understanding of interdisciplinary research and knowledge-exchange activities, including methods and approaches for collaboration between social and natural scientists, the benefits of interdisciplinary research in enabling socio-technical innovation, the ways in which research findings impact on policy and practice, and the importance of stakeholder engagement during the process of knowledge production itself.

Interaction was described as being a mechanism for raising the profile of research, scaling up impact or making research accessible to non-academic audiences. For example, interaction with policymakers and practitioners has raised the profile of regeneration internationally and in the UK across government, investment fund managers, advisers and investors (University of Ulster). In research on heritage management, interaction with intergovernmental organisations led to scaling up of impact (University of Kent). Interaction is a way of informing policymakers about research findings, for example about the labour market (University of Warwick) or religion and belief (University of Derby). Interaction can spread impact through advice or training, for example on equality issues (Oxford Brookes University). Interactive sessions can also help to transfer knowledge. For example, in research on gender equality in the public sector, participants indicated that they gained knowledge of gender and public leadership initiatives and strategies in the context in which they were working (University of East London). Research processes may also enable interaction and dialogue between research users. For example, research on cultural identities has established new channels for cultural diplomacy to strengthen dialogue and positive relations in times of turbulence and change (Middlesex University).

Discourse enabled the exchange of perspectives or knowledge, such as transforming policy discourse, for example about early years education (University of Oxford), leadership in SMEs (Leeds Metropolitan University) and ethical socialism (Oxford Brookes University). Discourse also included injection of new insights into professional discourse. For example, in the construction industry, participation in discourse about team expertise resulted in greater understanding of the character of better practice (Birmingham City University). Influencing public discourse related both to processes of impact (eg communication) and to research outcomes, for example public discourse and understanding about higher education in society (University of Cambridge). Discourse also includes informing public discourse by introducing alternative solutions or ways of approaching issues; for example, research on green economics has made influential contributions to public discourse around the understanding of alternative economic models (University of Roehampton).

Shared learning is closely related to research on education and organisational learning. Case studies described the impact of research participants learning from each other. For example, in research on employee engagement in organisational change, all members were found to have made adjustments to their change practices as a result of research conducted within their own organisations and their learning from others (University of Bath). In research on women's leadership, a development course had immediate benefits for participants in the form of shared experiences and learning, as well as longer term benefits (Queen Mary, University of London). In health research, an online programme where patients are collaborative partners with clinicians had enabled self-management skills and techniques. Having groups of participants at different stages of illness provided useful for peer learning (Cardiff University). Several case studies reported achieving impact through the provision of action learning to research-user organisations. For example, using action-learning sets, the University of Liverpool Management School Leadership Enterprise And Development (LEAD) Programme encouraged owner–managers to adopt appropriate leadership skills to promote organisational learning as a basis for improving organisational performance. In another example, the Northern Leadership Academy supported 10 educational partners across the north to provide action learning to SME owner–managers (University of Leeds).

Connection includes connections between researchers and research-user organisations, connections between organisations, connection of ideas, connection of organisational role with ethical practice, emotional connection and social connections. Newcastle University's influential role on the UK government's agricultural policy was helped by the quality of its connections in the policy community. A case study of research on SMEs showed that research has developed unique insights on how peer-to-peer interactions can enable the connection of SMEs with the research base (ie, universities, research institutes, etc) (University of Brighton). Connection required enabling SMEs to identify a precise set of needs and requirements and finding the right knowledge provider to connect with. The data also suggests that research impact can be enhanced through understanding and supporting connections between research-user organisations. For example, a case study of how civil society organisations (such as NGOs and trade unions) link to global governance institutions suggests that mutual connections are important and depend on the actors involved, resources, incentives, policymaking procedures and institutional cultures (University of Warwick). Another perspective of the mechanism of connection is the connection of ideas through research, for example in public relations research, how practitioners understand the connection between certain types of knowledge and expertise in relation to their work (Queen Margaret University). In research on professional ethics, connection focused on enabling research-user organisations to connect with theoretical ethical principles (University of Leeds). Connection was also mentioned in research on museum practice in relation to forging emotional connections between Black, Asian and Minority Ethnic groups (BAME) groups and education of the local White community about the reality of migration (Durham University). Creating social connections was also central to research on the social integration of refugees in Scotland (Queen Margaret University).

Linking is a mechanism that can link research to debates. For example, by linking the debates about evidence-based medicine (EBM) with the quality movement and other policy initiatives, linking enhanced the impact of research on clinical decision-making (Manchester Metropolitan University). The impact of research on management thinking has been extended by interlinking business knowledge with personal transformation (University of Sunderland). Research impact can be extended by linking researchers working across universities and countries. For example, in collaborative European space research, impact has been achieved by linking all parties together in distributed virtual workspaces (University of Salford). Researchers have developed methods for linking academic communities with policy- and practice-focused research-user organisations, for example linking academic researchers into the development of EU trade policy (University of Warwick). Another example is the Universities' Police Science Institute (UPSI), which is a model for linking the police service with academic research (Cardiff University). In town planning, research has linked academic planners and practitioners through collaborative projects (Newcastle University).

Civic engagement was only mentioned in a very small number of case studies (n=14). A case study on leadership of learning impact in further and higher education used research on the topic of civic engagement of citizens who are seen as vulnerable (Oxford Brookes University). In another case study of research on well-being, impact was supported by a researcher being shortlisted for an award for civic engagement (University of Exeter). A symposium organised by the Cultural Policy Center and the Office of Civic Engagement at the University of Chicago spread research on cultural diplomacy and value (City University London). Other case studies concerned civic engagement and political representation across divided societies (University of Kent) and young peoples' civic engagement and political participation (Royal Holloway, University of London).

Secondment was described in a small number of LGM case studies (n=13). These reported on the secondment of researchers to political, commercial or public sector (research-user) organisations. Secondment was sometimes cited as an indicator of the impact of the research or researcher. For example, research on devolution led to a secondment to the Assembly Commission in Wales (University of Liverpool) and research on participative democracy led to the secondment of a researcher as chief speechwriter to the leader of the opposition, Ed Miliband (Oxford University).

Secondment was also seen as a mechanism through which research impact was achieved in research-user organisations. For example, research on modes of innovation and the most appropriate ways of measuring innovation achieved its impact through a secondment to the Department of Industry, Universities and Skills (Birkbeck, University of London). Secondment appears to be closely related to knowledge exchange; for example, in a knowledge-exchange partnership on low-carbon policies, seconded researchers worked with policy partners to develop common understandings of the issues through observation of the policymaking process and through action research (University of Liverpool). Secondment also facilitated research impact through capacity building (knowledge and skills) within research-user organisations. For example, secondment to the African Development Bank led directly to knowledge and capacity building on regulation in Africa (University of Birmingham). Secondment was also used as a way of illustrating the commitment of the researcher to spreading impact within research-user organisations which could help to gain support for the research. For example, secondment to the National Institute for Health Research spread learning about interactive models of knowledge-transfer (University of St Andrews). A researcher secondment to the Royal Town Planning Institute (RTPI) provided a unique opportunity for academic research and learning to feed even more directly into the development of planning policy (University of Reading).

Co-creation and co-production are mechanisms for building knowledge through collaboration between research users and other non-academic partners. Research on responsible innovation has used co-creating and adaptive learning to catalyse organisations to reflect on their own responsibilities, policies and practices (University of Exeter). Research on the use of social marketing techniques in business co-creation workshops engaged social marketing SMEs and related stakeholders to spread knowledge and learning (University of Exeter). Business and management research at Lancaster University built on a collaborative model has enabled societal impact to extend to multiple sectors of the business community.

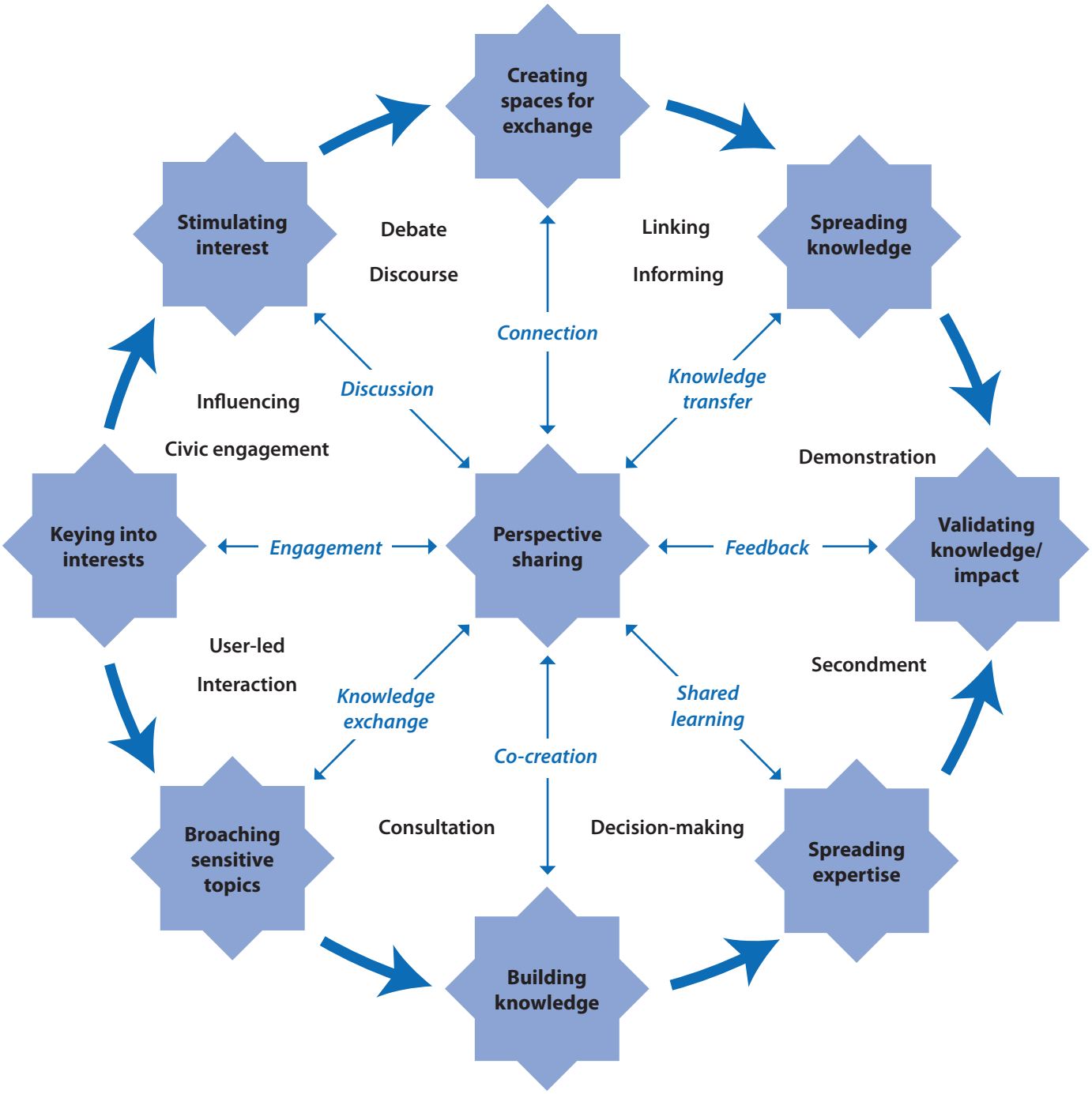
User-led research or associated initiatives are described in a small number of case studies with user-led organisations. For example, the project Making Involvement Matter in Essex (MIME) was delivered in partnership with a user-led training organisation Advocacy Really Works, which enabled the research team to engage a wider group of service users and carers in the research (Anglia Ruskin University). Researchers have also worked with research users to develop user-led resources; for example, chronic kidney disease research informed an information hub tailored to meet the needs of patients by patients (University of Salford). In another case study on transport research, researchers have developed methods of user-led transport design to create new forms of public transport (The Open University).

Figure 9 illustrates how these identified mechanisms for exchange are interrelated. Using findings from a keyword analysis of the mechanisms identified, it is possible to reach more general findings about the use of the identified mechanisms. Although different mechanisms do not map directly onto different functions, some overall trends can be seen as follows:

- *Stimulating interest:* Over two-thirds of the case studies describe mechanisms for stimulating interest in the research, eg, influencing (16.9%, n=221), debate (33%, n=432) or discussion (21.4%, n=280).
- *Keying into interests:* Nearly a third of the case studies identify mechanisms for keying into the interests of stakeholders, research users, researchers or end-users, eg, engagement (31.8%, n=416), civic engagement (1.1%, n=14) or user led (0.2%, n=2).
- *Broaching sensitive topics:* using mechanisms to support interaction (6.5%, n=85) can help to broach sensitive subjects or bring the perspectives of excluded or marginalised groups into LGM research.
- *Spreading knowledge:* Nearly a third of the case studies describe mechanisms for spreading knowledge, eg, informing (18.2%, n=238), demonstrating (9.8%, n=128) or knowledge-transfer (10.4%, n= 136).
- *Building knowledge:* Nearly a third of the case studies describe mechanisms for building knowledge, eg, consultation (14.8%, n=194), co-creation (0.6%, n=8) or shared decision-making (16.1 %, n=211).
- *Validating knowledge/impact:* Less than a fifth of case studies describe mechanisms for validating knowledge/impact, eg, feedback (15.1%, n=198).
- *Creating spaces for exchange:* Just over a tenth of the case studies describe mechanisms for creating spaces for exchange, eg, through discourse (5.3%, n=69), linking (3.7%, n=49) or connection (3.8%, n=50).
- *Perspective sharing:* Very few case studies describe mechanism for perspective sharing, eg, interaction (6.5%, n=85) or knowledge exchange (7.4%, n=97).
- *Spreading expertise:* Very few case studies describe mechanisms for spreading expertise, eg, shared learning (3.8%, n=50) or secondments (1%, n=13).

These findings reveal the mechanisms through which research impact might be achieved and the types of functions that mechanisms serve.

Figure 9: Mechanisms for exchange



4.7 Developing impactful outputs

Research output factors that may support impact include stakeholder backing; for example, research outputs were advocated or funded by senior stakeholders (n=77). It was also important that research outputs were considered safe, economical or acceptable to the public/users (n=29). Some authors described how research outcomes had utility or were 'fit for purpose'; for example, research outputs met research users' needs in an effective or efficient way (n=159). Other authors suggested that research outputs aligned with strategies/plans in the research context or research users' plans for change (n=14).

Related factors were whether research users felt a sense of ownership over the research output; the research outputs set out a clear aim, objective or purpose; and outputs were seen as being clearly informed by research evidence and expertise. Some researchers had developed research outputs with research users (n=112) to produce outputs in a format and language that were acceptable and accessible to target groups of research users. Research outputs that were accessible to research users (eg, short guides or web-based applications) and/or were supported by further information or sources (eg, reference databases)

helped to support uptake. It was advantageous for assessing research impact if research outputs clearly led to detectable change, such as implementation of new systems in organisations.

The case studies suggest that framing or translating research outputs in ways that resonate with research users can support impact through improved uptake and implementation of research outputs. For example, researchers may develop key messages from the research for target audiences or seek to develop outputs that provide actionable information, guidance or recommendations to research users. A case study of business owner–managers research at the University of Leeds examined how managers acquired knowledge and identified ways that they could learn more effectively by framing practical education and business support in ways that appealed to the research users.

Communicating research can also involve more in-depth work to develop research outputs that connect with the language, communicative resources or modes of communication of research users or end-users. A case study example from Birkbeck College builds on research about linguistic politeness, intercultural pragmatics, institutional communication and organisational discourse, sociolinguistics and multilingualism to bring about impact on the communicative competence of young people. Understanding children's perspectives and preferences helped to target communications for greater research impact on these end-users.

4.8 Implementing and evaluating outcomes

For most case studies, implementation involved dissemination activities such as the development of summaries, briefings or web-based information about the research. Implementing research outputs included producing or adapting research outputs to support uptake by specific groups of research users. Researchers using applied research methods were the most likely group of researchers to make use of an implementation strategy to achieve impact, or to use a planned, separate phase or follow-up to the research. An example case study from Aston University illustrates how implementation of a systems-thinking-based model using a set of rules and guidelines has been achieved through applied research to change management initiatives. Outcome assessment involved planning to capture, record, monitor or evaluate the outcomes of the research. The types of measures that researchers have used are explored in Chapter 5. Researcher-led assessment activities helped to show the impact of the research but they also encouraged stakeholders or research users to focus on achieving particular outcomes. Focusing on certain outcomes helped to raise awareness of the goals of the research. In an example from the University of Nottingham, outcome assessment was focused on raising the standards of teaching, and pupils' learning and achievement with widespread impact. The research provided new insights into the complexity of teacher development and has been used by government policymakers and school leaders in the assessment of professional competencies and targeting of support.

According to these findings, eight impact processes can be employed to move from a present position and conditions for research impact towards a more strategic position and supportive conditions for research impact, illustrated in Figure 10.

Figure 10: Impact processes

Key learning points

- Collectively, these accounts of how LGM case studies achieved impact illuminate the types of impact processes that researchers have used. They reveal that the processes of impact generation are closely related to research processes, such as design, undertaking and evaluation of research. They also show that researchers are investing time and resources to maximise the impact of their research studies or outputs alongside generating research knowledge.
- What emerges from this analysis of routes to impact is that multiple, simultaneous processes contribute to research impact. Research impact is not only related to the research; the actions of researchers, the conditions in which research takes place and the processes of interaction that researchers use are also crucial to research impact.
- Eight impact processes can be employed to move from a present position and conditions for research impact towards a more strategic position and supportive conditions as follows:

1. *Researcher impact skills:* To be successful researchers can develop their own skills and experience in relation to research and achieving research impact, eg, research design skills, skills in impact planning, skills in participatory working, communication skills, as well as their subject expertise/roles. Researchers also need to focus on forming research collaborations, networking and communication skills to draw upon the skills, knowledge and expertise of their colleagues and research partners. Researchers can consider intra-organisational teamwork, interdisciplinary collaborations and international collaborations, formal financial and/or in-kind collaborations to enhance access to information, co-production of knowledge or the implementation of the research.

2. *Contextual leverage:* Researchers often focus on their own actions to 'push' research impact, rather than taking a broader view of the conditions that surround their research. By taking time to examine the research context, researchers can identify 'pull' factors that may help them to gain contextual leverage, eg, by identifying favourable conditions for collaboration, keying into political or professional agendas, making a link to existing strategies/plans for change, identifying priority areas for research, or gaining indications of the scale of potential benefit or outcomes for beneficiaries.

3. *Designing research for impact:* Consider the use of critical or action-orientated research methods to intentionally change particular outcomes as part of the research design. Impact planning could include predicting the types of benefit and beneficiaries of the research, identifying target audiences and research users, setting objectives for impact, planning opportunities to maximise impact, allocating resources for impact activities, and planning progressive or incremental impact through roll-out or phases of the research.

4. *Stakeholder engagement:* Research stimulates change when stakeholders and research users contribute their knowledge by asking the right questions, in the right ways, and developing research outputs that are fit for purpose. Researchers can give attention to issues of stakeholder identification, selection, recruitment and involvement to support applications for funding and to enable the undertaking of the research. Research users are likely to need information and support to participate in the research, to communicate their needs for evidence or research outputs and to have a role in implementation.

5. *Public/user involvement:* Involving members of the public and end-users in research can mean research is more likely to meet the needs of such groups. Researchers can make use of consultation, collaboration or other approaches to involve individuals or members of consumer or voluntary groups. Involvement can help to gain public/user backing for research outcomes, capture the lobbying power/influence of user-led organisations, support access to user networks to spread research impact, and enhance research practices and researcher knowledge and skills.

6. *Using mechanisms for exchange:* Having got support behind the research, find ways to achieve productive interactions by employing mechanisms for exchange. Numerous mechanisms exist for stimulating interest, keying into interests, perspective sharing, building knowledge, spreading knowledge or expertise and validating knowledge/impact. For example, consider the use of events, debates or activities to engage stakeholders, research users or users/the public and to stimulate impact through close interaction with the research.

7. *Developing impactful outputs:* Research outputs are most successful when they have stakeholder backing, are acceptable to the public/end-users, have utility/are fit for purpose, align with existing plans for change, provide a sense of ownership to research users, convey a clear message with credibility, use familiar language/formats, are easy to take up, and have the potential to generate detectable change. Develop research outputs that have key messages and actionable information or guidance that resonate with research users. This will support impact through improved uptake and implementation.

8. *Implementing and evaluating outcomes:* Research outcomes do not just happen; they need research outputs to be implemented. Implementing outputs includes dissemination or adaption of research outputs to support uptake. Consider the use of an implementation strategy to achieve impact. Dissemination can include the development of summaries, briefings or web-based information about the research, as well as in-depth work to develop research outputs that connect with the preferred language, resources or modes of communication of research users. Assessing research outcomes includes planning to capture, record, monitor or evaluate the outcomes of the research to show impact but also to encourage stakeholders or research users to focus on particular outcomes and raise awareness of the impact of the research.

- It could be that other impact processes and mechanisms exist but are not reported in this data. Different impact processes or mechanisms may be more important in different fields of LGM research.
- Given that public and user involvement is increasingly becoming central to organisational decision-making and professional practice, it would be useful for subsequent iterations of REF to specifically ask about public/user involvement in relation to research impact.

The third part of the findings explores how the outcomes and processes of LGM research impact can be evidenced and assessed. Chapter 5: Methods to evidence and assess impact.

Chapter 5: Methods to evidence and assess impact

5.1 Techniques case study authors have used to evidence impact

The case studies provide useful insights into ways to evidence the impact of LGM research. Across the data, case study authors used a number of useful techniques to evidence LGM impact. These are described in this section under the following headings derived from themes in the case study data.

Useful techniques for evidencing impact are:

- Showing causality
- Use of measures and indicators
- Addressing issues of attribution and contribution
- Emphasising progression or spread of impact
- Showing systematic capture of impact information
- Presenting a tailored account using an active authorship style.

Showing causality

Some research designs are better suited for demonstrating the presence of a causal relationship, others are more appropriate for explaining such causal relationships, while some designs are more useful for describing political, social and environmental contexts. Research studies that aim to control for variables and use randomisation (experimental or quasi-experimental designs) are generally more suited to evidencing research impact than those that do not. LGM research tends to cover different decision-making, social and cultural contexts, which often suits qualitative approaches (observational designs), for example, cohort and/or longitudinal designs; case control designs; cross- sectional designs; surveys, approaches using interviews, focus groups, case studies, historical analyses, ethnographies, and political or economic analysis.

Randomisation is a useful tool for researchers to show the impact of research, for example on the economics of happiness and well-being (University of Warwick), the evidence for systematic health checks in England and Wales (Cardiff University), and the impact of policies for better treatment of employees with disability or long-term health problems (Cardiff University). However, LGM research does not always suit randomisation because it often involves self-selection of research users for implementation of interventions. Research approaches that value collaboration and self-selected participation are more likely to use purposive selection processes to achieve representation or inclusion, as was the case in research on working-age carers (University of Leeds). Researchers have used structured samples in research to improve community policing (Cardiff University) and rolling samples to track changes in public opinion on Welsh devolution (Cardiff University).

Use of measures and indicators

Findings of a focused analysis of the use of measures in the case study sample is presented in Annex 2. It shows that multiple measures of diverse research outcomes have been used to evidence impact. LGM research involves specific and general types of impact, such as team outcomes, drive and cohesiveness, organisational outcomes and organisational culture. Impact is embedded through different modes of operation involving a wide range of individuals, teams, institutions or sectors, and thus it may not be feasible or desirable for researchers to make comparisons of impact at these different levels. Hence the measures that are chosen to assess research outcomes (eg, measures that fit with research aims or the research users' priorities) may not always be useful for evidencing research impact (eg, measures that fit with research assessors' interests or priorities).

Impact of LGM research may also be evidenced by the use of indicators of impact (eg, influence) and implications (which may or may not have any detectable impact). However, the use of indicators and speculative implications are much less convincing than being able to show quantifiable effect using established measures. Authors of the case studies have sought to use measures, indicators and implications to evidence impact, and it was down to assessment panels to consider the relative value of the evidence and moderate claims to impact accordingly.

Addressing issues of attribution and contribution

The challenge of any system that evaluates research impact is to convey the impact of the research relative to the outputs and outcomes that result from the research. It is an issue that concerns both attribution and contribution. Attribution refers to the fractionated, or proportional, effort made by a research team to the creation of the outputs, whereas contribution is reflective of the ability to claim that outcomes or impacts have resulted from the research outputs, regardless of the relative amount of that contribution. 'It is an important distinction to make and often the two terms are used interchangeably'[249]. Case study authors have largely tackled attributions issues in the case studies by reporting on specific researcher input and activities towards impact (captured in accounts of the Underpinning research).

Claims to outcomes or impacts (contribution) can be more problematic when the impact of LGM and its outcomes extend beyond the actions of individual researchers or teams to include the multiple roles and dynamics between different players involved in the contexts in which LGM research is undertaken, for example in understanding gender violence in El Salvador (University of Glasgow). As most LGM research is undertaken in complex organisations or social contexts, it can be difficult to define or isolate the contribution of the research. This issue includes being able to make a distinction between 'the impact of LGM' and 'the impact of LGM research'. Authors have addressed this issue by trying to separate research effects from the effects of other LGM processes or initiatives going on at the same time as the research. One strategy was to stipulate the specific aims of the research in relation to policy or strategic agendas, for example in shaping disability policies in Europe (University of Leeds).

Emphasising progression or spread of impact

The impact of LGM research is often contextualised by rapidly changing organisational structures or priorities. This could mean that research impact is short-lived, subsumed or transformed. Authors of the case studies have addressed this issue by describing the spread of impact over time and by describing impact as incremental or cumulative (eg, building on, extending or informing). The impact of LGM research can increase over time but it can also be fluid and interactive with impact being achieved – or lost. However, authors are less likely to draw attention to loss of impact, circumstances of set-back or discontinuation in their accounts.

Showing systematic capture of impact information

In the case studies, some authors describe different systems they have used to capture research impact. These include:

- bibliometrics: collection of references to published literature (eg, using in-house databases or external bibliographic databases), including journal articles, books, book chapters, conference proceedings, reports, patents, etc. Databases usually contain a standardised set of information about the references, such as author, title, publication type and year of publication, which can be used to create citation impact metrics (eg, impact factor or h-index)
- altmetrics: article-level metrics such as how many data and knowledge bases refer to it, article reviews, downloads, or mentions in social media and news media
- document reviews: assessment of how the research contributes to an existing pool of knowledge (eg, through independent review or evaluation)
- interviews with research users: to obtain information or to access personal perspectives on the impact of the research
- feedback surveys: to provide a broad overview of the impact of participation in a particular programme or body of research. Systematic capture of impact information shows researchers have built up a body of evidence to support their claim to impact.

Presenting a tailored account using an active authorship style

A further way that authors have conveyed their claim to research impact is by fulfilling the requirements of the REF assessment processes. Authors have purposely tailored their reporting of research impact towards showing non-academic impact. The case studies are the end product of a long process of carefully considered claims and internal scrutiny. They are crafted narratives filtered by authorship and informal review. Reporting on impact requires authorship skills to tailor messages about impact to the specific requirements of the research assessor. In other (ie, non-REF) circumstances, reporting and assessing impact may focus on different aspects of research impact such as economic or policy impact which could require different skills and authorship styles.

249 Morgan Jones, M. & Grant, J. (2013). Making the grade: methodologies for assessing and evidencing research impact, in Dean et al (eds) 7 Essays on Impact, p29. DESCRIBE Project Report for Jisc. University of Exeter.

The case studies draw evidence of impact from external assessments, peer assessments, participant assessment and self-assessment, but all of the information is a secondary report constructed by case study authors. As a consequence, the transparency of reporting can be unclear, for example whether the focus is on only reporting positive impact rather than a balanced evaluation or inclusion of negative impact. Case study authors have addressed this issue by (i) making reference to sources to verify claims (eg, substantiating evidence), (ii) using impactful language to describe the research (eg, ground-breaking, seminal, vital, imperative, essential) and (iii) using grammatical construction and active voice rather than passive voice to place emphasis on the research impact in sentence structures (eg, the research impacted on society, rather than society was affected by the research).

5.2 Measures used in LGM research

The analysis described in this section aimed to identify the range of types of measures reported in the included LGM case studies. Examples of measures were identified using text mining on the keyword 'measure' in the Underpinning Research. Each case was examined in context to assess the type of measure, the context, and the stage of its development or use in the research. Cases concerning the use or development of strategic measures in policy or practice (rather than measures of outcome) were not included.

The synthesised data from 145 LGM case studies is presented in Annex 3. The information is organised by research contexts as follows: education (higher education, vocational training, secondary, primary), government, business/organisations, third sector/charities/social enterprise, health/healthcare/social care, children/early years, social/societal/crime, sports/leisure/tourism, transport/shipping, environment/community planning, and banking/finance/accounting.

Types of outcome measures reported within the data include:

- Performance (individual, group, organisational)
- Productivity (production, service efficiency)
- Behaviour (decision-making, choice, practices)
- Engagement (employee engagement, participation)
- Psychological (happiness, well-being)
- Learning (candidate attributes, student attainment, attitude)
- Experience (patient, client, older people)
- Perception (consumer)
- Policy (implementation, effectiveness)
- Intervention programmes (implementation, effectiveness)
- Clinical (assessment or diagnosis of physical symptoms, clinical outcomes)
- Safety (individual, organisational, operational)
- Economic (cost, cost effectiveness, cost savings)
- Social impact (social accounting).

Stages of use or development of measures included:

- Testing or critique of the limitations of existing measures
- Development of new measures or indicators
- Development of measurement techniques or technologies, questionnaires or indexes
- Validation of measures (reliability, construct, political)

- Application/use of new measures in the research
- Standardisation or commercialisation of measures
- Adaption or translation of measures for international audiences.

There is some conceptual overlap in current use of measures in some areas of LGM research. For example, measures of performance, productivity, behaviour and engagement could be further developed as key suites of measures for LGM research. Psychological measures of happiness and well-being are also promising but more diverse in their meaning and use in different areas of LGM research. Measures of learning, experience and perception could also be useful for evidencing types of impact at the end-user level.

5.3 Identifying beneficiaries of LGM research in higher education

Previously presented findings identified types of impact and developed a classification that can be used to categorise impact associated with LGM research. The notion of evidencing impact at different levels is developed further in this section of the report by integrating the findings with the beneficiaries of LGM research. Four levels of impact are identified: Stakeholder level, Researcher level, Research-user level, and End-user level.

Stakeholder level

Stakeholders are people directly influencing or involved in the research, for example policymakers, commissioners, regulators or assessors of the research. Stakeholders differ from research users because they have a different relationship to the research. Impact at the stakeholder level may not be recognised as research impact or may be undifferentiated from impact at the research-user level. Assessing impact at the stakeholder level involves looking up towards the relationships that frame and enable the research to occur. Understanding impact at this level can provide important insights into how research is initiated and supported. It is possible that impact at this level may be captured in stakeholder reviews, such as commissioners' reports about how research funding has been used. Impact at the stakeholder level could include changes in the funding, governance, management or assessment of research. Impact at this level is likely to link into the contextual factors that influence impact processes in the research, such as stakeholder engagement and political or professional backing.

Researcher level

Researchers are the people who are responsible for the governance and undertaking of research, which may or may not include collaborators in the research and user researchers. Examples of possible impact at this level could include: improvements in research infrastructure, research capacity, researcher skills or organisational performance in research assessment. Impact at the researcher level is not only impact on academic knowledge – it links to the researcher factors that can provide contextual leverage for research impact. Impact at the researcher level may include: improved ability to collaborate; expertise in interaction or empathetic competence; advances in understanding of stakeholders and attainment of influencing roles; development of skills and expertise in involving the public/users in research; development of research design skills, such as approaches and methods of knowledge generation that enable research impact; improved skills in impact planning and resource allocation for impact activities; expertise in participatory working (eg, shared decision-making, co-design or co-production) or know-how in communicating or working with sectors or groups of the community; improved researcher communication skills, including authoritative voice and personal communication capacity; researcher attainment of expertise/roles (eg, academic or technical credentials, track record or public media reputation); improved knowledge of research users, their needs or preferred types of research outputs; and more effective strategies to disseminate or implement research outputs, and better recording and monitoring systems for research outcomes.

Research-user level

Research users are the people who use, or may use in the future, research outputs, for example policymakers, service providers, leaders, managers, educators or practitioners. Examples of impact at this level include individual or group/organisational development or innovation, or improved performance. The majority of impact described by case study authors is at the research-user level. At this level, reported types of impact are most likely to involve research use (type I and type II impact), but effect on individual and groups/organisations of research users are also evident.

End-user level

End-users are the people benefiting from the outcomes of the research who may or may not be directly involved in the research, for example staff, students, patients, customers and business service users. Examples of impact at this level could be improvements in end-user experiences or outcomes. Impact at the end-user level may also include improved potential for future end-users to access services, knowledge or resources. This means end-users could include the general public or user groups who are not currently end-users. Potential types of impact at the end-user level in higher education contexts are explored later in this chapter. Table 16 applies these four levels of impact and findings on measures used in LGM research to categorise types of research impact on the HE sector and HEIs.

Table 16: Levels of LGM research impact in higher education

	Type I: Use of evidence	Type 2: Use of research products	Type 3: Effects on individuals	Type 4: Effects on groups/ organisations
Stakeholder level	Use of research evidence to inform HE sector or educational policy, working laws, strategies or priorities for HE research or LGM development, guidance or regulation of LGM in HEIs	Use of research products, eg, decision-making aids for allocation of HE resources or assessment of LGM research	Effects on individual stakeholders, eg, change in attitude, understanding or behaviours, improved individual performance or productivity	Effects on groups of stakeholders or their organisations, eg, costs of external funding or assessment structures of HE teaching or research, improved policy implementation or effectiveness in HEIs
Researcher level	Use of research evidence to develop research team strategies or policies, eg, on LGM research or research impact	Use of research products, eg, evidence-based researcher training or interventions, research methods or models of LGM, methods of participation for public/user involvement	Effect on individual researchers (and collaborators or user researchers) such as skills development, effect on attitude or behaviour	Effect on research groups or organisations, eg, research strategy development, increased research capacity or knowledge
Research-user level	Use of research evidence in the development of HEIs' organisational strategy, guidelines for leaders or managers, frameworks for recruiting students or assessing learning	Use of research products such as interventions, courses or training for HE leaders or managers, decision aids, toolkits or information resources for leadership development, tools for organisational improvement or benchmarking, support networks or technology	Effect on individual research users, eg, change in attitude, understanding or behaviour within HE, improved individual performance or productivity	Effect on groups of research users or improved organisational development, eg, improved organisational performance or productivity, eg, service efficiency, cost effectiveness or cost savings
End-user level	Use of research evidence, eg, use of research evidence to inform self-directed learning or user-produced guidance	Use of research products, eg, training, tools or information resources, peer-support networks	Effect on individual end-user awareness, attitudes, understanding or behaviours, eg, decision-making, choices or practices, improvements in student learning or attainment, as well as individual staff happiness, stress or well-being	Effects for groups of end-users of HE, eg, staff commitment or engagement, student attainment or experiences, effects on communities or sectors of the public who might use or benefit from HE

Given the breadth of LGM research impact on higher education, the challenge is to decide which outcomes are useful, practical and meaningful at different levels and for different types of impact on higher education. The multitude of types of impact that may be associated with LGM research suggests that a multitude of outcomes could be measured at each level of impact. For example, measures of HEI performance have been used in benchmarking to evaluate HEI regional contribution (Newcastle University). Measures of learner retention in the education system, educational attainment, successful transition from learning to work and

measures of work and life satisfaction have informed international career guidance (University of Derby). Measures have been developed for medical student selection (City University London) and assessment of competencies (University of South Wales).

The next section focuses on research impact at the end-user level in HE contexts.

5.4 Evidencing impact on end-users in higher education

End-users in HE contexts are the people benefiting from the outcomes of the research who may or may not be directly involved in the research. End-users in higher education contexts could be perceived as including staff and students, as well as businesses, communities or groups of the public who may use or benefit from higher education. Existing evidence of the impact of leadership on research, learning and enterprise in higher education 'is rather slim'[250]. Although there is mounting pressure on higher education to show impact at the end-user level, the present study does not suggest that one type or level of impact is better than any another, or that it is always feasible to expect impact at the end-user level.

In debates about research impact, end-user outcomes have generally been perceived as being synonymous with definitive outcomes[251,252]. Yet at the end-user level, different types of impact may relate to both research use and research effect. End-users can be affected by research use through the actions of research users; for example, students learn through the use of research evidence in course curricula. There can also be circumstances where end-users may also use research evidence or products; for example, students may use research evidence themselves without being told to by their tutors.

The effect of LGM research at the end-user level in higher education contexts could include changes in:

- Student experience
- Student engagement
- Student retention
- Student learning or attainment
- Staff and student well-being
- Staff skills or knowledge
- Staff commitment or employee engagement.

These types of impact are explored below.

Student experience

'Student experience' has received a lot of attention as a possible outcome of higher education (eg, through the National Student Survey). Research by the Leadership Foundation[253] has established what makes for a better student experience, including the relations between teaching, assessment and the quality of student learning; the impact of leadership on academics' teaching; the significance of student engagement and study time in determining student success; the relevance of curriculum issues; the relations between research and teaching; and the importance of recognising teaching performance. However, in the LGM case studies, only six case studies mention 'student experience' (searching in Underpinning Research and Details of Impact). Most of these case studies relate to UK university education. They concern: widening participation policy and practice (University of West London); changes in student funding for part-time undergraduates (Birkbeck, University of London); enhancing learning, teaching and assessment in universities (University of Edinburgh); healthcare professionals' education to enhance the safe care of patients (Anglia Ruskin University); and research concerning housing for student populations (Loughborough University).

250 Lumby, J. (2012). What Do We Know About Leadership In Higher Education? The Leadership Foundation for Higher Education's research, p2. London: Leadership Foundation for Higher Education.

251 Given, L. M., Kelly, W. & Willson, R. (2015). Bracing for impact: the role of information science in supporting societal research impact, in Proceedings of the 78th ASIS&T Annual Meeting: Information Science with Impact: Research in and for the Community, p 48. American Society for Information Science.

252 Greenhalgh, T. & Fahy, N. (2015). Research impact in the community-based health sciences: an analysis of 162 case studies from the 2014 UK Research Excellence Framework. BMC Medicine 13: 232.

253 Ramsden, P. (2013). Leadership for a better student experience. What do senior executives need to know? Stimulus Paper. London: Leadership Foundation for Higher Education.

Student engagement

In the case studies, 'student engagement' is considered in relation to: research on appropriate cultures for educational merger (University of Greenwich); student involvement in educational policymaking (Cambridge University); student uptake of science subjects (University of Manchester); student-as-producer principles in higher education environments (University of Lincoln); and policies and practices for student engagement and belonging (Edge Hill University).

Student retention

In the case studies, 'student retention' has been considered in relation to: research on BAME student degree attainment (Leeds Metropolitan University); diverse student groups in social-work education (Goldsmiths, University of London); graduate migration and retention (University of Edinburgh); research on mental toughness (University of Hull); and research on student equity, retention and success in higher education (Edge Hill University).

Student learning or attainment

In the case studies, 'student learning' is used to indicate or describe research impact in relation to: the effects of leadership on collaboration between educational organisations (University of Wolverhampton); curriculum design and assessment (Durham University); participative learning methods (University of Cumbria); self-organised learning environments (Newcastle University); educator capacity to use e-learning resources (University of Sussex); Personal Development Planning (PDP) (University of Worcester); inclusive education principles (University of Aberdeen); and policies and practices for student engagement and belonging (Edge Hill University). Impact on 'student attainment' has been considered in relation to research on reform of the school science curriculum (University of Leeds).

Current debates about the impact of higher education have identified the concept of 'learning gain' as one among a number of potential measures of higher education student outcomes. Hefce recently commissioned RAND Europe to review the literature on learning gain. The review[254] found that learning gain has been defined and conceptualised in a number of ways. In the report it is defined as the 'distance travelled', or the improvement in knowledge, skills, work-readiness and personal development demonstrated by students at two points in time. Methods can include using grades, surveys, standardised tests, qualitative methods and other mixed methods. The review found that there is some awareness of the learning gain concept in English higher education, but understanding varies across the sector, and use of measures is nascent. Learning gain was not a concept that appeared in the included LGM case studies and only one case study referred to 'learning gains' in primary school education (University of Dundee). The lack of use of this concept in the LGM case study data supports the RAND Europe review[255] recommendation of a need for robust piloting of the validity and feasibility of the various different approaches to measuring learning gain, with specific consideration of the utility of the concept in relation to LGM research in higher education contexts.

Staff and student well-being

Student, staff and community well-being is part of the Healthy Universities approach adopted by a growing number of HEIs within the UK and internationally (University of Central Lancashire). 'Student well-being' is also considered in initial teacher training on issues of behaviour, children's rights and health and well-being (University of Edinburgh) and policy and practice development on personal, social, health and economic (PHSE) education and school-based health services (Sheffield Hallam University), and research on mental toughness (University of Hull). 'Staff well-being' has been used in research on work-related stress and work–life conflict in higher education to reveal the mechanisms underpinning work-related well-being and ways in which this can be enhanced (University of Bedfordshire). The research involved longitudinal analysis of the working conditions underpinning the well-being of academic staff at a national level, their responses to ongoing change in the sector, and the implications for employees and higher education institutions. The Work-Related Quality of Life (WRQoL) scale and its derivatives have been used to assess and enhance the quality of working life in 10% of UK universities (University of Portsmouth).

254 RAND Europe (2015b). Learning Gain in Higher Education Report. Cambridge: RAND Europe.
255 ibid

Staff skills or knowledge

In the case studies, it is difficult to find specific examples of LGM research impact on higher education staff skills or knowledge (searching in Details of Impact for the terms 'university staff', 'academic staff', 'academic leader', 'lecturer' and 'teaching skills'). Types of potential impact of LGM research on staff skills and knowledge previously identified include: knowledge and understanding of leadership issues; authentic leadership behaviours; development of moral confidence; and networking skills. Research on work-based learning indicates positive impact on academic staff knowledge and skills (University of Chester). Improvements have been made in lecturer understanding of student assessment (University of Cumbria). The case studies describe impact on groups of higher education staff or HEIs, such as impact on the practices or processes of teaching, for example, improvements in placement practices (London Metropolitan University), academic professional development planning (University of Worcester) and university staff educational practice and cultures of enquiry (York St John University). The Lecturer Self-Efficacy Project (Bishop Grosseteste University) was initiated to develop a diagnostic instrument or resource to measure confidence in core academic functions (research, teaching, other) with a view to enhancing professional practice across the UK higher education sector. The project claims reach and significance in impact on practitioners and the development of professional services at organisational and departmental levels. Other research describes changes to the planning and delivery of higher education programmes, and in methods of student assessment but not specifically impact on staff skills or knowledge (University of the West of England).

Staff commitment or employee engagement

Types of potential impact of LGM research on staff commitment or employee engagement have been previously identified as including: improvements in employee engagement in organisational change; work motivation and performance; and working relationships.

This analysis has focused on identifying types of impact of LGM research at the end-user level in higher education. The case study data also contains relevant information about the impact of LGM research at the end-user level in other research contexts, including the Civil Service, Ministry of Defence, HR management, public relations and teacher training for general education. Further research could seek to examine and test the transferability of evidence about LGM impact from other research contexts to higher education settings.

While the findings of this analysis point to a number of outcomes for LGM research at the end-user level in higher education, it is not always going to be possible to isolate the effect of research on individuals or groups/organisations at this level. It is difficult to show direct causal links between LGM research and effect at the end-user level because research impact is affected by the interfaces between research/research users and researchers/end-users. The extract below from a case study on educational leadership development illustrates this point and provides a sound justification for focusing on type II impact (use of research products) at the research-user level.

Judging impact in leadership development is complex because there are so many significant intervening variables. It is very difficult to demonstrate a precise correlation and causality between following a leadership development programme, attending a course or reading materials and confidence that any change in effectiveness can be attributed to that experience. Therefore impact is being understood here as 'first level' i.e. engagement rather than 'second level' i.e. demonstrable change. Leadership effectiveness is the result of a highly complex series of interactions and there is no accurate methodology for isolating out the specific factors. However it can be argued that changing the processes and content that informs the design and delivery of leadership development is therefore, of itself, significant. Innovative leadership development, at the very least, contributes to the debate about sustainable educational practices.

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Key learning points

- The case studies provide useful insights into ways in which authors have evidenced the impact of LGM research. Case studies that made the most convincing claims to impact show causality, use measures and indicators, address issues of attribution and contribution, emphasise progression or spread of impact, show systematic capture of impact information, and present a tailored account using an active authorship style. Researchers can make use of these techniques to produce a strong claim to impact.
- Keyword searches identified 145 measures used by LGM case studies in different research contexts, measuring different types of outcomes, and at different stages of use or development. These measures could inform future research and assessment of impact.
- Four levels of impact are identified: stakeholder level, researcher level, research-user level, and end-user level. Impact at the stakeholder level involves looking up towards the relationships that frame and enable the research to occur. Understanding impact at this level can provide important insights into how research is initiated and supported. Impact at the stakeholder level could include changes in the funding, governance, management or assessment of research. At the researcher level, examples of possible impact include: improvements in research infrastructure; research capacity; researcher skills; or organisation performance in research assessment. Impact at the research-user level can include individual or group/organisational development or innovation, or improved performance. The majority of impact described by case study authors is at the research user level. Examples of impact at the end-user level could be improvements in end-user experiences or outcomes. Impact at the end-user level may also include improved potential for future end-users to access services, knowledge or resources.
- The effect of LGM research at the end-user level in higher education contexts could include changes in: student experience; student engagement; student retention; student learning or attainment; staff and student well-being; staff skills or knowledge; and staff commitment or employee engagement.

Chapter 6 uses these findings to develop tools for planning, predicting and assessing research impact.

Chapter 6. Tools for planning, predicting and assessing research impact

6.1 Adaptive System Framework for Advancing Research

This section draws on theoretical perspectives described in Chapter 2 and study findings to develop a CAS-based framework for LGM research impact. The section presents the Adaptive System Framework for Advancing Research (AS-FAR) and explains how it could inform different areas of LGM research (Figure 11). The framework is intended to inform LGM research in particular. It was conceived and developed from LGM research. However, owing to the breadth of the LGM field, it is likely that AS-FAR could be usefully applied to inform research about human interactions and social behaviour.

AS-FAR is a tool for researchers to make the most of the research contexts and processes within a research impact system. This framework is a helpful reminder of the importance of shifting away from a linear logic perspective of how impact is achieved. The benefit of this framework for impact planning is that it alerts researchers to think about the possibilities of planning routes to impact before research begins and predicting where impact may occur and be detected.

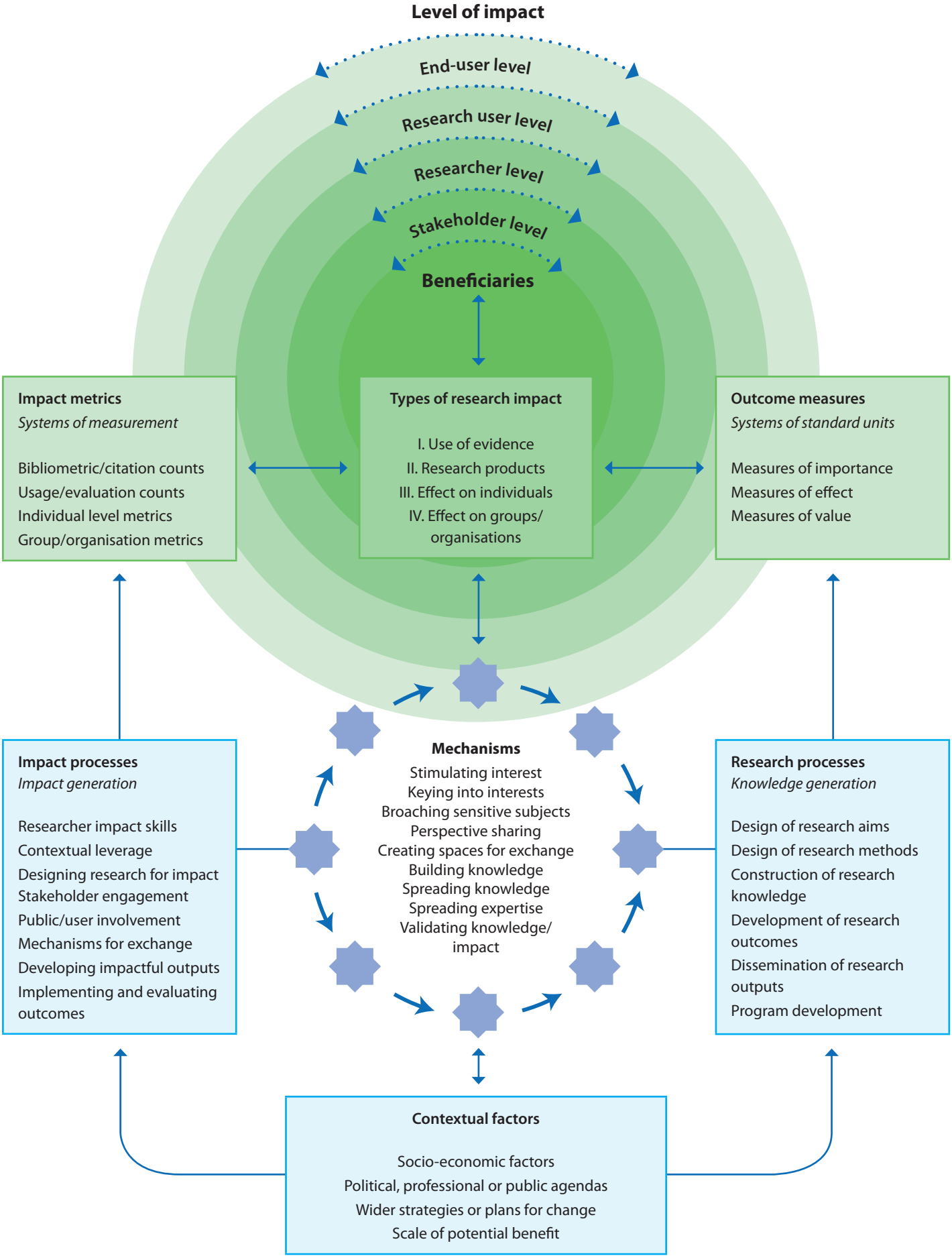
Each component shown in AS-FAR is part of a bigger process of research impact. At the same time, each component may be treated with a degree of autonomy and independence, such as work to develop a specific impact process (described in Chapter 4). Overly focusing on any one component may affect integration and alignment with research processes. Instead, optimisation requires 'moving through' the system to understand research impact in relation to a research study within a research context. The framework could be used to plan, judge or develop research practice, as described below.

Using AS-FAR for impact planning

AS-FAR provides prompts and descriptive categories that can help researchers to systematically consider a range of specific and verifiable impacts that might be achieved through the research. The framework could help researchers think through research design issues and implementation strategies or to look out for unintended or harmful effects. The standardised structure of the framework could facilitate comparison of approaches to research impact across projects or programmes and over time, which is useful from analytical, management and assessment perspectives.

The framework illustrates that researchers could in fact 'begin' their work on research impact at any point in the system, for example by developing mechanisms or impact processes with the intention of laying the ground for research impact before research processes begin. It could involve potential end-users of LGM research in knowledge-exchange activities or shared decision-making before the research formally starts and on throughout the research process. Such contact with LGM research end-users could help to establish a plan for research impact to guide the research and subsequent use of impact processes.

Figure 11: AS-FAR (Adaptive System Framework for Advancing Research)



AS-FAR is a simplified approach, but it could provide a useful framework to work with in planning a route through the complexity of research impact. Researchers can use the framework to visualise routes to impact, plan and review impact processes they are using, and consider the types of impact they are working towards, and the level of impact on beneficiaries.

Using AS-FAR as a structure to judge research impact

The interrelated components of the framework provide a structure to locate different types of impact and the researcher activities that contributed to them. Researchers could use AS-FAR in research reports to describe the research and the types of impact that are most relevant to specific audiences, for example describing the impact processes that enabled collaboration or involvement of stakeholders, research users or end-users.

Future iterations of REF could draw on AS-FAR as a guiding structure to capture information and to judge different components of research impact. Assessors may wish to focus on levels of impact or types of impact, or to judge impact in its different research contexts. This potentially opens up research reporting to transparency about which components of research impact are of interest to assessors and why. It could also enable greater debate about the relative importance of different types of impact and impact processes from the perspectives of stakeholders, researchers, research users and end-users.

Researchers could also use AS-FAR to make ongoing judgements about which impact processes are, or are not, contributing to research impact in a particular study or programme. This could enable researchers to examine and reason how they are investing their time and resources alongside traditional research processes. Breaking impact processes down may enable more accurate time management, accounting and justification of the economic use of resources for different activities. It could also help researchers to make judgements about what is required of others (eg, professional support services or external contractors) to contribute to research impact. At a research-team level, AS-FAR could enable research managers to understand research impact and to gain information to explain the propagation of impact over several years or by teams of researchers.

Using AS-FAR as tool for research practice development

As a theoretical tool, the framework serves as a basis for the connection of micro-level (researcher) and macro-level (higher education sector) practices, providing a meso-level or middle-range theoretical platform (HEIs/organisations) for hypothesis formation. At a micro-level, researchers could use the framework to critically reflect on decisions at different stages of the research, for example why certain decisions were taken about which stakeholders to involve (and who was not involved) or which types of impact processes were used (and who this may have favoured). At a macro-level, leaders in the higher education sector could use the framework to critically reflect on decisions that shape research impact. Middle-range hypotheses for bridging the micro- and macro-level could follow; for example, the hypothesis that research impact relies as much on the actions and achievements of academic support staff as it does on researchers could be explored, or the hypothesis that directing research funds towards particular impact processes will enhance research impact.

A further benefit of using AS-FAR as a tool for examining research practice is the potential to observe disciplinary effects. While the framework is developed in the context of LGM research, the underpinning research that contributes to this field is derived from multiple disciplines. It is likely that discipline will determine research processes, which different mechanisms and impact processes are appropriate and the types and levels of impact targeted or achieved. Discipline is also likely to be associated with different contextual factors that interrelate with research impact (such as funding streams or research priorities), as well as the multitude of measures that may be used to describe LGM impact.

AS-FAR may be useful to help define system boundaries for research impact (eg, the boundaries between research impact and research commissioning). This could help to define roles and responsibilities in relation to achieving greater research impact. It could also be used to consider how components of research impact interrelate with components of other systems, such as systems of community development, health promotion or economic progress, and so on. Looking at research impact as a system alongside other systems or focusing on one component of impact at a time could be useful for developing new, impact-orientated approaches and methods for LGM research.

6.2 Critical review of claims to impact

This section uses findings from the study to illustrate how claims to LGM research can be critically reviewed using AS-FAR (Figure 11). This critical review exercise aims to illustrate how researchers can use evidence more judiciously for the benefit of designing and producing strong accounts of research impact. It could also be used to inform future research assessment exercises, including REF.

This approach to critical review of impact is explicit in its recognition that different research designs and methods are more or less appropriate for answering different LGM research questions. The intention here is not to critique the underpinning research, but to critique the strength of claims to research impact. The term 'strength of claim' has a specific meaning in this context, reflecting the case study format (ie, narrative data) and the purpose of the critical review to inform researchers' design and production of accounts of impact.

As previously explained at the beginning of this chapter, strong claims are convincing because they show causality, use measures and indicators, address issues of attribution and contribution, emphasise progression or spread of impact, show systematic capture of impact information, and present a tailored account using an active authorship style. Critical review considers the construction of impact claims and the underpinning evidence for such claims.

This review sets out a common language that can be used in the discussion of the strength of claims to research impact. It makes use of AS-FAR to establish how far claims made for impact are supported by the evidence. The evidence is assessed here in relation to:

- research contextual factors
- impact processes
- types of impact
- levels of impact (beneficiaries).

The collective strength of this body of evidence is then critiqued according to the case studies that constitute it, and by the size, context and consistency of the body of evidence.

Evidence on research contextual factors

Providing information about research contextual factors helps to support claims to impact by showing the significance of the impact in its wider context. Claims to research impact appear to be stronger where case study authors have explained how the research made use of contextual leverage (factors in the wider research context) to stimulate research impact.

While case study authors have provided good information about collaborations/partnerships, they have not always clearly explained the socio-economic factors that enabled such collaborations to occur. While authors were required to cite the source of research funding, few described how the research linked to, or made use of, funding streams or resources to achieve impact. This information would help to establish the significance of the research within a larger body of funded work.

Most case studies explain the wider political/professional or public agendas that relate to the research. Fewer explain the how the research interacts with these agendas, for example providing details of influence on government policymaking or political figures or professional bodies' campaigns on issues. The result is that claims to research impact could be stronger if the importance of the collaboration or political interaction were explained more. Case studies in health and social care tend to be better at describing how the research aligns with public/user agendas, for example media attention or consumer groups, pressure from the market, or end-users of services for change, which adds weight to claims of research impact.

LGM research that involves public service organisations is more likely to explain how the research fits with existing wider strategies or plans for change, for example national policies or recommendations that require research users to take action. Case study authors in these fields are also more likely to estimate the scale of the potential benefit, explain the lack of availability of other

research outputs to meet a need, and to make use of indicated outcomes such as the estimated scale of potential beneficiaries. This is likely to be because groups of beneficiaries (eg, specific groups of health or social care service users) can be more easily identified in relation to research in these areas.

Evidence on impact processes

The case study data provides information about the processes of impact generation that researchers have employed. However, this information has to be drawn out from the case studies where it may be reported within sections on Underpinning Research or Details of Impact.

All case study authors provided information about researcher factors that contributed to research impact. This information includes researcher skills and abilities of the researchers, researcher characteristics (eg, expertise or experience) and actions taken (REF guidelines required authors to provide information about lead researchers). Many authors explained researcher interactions with stakeholders, for example having an influencing role in the decision-making of stakeholders through appointment to advisory or special interest groups; and with research users, for example through engagement or collaboration with research users to understand their needs. Information about researcher ability to collaborate, including interaction expertise, was more implicit, for example researchers' empathetic competence to adapt research methods to suit client groups or research contexts.

Evidence on research impact is more visible when researchers have planned and designed research for impact, for example using a research approach to focus on a specific end goal. However, this tends to be approached by case study authors as the justification or rationale for the research, rather than evidence to support claims to research impact. The result is that claims to an association between the research and the impact are not as strong as they could be if case studies described these interrelationships. Lack of information in the case studies about aims or plans for impact creates a false impression that no prior consideration was given to research impact.

Case study authors substantiated their claims to credibility by providing information about researcher expertise/roles, such as being highly regarded or a recognised expert in the field. Some case studies imply that effective researcher communication skills have contributed to research impact, for example invitations to speak publicly or the ability to explain technical or complex information to research users. Fewer case studies report on researcher skills to work with members of the public/users, research design skills, or skills in impact planning or participatory working, which helped to strengthen claims to research impact. Even fewer case studies provide information about researcher actions to implement research outputs or to record outcomes, which misses the link between research outputs and research impact.

Information about collaboration/partnerships, for example with industry partners, or interdisciplinary collaborations centred on multi-sector research issues, is fairly easy to identify in the case studies. There is less information about processes of stakeholder engagement, for example stakeholder identification, selection, recruitment and involvement of stakeholders in the application or co-production of knowledge.

Case study authors could make claims to impact far stronger by explaining how their interactions with research users facilitated LGM research impact, for example, how they went about encouraging research users to be open to collaboration, responsive to their stakeholders, or more aware of public/user views, such as understanding the market or outcomes that matter to end-users. If research users were involved in research design or integrating the research into plans to change, or were active participants in the research, these actions can support claims to impact as they indicate readiness for change. Similarly, information about whether researchers helped research users to communicate their needs or see a viable benefit of the research (in terms of understanding the challenges or problems faced, for example) can help to show the relevance of research outputs to research users. A further way of supporting claims to impact is to provide information about research users' role in implementation, but very few case study authors explained how this supported research impact.

Very few case studies describe processes of public/user involvement such as information-sharing, consultation or collaboration in the research. Such information could encourage good-quality public/user involvement compared with tokenistic or instrumental involvement practices[256]. It could also help to uncover 'the missing links'[257] between context, mechanisms and the impact of public/user involvement in research. There is still much to learn about the types of research impact specifically associated with public/user involvement in LGM research, and at different levels of impact (not only at the researcher level[258,259]). Themes in the case study data indicate that the contribution of public/user involvement includes:

- research that is more relevant and able to address public/user views;
- greater spread of impact of research through public/user groups and networks;
- improved public/user capacity for involvement in research;
- enhanced research practices and researcher skills to work with the public/users.

The case studies provide detailed information about the mechanisms through which impact has been achieved. Some mechanisms appear to be used more than others. Over two-thirds of the case studies describe mechanisms for stimulating interest in the research such as using influence, debate or discussion. Nearly a third of the case studies identify mechanisms for keying in to the interests of stakeholders, research users, researchers or end-users, for example through engagement (and civic engagement to a far lesser extent). Similar proportions of the case studies describe mechanisms for spreading knowledge, for example informing, demonstrating or knowledge-transfer; and for building knowledge, for example consultation, co-creation or shared decision-making.

Fewer case studies describe mechanisms for validating knowledge/impact, for example feedback, or creating spaces for exchange, for example through discourse, linking or connection; or perspective sharing, for example interaction or knowledge exchange. The case studies reveal little about mechanisms for spreading expertise, for example shared learning or secondments to spread skills, learning or development opportunities. Evidence on the effect of mechanisms for exchange is clearer when case study authors have given attention to issues of attribution and contribution.

Few authors supported their claims with evidence about how research outputs contributed to research impact, for example by explaining how the research outcomes are backed by stakeholders, or that research outputs are considered safe, economical or acceptable to the public/users. More authors describe the utility of research outputs to meet research users' needs, such as the use of evidence by professional bodies in guidance or principles. While case study authors may describe research outputs as being accessible to research users, they do not generally explain whether research outputs aligned with research users' plans for change. Nor do the case studies state whether research users feel outputs are credible and present a clear message in a language or format that is familiar to them. Case study authors could strengthen their claims by explaining whether research outputs were developed to enable research users to feel a sense of ownership over the research, or to generate detectable effects.

There is some evidence about framing or translating research outputs in terms of developing key messages for target audiences or translating research outputs into information resources, guidance or recommendations for different audiences. Less information is provided in the case studies about processes of implementing research outputs or assessment of outcomes. More information about setting impact objectives, monitoring, evaluation, use of outcome data, evaluation tools and resources, and reporting success could help to strengthen claims to research impact. Claims to impact are more convincing when case study authors have used techniques to capture research impact.

Evidence on types of impact

Within the 1,309 included LGM case studies, the level of detail provided about types of impact is generally good, given the limited space authors had in which to make their case. However, the narrative format and heterogeneity of terminology used mean that it is difficult to make useful comparisons about types of impact reported across the data. Claims to impact are stronger when case

256 Morrow, E., Ross, F., Grocott, P. & Bennett, J. (2010). A model and measure for quality service user involvement in health research. International Journal of Consumer Studies 34(5): 532–39.

257 Staley, K., Buckland, S., Hayes, H. & Tarpey, M. (2014). 'The missing links': understanding how context and mechanism influence the impact of public involvement in research. Health Expectations 17(6): 755–64.

258 Staley, K. (2009). Exploring Impact: Public involvement in NHS, public health and social care research. Eastleigh: INVOLVE.

259 Barber, R., Boote, J., Parry, G., Cooper, C., Yeeles, P. & Cook, S. (2012). Can the impact of public involvement on research be evaluated? A mixed methods study. Health Expectations 15: 229–41.

study authors have tailored their reporting and authorship style to emphasise different types of impact. The categorisation of types of impact developed here (types I to IV) offers a way of describing a range of types of impact in the future.

Within the case study sample, there is greater reporting on the use of evidence and research products (type I and type II impact) compared with reporting the effect of research on individuals and groups/organisations (type III and type IV impact). The case studies provide strong evidence for the collective influence of LGM research on law, government policy, strategy, regulation, standards, guidelines (recommendations for practice) and priorities (for research or practice) (type I impacts). The case studies also provide good evidence of the development and use of research products such as a training programme or course, intervention (programme or initiative), toolkit, model, decision aid, system (operational), support network, technology, measure, methods, arts, and so on. In contrast, there is a relative deficit in reporting of effects on individuals and effects on groups/organisations.

More focused reporting of type III impacts could provide insights into research impact on individuals' awareness, attitude, understanding (knowledge) and behaviour. Reporting of type IV impacts could provide important insights into research impact on knowledge-transfer (intra-organisation, inter-organisation or network), organisational development (innovation, new systems or structures), organisational performance and impact on end-users.

The included case studies use a multitude of measures (n=145) in different LGM research contexts to measure different research outcomes at various stages of development and use. These measures include:

- Measures of effect (eg, performance, productivity, effectiveness, learning, skills or knowledge, decision-making, behaviour, health or social impact)
- Measures of importance (eg, clinical or psychological assessment or diagnosis, inequalities, community needs)
- Measures of value (eg, individual attitude or attributes, experiences, perception, economic, safety, political, social, employee engagement, participation).

In the higher education context, measures have been developed to evaluate HEI performance and regional contribution, learner retention, attainment, transition from learning to work, measures of work and life satisfaction, student selection and assessment of competencies.

Evidence on levels of impact (beneficiaries)

All of the case studies identify beneficiaries, but the majority lack details about the types and numbers of people involved and their position and involvement in relation to the research. This makes it challenging to draw comparisons about impact on beneficiaries across the data. Claims to impact could be strengthened by using consistent descriptions of different groups of beneficiaries (stakeholders, researchers, research users, end-users). Few case studies sufficiently describe end-users, as distinct from research users. While case studies in the 2014 REF provide good evidence of impact at the level of research user (for example, well described and use of measures), few case studies provide a critical perspective of research use such as the reasons for uptake. There is much weaker evidence of impact beyond the research-user level. Evidence of impact at multiple levels is stronger when case study authors have emphasised progression or spread of impact.

There is relatively weak evidence about the impact of LGM research at the end-user level. It can be difficult to show direct causal links between LGM research and effect at the end-user level. Researchers may be reluctant to make claims about impact at the end-user level because of the challenges of selecting appropriate measures or achieving statistically significant outcomes. Yet it is just as important to know what types of impact on end-users the researchers had in mind, and to what extent the research is achieving or might achieve this impact.

With a shortage of information about impact at the end-user level, the claim to impact is often limited to a claim to research use rather than a claim to effect. The question remains, what was the effect of the use of evidence or research products? In higher education contexts, indicated types of impact on end-users include: student experience; student engagement; student retention; student learning or attainment; staff and student well-being; staff skills or knowledge; staff progression; staff commitment or employee engagement; and effects on communities or sectors of the public who might use or benefit from higher education.

However, because of the lack of detailed information about impact at the end-user level, it is not possible to make meaningful comparisons about the scale of impact on end-users.

Impact at the stakeholder level (eg, policymakers, commissioners, regulators or collaborators directly involved in the research) can provide important insights into how research is initiated and supported. Impact at this level is likely to link into the contextual factors that influence impact processes in the research, such as stakeholder engagement and political or professional backing.

There is little evidence in the case studies about the impact of research at the researcher level. There is some indication of impact on research collaborators and public/user researchers involved in undertaking the research, as well as the contribution of public/user involvement to the impact of LGM research. Evidence of impact at the researcher level could inform the development of researcher skills, research practice and organisational research capacity.

The overall body of evidence

There is a large body of REF case studies (1,309) relating to LGM research. The case studies are highly consistent in claiming significant positive effects of LGM research. The case study data is contextually relevant to the wider field of LGM research. The LGM case studies are sufficient in number to enable exploration of meaning and qualitative analysis. The body of evidence is diverse and credible, and the claim to research impact is convincing.

Typically, evidence of impact is located throughout the case study narrative rather than in specific sections (such as Details of Impact). There are limitations to the amount of information that case study authors could provide and some information about impact is more relevant to some case studies than others. This critical review helps to show which information is most important for building a strong claim to research impact, for future REF or other assessment purposes.

Chapter 7: Concluding reflections

7.1 Policy observations

Research funders can encourage HEIs to cooperate on the development of research impact as well as competing for research funds.

Interest in the impact of higher education research is growing, not only because impact is part of the REF and the funding mechanisms for higher education, but because it is a useful, multifaceted concept. Research funders can encourage HEIs to cooperate on research and development work to inform research policy and practice. Research impact allows researchers and HEIs to learn about the affect of their research on different areas of society and it means research can be judged for its importance, effect or value. Studies such as the one presented here, which attempt to analyse the relationship between research and impact, can help to illuminate what works in research impact. They can also help to drive forward an evidence base for research impact and highlight good practice across the higher education sector.

Contributions to LGM research in the UK higher education sector come from many HEIs, UK regions and disciplinary fields. A substantial proportion (86%, n=131 HEIs) of the 154 UK universities that submitted to the 2014 REF returned case studies considered to be within the field of LGM research (a sample of 1,309). Understanding the collective impact of LGM research as a cross-cutting field can help to raise the profile of LGM research. It also opens up opportunities for shared learning and development in LGM research between contributing groups and organisations. This report highlights some of the work of leading research groups and HEIs and enables researchers to see where their work contributes to the LGM field. Insights gained through this study can inform strategies to consolidate and build on these existing areas of outstanding research.

Research assessors and HEIs can retrospectively observe the effects of research and also seek to proactively cause research impact.

The study reveals the types of impact LGM research has, not only on leadership, governance and management practices. LGM research may also be used to inform changes in law, policy or guidance (type I). It may inform the development of research products (type II), such as training, interventions or models. It may affect individuals in more subtle ways by changing awareness, attitudes, understanding or behaviour (type III). It may affect groups or organisations by improving organisational development, performance or end-user outcomes (type IV). Identifying and enhancing the effects of LGM research at the individual, group or organisational level are difficult, but are perhaps more important than focusing on auditing the use of evidence or research products.

This study can offer little to current debates about the use of metrics to assess research impact. However, in general terms, these findings suggest that metrics for LGM research impact should take into consideration the different components of research impact, such as beneficiaries, types of impact and levels of impact. Metrics for research impact could also take into consideration efforts to maximise research impact through the development and use of impact processes (although in the case of REF this could overlap with assessment of research environment).

Guidance and support for HEIs and researchers could help to further develop pathways to research impact.

The REF case studies provide useful information about routes researchers have taken to achieve research impact which could be developed into pathways for researchers. Such guidance would help to demonstrate that research impact is not entirely driven by, or attributable to, the actions of researchers. It may also help researchers to see research impact from the perspective of stakeholders, research users and end-users. In particular, guidance on public/user involvement could address some of the inconsistencies and uncertainties between the underlying disciplinary fields of LGM research.

Research impact is changing research practice by extending the boundaries of research beyond HEIs into stakeholder and research-user organisations. To make the most of research impact, HEIs can look beyond their role as producers of research: HEIs and their staff and students are also beneficiaries of LGM research. In a similar way, researchers can view research impact as a system that they can make use of, and contribute to shaping, rather than simply a set of impact skills that they should acquire or a linear set of actions that they should follow.

The Adaptive System Framework for Advancing Research (AS-FAR) developed here can help to guide researchers to plan:

- Where to aim for research impact – by considering the main groups of beneficiaries and levels of impact
- When to look for impact – from the beginning of the research and at key points in time
- How to build links between the research and impact – by using impact processes
- Why this impact matters – by showing the significance of the impact in its context.

Research commissioners and assessors can encourage researchers to provide a more complete picture of research impact.
These case studies of research impact generally focus on outcomes for research users. However, this overlooks the fact that research impact can occur at multiple levels of impact: stakeholder, research user, researcher (including collaborators in the research), and end-user. A more complete picture of research impact would show different types of impact at these multiple levels. The learning from this study is that research impact can be broken down into different categories of impact type and levels of impact.

Researchers can, and do, make use of outcome measures to explain the significance of the impact of their research. However, measures are necessarily context specific and therefore heterogeneous. In a diverse field such as LGM research, it is not possible to define a standard set of outcome measures for the purposes of research assessment or otherwise. Even if it were possible to define such a list, this could unhelpfully limit LGM research and its actual impact. There is, however, some conceptual overlap in current use of measures in some areas of LGM research. For example, measures of performance, productivity, behaviour and engagement could be further developed as key suites of measures for LGM research. Psychological measures of happiness and well-being are also promising but more diverse in their meaning and use in different areas of LGM research. Measures of learning, experience and perception could also be useful for evidencing types of impact at the end-user level.

7.2 Possible ways to develop LGM research impact

The Leadership Foundation

Possible ways forward for the Leadership Foundation to support higher education-wide, strategic-level development in LGM research impact could be as follows.

- Support future regional and sector-wide collaborations for the delivery of LGM research impact learning and development opportunities through its membership engagement and knowledge-exchange activities.
- Undertake further work to assess and/or develop LGM research impact in relation to its own commissioned research, possibly drawing on AS-FAR to define priority areas and issues to focus on (Figure 11, Chapter 6).
- Explore ways that better understanding of research impact can inform understanding of 'what works' in LGM in the higher education sector.

HEIs

Possible ways forward for HEIs to support strategic capacity development in research impact (focusing on LGM research where appropriate) could be as follows.

- HEIs can demonstrate their commitment to research impact by stating why they believe it is important and what they will provide to support learning and development.
- HEIs could allocate resources and provide staff (academic and professional support service staff where appropriate) with basic training on the meaning of research impact, for example as part of staff induction or away days.
- HEIs can ensure that training and development for research impact are resourced, embedded and promoted as part of organisational and departmental research strategies.
- HEIs could strengthen senior leadership responsibility and accountability for the implementation and review of research impact strategies.

- HEIs can develop systems and structures to support research impact, including building shared mechanisms for exchange (eg, discussion, debate, knowledge-transfer) and impact processes (eg, collaboration/partnership, impact planning, public/user involvement) across research teams, departments and organisations.

Research education providers

As greater emphasis is placed on orientating research practices towards research impact, it is likely that researcher training and leadership development in this area will become more necessary. Knowledge and skills in research impact could be enhanced through existing researcher training schemes or as separate courses delivered across HEIs.

Possible ways forward for researcher training and development for LGM research impact could be as follows.

- Researcher training and development for LGM research impact could provide ongoing support in three key areas – administrative (eg, understanding the rationale and requirements for research impact), research (eg, practices associated with research impact) and personal support (eg, mentorship or support for skills development).
- Drawing on AS-FAR (Figure 11, Chapter 6), practical training could encourage researchers to see research impact as a system that they can make use of rather than as a set of skills or abilities that they should acquire.
- Training and development opportunities could be made accessible to all researchers whatever their level within an HEI, or at least training should not exclude those who are keen and interested in learning about research impact.
- The aims of researcher training and development could be orientated towards enhancing LGM research impact (not necessarily limited to future REF submissions).
- Training and development can build on existing researcher knowledge and abilities within HEIs about LGM research.

Researchers and research managers

Possible ways forward for researchers and research managers to enhance LGM research impact could be as follows.

- Researchers could make use of available research impact models and frameworks such as AS-FAR (Figure 11, Chapter 6) to plan for research impact as part of LGM research proposals.
- LGM research teams can allocate champions for impact so that research impact is considered, identified and reviewed throughout the life of a research project or programme.
- LGM research teams can regularly reflect on the mechanisms (Figure 9, Chapter 4) and impact processes (Figure 10, Chapter 4) they are using to achieve research impact.
- Collaborators/partners in LGM research (eg, stakeholders, research users or public/users) can be informed about research impact and their role in achieving impact.
- LGM researchers can aim to report on research impact as a standard part of their reporting to research funders or HEIs, including their route to impact.

The next section puts forward ideas for future research on LGM research impact.

7.3 Directions for future research on LGM research impact

The following list of ideas has emerged from the analysis and is included here as offering potential ways to extend understanding of LGM research impact.

- Research using quasi-experimental designs could examine the effectiveness of different pathways for LGM research impact.
- Consultation or consensus-building research with higher education researchers could facilitate knowledge building about impact processes, mechanisms and routes to impact.
- Action-orientated research with LGM researchers could enable the identification of professional development issues and targeted strategies for building capacity and researcher impact skills.

- Economic research could usefully explore factors associated with the costs and benefits of research impact to inform impact planning.
- Survey research with higher education leaders focusing on maximising the impact of LGM research on higher education could inform strategic change, productivity and quality improvement across the sector.
- Research to assess the extent to which individual case studies have actually used meaningful public/user involvement in the process of the research could inform future involvement strategies.
- Research with the public/users on mechanisms for exchange such as co-creation or shared decision-making would help to strengthen the evidence on public/user involvement in LGM research.
- Research with LGM case study authors could explore trends in spread and gain a more accurate picture of how to maximise the uptake and sustained impact of LGM research in different sectors.
- Research could explore the idea of beneficiary reviews such as online feedback systems for research users to leave comments or reviews, and the usefulness of such systems for spreading and assessing research impact.
- A scoping review could extend understanding of how to evidence research impact by looking at the use of measures in LGM research.

7.4 Closing comment

The REF impact case study database is a door to a world of higher education research that is often closed to those who are not part of that world. The database is a remarkable, if not the best, example of an open-access research resource. It is itself a powerful mechanism for generating research impact. This door must be kept open and used to inspire other entry points into UK higher education research. Entering the REF database is to become emerged in a fascinating world, like sitting down in a virtual library with a vast encyclopaedia of knowledge and expertise. Each account contributes to a volume of research that is bold in its aims and vibrant in its creativity.

The impact case studies are a testament to the endeavours of the UK academic research community, whether it is to inspire an audience, drive an action, inform a community, break the status quo, or change an opinion. The research reported is often humbling in its orientation towards the alleviation of human pain, suffering and inequality. Our understandings of research impact can help to find ways to extend these benefits. Leadership, governance and management research can offer insights into how best to go about planning and fostering the most productive research relationships.

Annexes

Annex 1: LGM case studies returned by HEIs

East	
University of Cambridge	27
University of Essex	14
Anglia Ruskin University	12
University of Bedfordshire	9
University of East Anglia	7
University of Hertfordshire	1
Cranfield University	1
East Midlands	
University of Nottingham	29
Loughborough University	14
University of Lincoln	13
University of Leicester	12
Nottingham Trent University	6
University of Derby	5
De Montfort University	5
University of Northampton	4
Bishop Grosseteste University	1
London	
University College London	19
London School of Economics and Political Science	17
City University London	16
King's College London	13
Middlesex University	13
Brunel University	12
Birkbeck, University of London	10
Institute of Education	9
University of East London	9
Royal Holloway, University of London	9

University of Westminster	8
Queen Mary, University of London	8
University of Roehampton	7
Imperial College London	6
SOAS, University of London	6
University of Greenwich	6
London Metropolitan University	5
London School of Hygiene and Tropical Medicine	4
University of West London	4
Goldsmiths, University of London	4
Kingston University	4
London Business School	3
London South Bank University	3
St Mary's University College	3
Royal Veterinary College	2
University of the Arts London	2
The Royal Central School of Speech and Drama, University of London	1
North East	
Durham University	26
Newcastle University	19
University of Northumbria at Newcastle	13
Teesside University	4
University of Sunderland	2
North West	
University of Manchester	32
University of Liverpool	22
Lancaster University	15
University of Salford	14
University of Chester	9
University of Central Lancashire	8
Manchester Metropolitan University	8

Liverpool John Moores University	4
University of Bolton	3
Liverpool Hope University	3
University of Liverpool and Liverpool School of Tropical Medicine	1
Northern Ireland	
Queen's University Belfast	19
University of Ulster	13
Scotland	
University of Edinburgh	38
University of Glasgow	29
University of Strathclyde	20
University of Aberdeen	14
University of St Andrews	9
Robert Gordon University	7
University of Dundee	7
University of Cumbria	6
University of Stirling	5
Queen Margaret University	3
University of the Highlands and Islands	2
University of the West of Scotland	2
University of Edinburgh and SRUC, Scotland's Rural College	2
Edinburgh Napier University	2
Heriot-Watt University	2
Glasgow Caledonian University	1
Glasgow School of Art	1
University of Abertay Dundee	1
EaStCHEM	1
PHYESTA (Edinburgh & St Andrews)	1
South East	
University of Oxford	41
University of Southampton	21

University of Portsmouth	13
University of Brighton	13
University of Surrey	13
Oxford Brookes University	13
The Open University	11
University of Sussex	10
University of Reading	9
University of Kent	8
Canterbury Christ Church University	6
University of Winchester	4
Buckinghamshire New University	3
Southampton Solent University	1
South West	
University of Bristol	25
University of Exeter	21
University of the West of England	14
Plymouth University	14
University of Bath	12
Bournemouth University	2
Bath Spa University	1
Wales	
Cardiff University	40
Swansea University	11
Bangor University	7
Aberystwyth University	6
University of South Wales	4
Bangor University and Cardiff Metropolitan University	2
Wales Institute for Research in Art & Design	2
University of Wales, Trinity Saint David	1
Cardiff Metropolitan University	1
Glyndwr University	1

West Midlands	
University of Birmingham	25
University of Warwick	19
Aston University	10
Staffordshire University	10
University of Wolverhampton	9
Coventry University	8
Keele University	8
Birmingham City University	7
Edge Hill University	6
University of Worcester	6
University of Warwick and Liverpool School of Tropical Medicine	1
Yorkshire and the Humber	
University of Sheffield	24
University of Leeds	23
University of Hull	17
University of York	13
Sheffield Hallam University	9
Leeds Metropolitan University	9
University of Bradford	5
York St John University	5
The University of Huddersfield	5
Leeds Trinity University	1

Notes;

Several HEIs used up to four different names (eg 'University of ...' or 'The University of ...' or abbreviations or in capital letters. For these HEIs, the count was combined under the main name used by the HEI.

Annex 2: Details of impact reported in the LGM case studies

This annex provides details of the types of impact reported in the LGM case study sample which were used to generate impact categories (Types I–IV). The information was derived through qualitative analysis of the case studies (using Summary of Impact).

International or national law

Examples from the case studies of the use of research evidence in international or national law include: UK law on government expenditure, EU law on control of disease and infection, EU constitutional reform, criminal law on liability for HIV/AIDS transmission and exposure, EU data protection regulation, EU law on children's rights, Greek law on government reform, UK Postal Services Bill, UK counter-terrorism, UK housing legislation, UK devolution, UK Freedom of Information Act, UK charity law, Danish law on academic freedom, and a National Water Framework Act in India.

Government policy

Many case studies cite a contribution to policy as evidence of research impact. Examples from the case studies include: global governance on international labour migration, global trade architecture, policy on geoengineering, international cultural heritage preservation policies, international land property rights, use of non-renewable resources, road safety, excise duty on small breweries, codes of conduct on standards in public life, cyber-crime, policy on wrongful convictions and imprisonment in the criminal justice system, non-medicinal drug use, philanthropic taxation, tribal people's land rights in Australasia and North America, monetary policy in Africa, policy on environmental flood insurance companies, common agricultural policy, internet governance policy, public bodies reform agenda, policy on private finance initiatives, local integrity framework for local government, introduction of the living wage in London, putting people first for self-directed support, policy on community relations in Northern Ireland, the Apprenticeship Bill, social and emotional aspects of learning (SEAL) programme, student funding arrangements in higher education, policy on teaching history in schools, domestic violence offender rehabilitation policy, policies on gun crime, policy on crime prevention through environmental design (CPTED), policy on sustainable fishing, language policies of the Netherlands and Flanders and the Dutch Language Union, Scottish public petitions policy, Scottish education assessment policy, policy on rewards and remuneration for senior medical professionals, international policy on community-based influenza vaccination, policy on configuration of cancer care services, child welfare policies, inclusion of indigenous knowledge in sustainable resource management, electoral practices, and pensions protection policy.

Strategy

The impact of research on strategy includes international, national, regional and local strategies. Examples from the case studies were: coalition strategies for economic advantage in developing countries, strategies for supporting countries in conflict, transitional justice (dealing with past abuses of human rights) in new democracies, international strategies on food safety, UK national programme on substance abuse deaths (np-SAD), refocusing counter-piracy measures on the enablers of crime, strategy for refugee integration, disaster-risk reduction strategies to improve community resilience in the poorest countries, policy approaches to support private investment and innovation in Africa, sustainable development strategy, adaption planning strategy for urban climate change, strategies for player performance and training in rugby, road policing strategy, minimising fire risks in public spaces, limiting workplace harm to employees, national dementia strategy for England and the prime minister's challenge on dementia, active ageing, strategies for improving child poverty and well-being (Sure Start), prevention of elephant poaching, active travel for the improved physical health of young people, child internet and telecommunications safety, UK e-infrastructure strategy and E-Infrastructure Leadership Council, national workforce skills, strategy for recruitment and retention of employees in adult social care, resilience management of extreme events, regional strategy for low-carbon emissions, regeneration of disadvantaged urban areas, and increasing regional productivity of small- and medium-sized enterprises.

Regulatory frameworks

Case studies reveal impact on regulatory frameworks in a wide range of commercial and public services and disciplinary areas. Examples from the case studies were: tax law, e-governance, inspection or performance management in public services, regulation of European air traffic control, discharge of pharmaceuticals into waterways, the governance of commercial genetic testing in the EU, European qualifications framework for vocational education and training, governance of the oceans for marine conservation, general practitioner accreditation, regulation of innovation and market competition in water supply services, the legal and ethical use of personal sensitive information in national data linkage systems across the UK, regulatory strategies for

the protection of domestic workers, regulation of media policies (Leveson Inquiry), nursing regulation of essential nursing skills for giving medication, regulation of the education and professional development of pharmacists, food labelling regulations, regulatory impact assessment policy in the Organisation for Economic Cooperation and Development (OECD) and World Bank, regulation and restructuring of the UK electricity market, human embryonic stem cell research, Foresight and Responsible Research and Innovation Laboratory (FRRIL), and regulation of shipping ports and waterways.

Standards

Impact on standards included those for the private, public and charity sectors. Case study examples include: the development of global standards for social performance assessment in microfinance, international standards for breast cancer treatment, governance of medical practitioner competence, standards for genetic counselling, standards for effective management of exertion intensity in the treatment of cardiovascular and neuromuscular diseases, standards for the training of translators, assessment standards in English language tests, environmental standards for UK and Ireland to assess and improve freshwater ecosystems in accordance with EU legislation, standards for culture and ethics of the press, industry standards for emergency planning and management, banking regulation and stability, transparency of boardroom pay, corporate carbon accounting practices, school accountability (eg, league tables), standards for archaeological excavation, environmentally friendly practices in furniture manufacturing, charity accounting, and responsible innovation in the development of new technologies such as nanotechnologies

Guidelines for practice

Impact on guidelines for practice was prevalent in the field of health, followed by policing and education. Examples from the case studies are: global guidelines for diagnosis and management of airway diseases, global guidelines on medicine prescribing, clinical guidelines for drug dosage in pregnancy, guidelines for pre-pregnancy care for women with diabetes, guidelines for diagnosis of diabetes in pregnancy, guidance on the management of post-natal depression, guidelines for care of extremely premature and/or sick neonates, prescribing practices for people with schizophrenia, guidelines for genotyping and secondary screening for people at risk of pancreatic cancer, guidelines for managing muscular skeletal pain using complementary therapies, guidelines on the use of statins for people with cardiovascular disease, clinical guidelines for the treatment of thyroid cancer, clinical guidelines on the management of arterial fibrillation, guidelines on the diagnosis of hypertension (high blood pressure), guidelines on telemedicine, cognitive behaviour therapy (CBT) for severe mental health conditions, advanced care planning in end-of-life care, opportunistic screening and interventions in general practice for hazardous alcohol consumption, an ethical framework for organ donation, guidance for the management of binocular coordination (squint or long-sightedness) in children, guidance on the prevention of falls in cognitively impaired patients, protection of patient dignity, prevention and reduction of health-care associated infections, human organ transplantation, reducing transmission of infectious agents in artificial insemination, guidelines for residential care homes, guidelines for preventing oral disease in the general population, non-invasive treatment for decayed baby teeth, preventative medicine in animal health, guidelines for academic induction of teacher educators, guidelines for sports coaches, guidance on coaching and mentoring, HR policy to support front-line managers more effectively in their role as people managers, guidelines for prevention of psychosocial risk in the workplace, guidelines for police officers for working with interpreters, guidelines on the use of legal interpreters in law courts, police guidance on stalking offences, safety management of administrative hazard zones around volcanoes, peacemaking and reconciliation in Bosnia, guidelines for education and practice in professional bodies, educational guidelines for teaching grammar and writing, practices for contract management and dispute resolution in the construction industry, and practice guidelines in film-making to involve businesses and social enterprises.

Systems

Research impact on systems generally related to operational systems. Examples from the case studies include: integration of international border control systems for people and goods, care pathways for service delivery to people who have suffered a stroke, online company tax reporting systems for mandatory annual reporting, confidential incident reporting and analysis system (CIRAS) for railway accidents, systems for bulk purchasing in the health service, sentencing information system for the Republic of Ireland, which enables judges, lawyers and the public to access information on sentencing patterns, collaborations between organisations and system redesign (eg local councils), and information system integration in public service modernisation.

Priorities for funding or commissioning

Relatively few of the included case studies report impact on priorities for funding or commissioning. Examples include: identification of areas of deprivation and need at the neighbourhood level, areas for investment in dental inequalities, gaps in basic research in remote care policy (telecare), and awarding of Marie Curie research fellowships.

Training programmes or courses

Case studies reporting on training programmes or courses were found in the armed forces, sports, business, the clergy, animal welfare, health and education. Examples include: special awareness and safety training for Royal Naval submarine recruits, anti-doping education for sportsmen and women, breathing training for athletes, managing innovation training programme for business managers, training and accreditation of tourist guides in Scotland, training for call-centre employees, web-based training on elder financial abuse, continuing education for serving clergy, animal welfare officer (AWO) training courses for ethical practices in the food industry, training for care-home inspectors, training in suicide prevention for health and social care professionals, lean methods in healthcare, a practical obstetric multi-professional training (PROMPT) package to improve clinical care of mothers and babies, expert patient programme in self-management of long-term health conditions, self-management training for people with multiple sclerosis, mindfulness-based cognitive therapy training for practitioners and the public, DESMOND training for diabetes management, educational programme for healthcare workers and teachers on the immune response and biology of parasitic worm infections in children, biotechnology young entrepreneurs scheme (YES), leadership training for teachers, leadership development for secondary schools, online school-teacher training on nutrition and breakfast clubs, sustainability training for job-seeking graduates, and training for the long-term unemployed including refugees.

Interventions

Impact on the development of interventions was predominantly reported in case studies relating to health and policing. Examples include: an intervention for treatment and prevention of childhood obesity, therapy interventions for speech and language difficulties, psychological interventions for people with schizophrenia, online intervention for exam anxiety in students, pre-trial witness interviewing (PTWI) by Crown prosecutors across England and Wales, intensive family interventions and the use of motivational interviewing in children's services for alcohol or drug problems, iMUSE therapy rooms for children with special needs including autism, community exercise schemes (CESs), web-based self-care interventions for bulimic disorders, enabling self-management and coping with arthritis pain through exercise (ESCAPE) intervention, and use of cognitive interviewing or self-administered interviews in police investigations.

Visual arts, music or fiction

Relatively few of the included case studies reported impact on visual arts, music or fictional writing. Examples include: challenging perceptions of cultural identity through dance performance, applied interactive theatre performance on mental health issues, and science fiction writing on religious identity.

Technologies

Impact on technologies within the case studies related to underpinning research on health, transport, sports coaches, building and education. Examples include: MALTHUS tool for NHS commissioners to justify purchases of new radiotherapy equipment, variable life-adjusted display (VLAD) graphical tool used to monitor clinical outcomes in cardiac surgery, robotic companions for patients, interactive rehabilitation systems for stroke patients, autonomous and intelligent systems programme (AISP) in designing management networks for transportation, the coach analysis intervention system (CAIS) for sports coaches to improve their practice, student response system used in academia and industry, 'live environments' for distributed learners and workers, building information management (BIM) for built asset management, and technology-assisted learning for visually impaired students,

Information resources

Impact on information resources mostly included the production of databases. Examples include: Transport Direct for UK public transport information, Costal Wiki (providing publicly accessible coastal information), online self-help materials for feeling and performing better, and open-access internet database of Greek and Roman drama.

Decision aids

Case studies reporting on decision aids generally related to informing specific areas of professional practice in business or public services. Examples include: the award of government microfinance to local economies, management of shipping containers, EUROMOD for the measurement of potential economic effects of policy changes and work incentives in the EU, algorithms for exploration risks in the petroleum industry, evidence-based policymaking tools for councils, adoption of drugs or health technologies, a typology of intervention options for government action on public service problems, intelligent pricing decision support system (IPDSS), GM-SAT assessment tool for stroke survivors, malnutrition universal screening tool (MUST) for hospitals and care homes, clinical decision support system for mental health practitioners, a decision support system for investment with London's inward investment agency, Think London, HDM-4 road investment appraisal, an adult developmental coordination disorder checklist (ADC) screening tool, and risk communication to the general public about breast implants or smoking.

Models

Many of the included case studies reporting on models related to economic modelling, forecasting or simulation. Examples include: resource allocation models for health funding that enables equitable access to healthcare, clinical outcome modelling, a capability development model for government departments, value-based pricing (VBP) scheme for all new pharmaceuticals, National Institute for Health and Care Excellence (NICE) model to assess the cost-effectiveness of healthcare interventions, reliability growth modelling framework for engineering firms, a model of player performance in professional football, a model of social accounting, performance audit model for evaluating the value for money of private finance initiatives and public–private partnerships, backtesting models to evaluate assets in banking, econometric models for financial resource distribution in healthcare, computational simulation model (SKIN) for policymakers to test proposed innovation policies, healthy urban planning, transforming rehabilitation model for the resettlement of offenders, a hub model for teacher education in Scotland, forecasting models for capital reserves in general insurance, forecasting future requirements for pharmacists, statistical assessment and forecasting processes in urgent medical services, and military manpower forecasting.

Methods for teaching or education

Examples of case studies reporting impact on methods for teaching or education include: young people's learning about sex and sexuality, teaching philosophy in secondary schools, work-based learning, school-based interventions on bullying, global partnerships and study visits for intercultural and transformative learning, pedagogy of community engagement in higher education through placement learning, helping engineers learn mathematics, methods of student assessment in higher education, digital video for inter-professional learning, new systems in Armed Services recruitment and training, teaching skills to improve the employability of accounting and finance graduates, rights-based participatory approaches to teaching and learning, students as partners approach in undergraduate teaching, relational and reflective supervision in social work practice, personal development planning (PDP), positive learning dispositions (PLD) in schools and colleges, self-organised learning environments, statistical methods to analyse complicated data (such as pupil performance measures when measured alongside school, classroom, context and community factors), classification of graduate occupations, methodologies for recruitment, and selection (eg short-listing methodology in postgraduate medical education).

Methods for research

Case studies reporting on impact on methods for research include: the definition and measurement of social exclusion and poverty, methods for synthesising research findings for policy use, a model for engaging users in the design and development of medical devices for chronic wounds, practice-as-research (PaR) in the creative sector, practitioner research and critical self-enquiry, 'portrait' method for researching senior leadership in education, social network analysis (SNA), co-design and co-development of integrated systems for sustainable living, 'living laboratories' in the construction industry, engineering methodology for management of slope stability in communities (MoSSaiC) to mitigate urban landslide risk in developing countries, methodologies for recording historical evidence in books and documents, service user and carer engagement in research conducted in secure settings, self-transformation methodology for organisational performance and viability, analytic methods for formulating predictions, and estimates (eg, small-area estimation for disease risk).

Methods for participation

Case studies reporting on methods for participation focus on social inclusion and community development. Examples include: partnership working with socially marginalised groups in museum services, inclusion of older people in the development of socially inclusive products and services, Writing Lives storytelling project for communities, a tool for companies to measure the key drivers of stakeholder behaviour, co-production in public services, participative theatre with young people in socio-economic deprived areas; interest organisations and groups' participation in governance and policymaking, Football4Peace in divided societies, use of social marketing techniques to engage stakeholders in sustainability initiatives, community-led planning (CLP) in community development, a web-based resource for good practice in civic participation, Centre for Children and Youth (CCY) involvement of children and young people in decision-making, outreach or public engagement events (eg, seminars on preservation of local historical sites, public Competency Groups on managing flood risk), and creative writing for school children.

Measures or scales

Case studies reporting on impact on measures or scales include: economic impact of tourism, patient quality of life measures, safe noise levels in buildings, animal lameness scoring as a farm-management tool and a nationwide network of trained 'mobility mentors', a measure of general population well-being to inform environmental policy, a measure of cultural economy, patient-reported outcome measures (PROMs), global entrepreneurship and development index (GEDI), SF-6D calculation of quality-adjusted life years, assessment of work-related quality of life, carbon emission measures, and 'dialogic evaluation' for performance audits on public–private partnerships.

Benchmarks

A few case studies report on impact on benchmarks for quality or organisational performance. Examples include: quality assessment benchmarks for monitoring cardiovascular health in populations, web-enabled pattern analysis system to enable clinicians and their teams to view in-house mortality patterns in the national context, a benchmarking tool for university engagement in rural development, and a benchmark for rural economic performance.

Toolkits or tools

Toolkits or tools reported by the case studies were mainly used for administrative or educational purposes. Examples include: legal tools for the efficient and effective administration of international criminal justice, tools for advance practice nurses to show the impact of their roles, tools for Russian businesses to evaluate risk of corruption, a toolkit of resources for social work educators and diverse students to use to enhance the quality of the learning experience, a practical toolkit on gender equality in online media used in schools and universities, forgiveness toolbox for dealing with the consequences of violence and conflict, self-help cognitive behavioural therapy for people with depression or anxiety, a medicines management toolkit for children's hospices, and a toolkit of support materials for developing the talents of inner-city teenagers.

Support networks

Case studies reporting on impact on support networks, and support for companies, small businesses and members of marginalised groups included examples of: improving the commercial agenda and growth of small-scale theatre companies, Refugees Into Teaching in Scotland (RITeS), peer mentoring in teacher training, peer networks for leaders of small businesses, trainee primary school teacher support, and a community interest company for African asylum seekers, refugees and migrants.

Awareness

Case studies reporting on changes in awareness include: policymakers' awareness of tobacco industry influence on policy processes, policymakers' awareness of the personalisation agenda in social care, and professionals' awareness of foreign language pedagogy.

Attitudes

Case studies reporting on changes in attitudes include: policymakers' (UK and international) attitudes towards human rights, military ethics, crime prevention, anti-smoking campaign, attitudes towards climate-induced migration, attitudes towards economic policy, attitudes to the provision of early years education, attitudes towards non-physician support for maternal health and mortality in developing countries, attitudes towards immigration and social inclusion, attitudes towards low-cost public schools, attitudes towards the use of renewable energy, attitudes towards town-centre renewal and street markets as spaces

of diversity, professionals' attitudes towards workforce diversity in the legal profession, attitudes towards sustainability in the fashion and textile industry including recycling and upcycling, attitudes towards participatory practice in heritage conservation (the people-based conservation project), professional athletes' attitudes towards stress in competitive sports, managers' attitudes towards workplace diversity, attitudes towards gender and sexuality in the workplace, attitudes towards people with intellectual or developmental disabilities in the workforce and workplace, company employee attitudes towards professional or corporate responsibility, financial investment managers' attitudes towards risk and return, young peoples' attitudes towards bullying and body image, public attitudes towards same-sex marriage, public use of natural spaces for exercise, public attitudes towards audience and performance, attitudes towards physical and mental difference, attitudes towards stem-cell research, and attitudes towards racism and homophobia in football.

Understanding (knowledge)

Case studies reporting on changes in understanding include: policymakers' understanding of international issues (eg, Africa, Iraq, Cuba, Vietnam, China, Lebanon and Syria), understanding of tax avoidance, understanding of the relationship between Islamic law and international human rights law, understanding of UK public sector equality duty, understandings of 'big society' and behaviour change to reshape public service delivery, understandings about the place of universities in society and contribution to community development, understandings of non-territorial cultural autonomy (NTCA) in peacemaking between majority and minority groups, understandings of European citizenship, understanding of credit unions, understanding of the politics of fatherhood and maternity, professionals' understandings of physician-assisted suicide, understanding of socially excluded communities, public relations practitioners' understanding of subjectivity in everyday practice, practitioners in education and the criminal justice system's understanding of gang conflict, professionals' understanding of the 'glass cliff' for women in leadership positions, young peoples' understanding of future memory about human mobility, otherness and identity, young peoples' improved intercultural understanding, public understanding of the ethics of genetic selection and human enhancement, understanding of free will and consciousness, and public understanding of military healthcare in recovery from war trauma.

Behaviour

Case studies reporting on behaviour change include: policymakers' pro-environmental policymaking, democratic engagement in policymaking, health professionals' behaviour to recruit children to medical trials, healthcare workers' infection control behaviours, recognition of adolescent neglect in children's services, employee relations in aviation staff, young people's road safety behaviours, more active public involvement in democratic processes, household behavioural changes in energy consumption, hospital patient and visitor infection control behaviours, and widening public participation in golf.

Knowledge-transfer

Impact on knowledge-transfer included knowledge sharing and knowledge mobilisation within organisations, between organisations or across networks. Examples from the case studies include: international partnerships in the management of major sporting events, interdisciplinary collaborations between the humanities and construction industry, regional development agencies (RDAs) across Europe, global engineering networks, 'Pacific Connections' knowledge exchange for national and international policy contexts that confront misunderstandings between Euro-American and Pacific knowledge, 'innovation brokers', technical advisers and industry architects, knowledge-intensive business services (KIBS) for innovation in business, Professional Associations Research Network (PARN) for professional bodies, Change Management Consortium (CMC) for knowledge and practice on staff engagement in the strategic implementation of change, knowledge-brokers to improve knowledge on gender equality, creative clusters in the cultural and creative industries, collaboration for leadership in applied health research and care (CLAHRC) knowledge mobilisation for vascular-related conditions, the management of innovation within creative organisations, international collaborative choreography and dance-making, and more accurate BBC coverage of UK policy news.

Organisational development

Impact on organisational development included the quality of organisational practices and the development or redesign of organisations. Examples from the case studies include: institutional legitimacy of public service organisations such as the police and courts, House of Commons Backbench Business Committee (HCBBC), strategic human resource management in multinational enterprises, soft systems thinking in strategic organisational change, brand development and product and market diversification strategies, employee engagement in human resource practice, development of a usability culture in academic and industrial sectors, business support strategies for using shared service centres, service redesign in emergency ambulance

services, corporate responsibility for young people's alcohol consumption in the drinks industry, anti-corruption programmes in aid agencies, organisational development of navies and sea power, health promotion and intervention practices of sexual health charities, the development of new services (eg, for public health or victims of crime), early supported discharge services for stroke survivors, the development of effective forms of psychological support and interventions for people with facial disfigurement, and recovery colleges and peer support workers in mental health services.

Organisational performance

Impact on organisational performance reflected the broad range of topics in the underpinning research on business, education, tourism, retail and aviation. Examples from the case studies include: secondary school performance, reduced packaging waste and cost in the food industry, improved profits and audience interaction in the music industry, improved savings in complex supply chain networks in the manufacturing sector, economic savings in alternative dispute resolution in the judicial system, improved profits in the automotive industry, improved footfall in museums and visitor centres, cooperative management practice, improved health and safety, improved time management and collaboration, improved practices in food safety of food retail, expansion of routes in the aviation industry, and better bargaining power of trade unions.

End-users

Impact on end-users was also reported and case studies included: in education, student experience, student engagement, student retention, student learning or attainment, staff and student well-being, staff skills or knowledge, staff commitment or employee engagement, health outcomes (eg, older people keeping well and warm in winter), sense of belonging in marginalised groups, self-advocacy and influence of post-trafficked women in Nepal, consumer satisfaction with products, improved visitor experience in the tourist industry, reductions in new-born death and disability through cooling therapy, better treatment choices and health outcomes for children with asthma, crime reduction, improved access to medical education and outcomes for ethnic minority medical students and doctors, representation of women in union leadership roles, improved work-related well-being, creation of new jobs or opportunities for employees, restorative practice (RP) for improved life-goals and outcomes for young people and mental toughness, and improvements in employee well-being.

Annex 3: Measures used in LGM case studies

Keyword searches of the included REF case studies (searching across all data categories) were undertaken using the term 'measure'. Each occurrence of the term was read in context to identify the following list of measures used in LGM research.

Measure	Context	Stage of development/use
Education (HE, vocational training, secondary, primary)		
HEI performance	Contribution of HEIs to regional economies and societies	Benchmarking to evaluate HEI regional contribution (Newcastle University)
Measure of confidence in core academic function	HE staff practice	Development of a measure in the Lecturer Self-Efficacy Project (Bishop Grosseteste University)
Measures of learner retention in the education system, educational attainment, successful transition from learning to work and measures of work and life satisfaction	International career guidance policy	Use of a range of measures to assess and develop career guidance (University of Derby)
Measures of student competence in medication dosage	Safety of medication dosage	Development of a competency framework for learning and assessment about medication dose (University of South Wales)
Measures of medical candidates (knowledge, skills, abilities, non-cognitive attributes)	Medical student selection	Development and validation in candidate assessment and selection (City University London)
Measures of attentional bias	Exam-related anxiety	Used to examine test anxiety and performance (Edge Hill University)
Measure of English language test validity	English language tests	Development of a Socio-Cognitive Framework (SCF) for language tests (University of Bedfordshire)
Measures of system performance in vocational education and training	Technical and vocational education and training for development	Identification of indicators to measure system performance (University of Nottingham)
Measure of participation in continuing professional development (CPD)	Professional associations	Development and use to inform policies for governance and CPD (University of Bristol)
Measures of cost over time in educational markets	Low-cost private schools in developing countries	School performance outcomes and household surveys of parental costs of education (Newcastle University)
Value-added measures of pupil performance	School resource management, evaluation and accounting	Developed and used to inform programme evaluation (University of York)
Measure of children's language proficiency	Promoting foreign languages in primary school	Developed and used to test foreign language teaching methods (University of Southampton)
Secondary school student performance indicators	Secondary school education	Used to examine student performance against school performance (Institute of Education)
Measure of student achievement in core curriculum areas	Students with disabilities	Use of measures to inform provision of curricula, assessment and reporting (University of Northampton)
Language and literacy measures	Widening opportunities for socially disadvantaged children	Use of existing measures to evaluate intervention programmes (University of Sheffield)

Measure	Context	Stage of development/use
Value-added measures of school performance (including measures of student academic and attitude outcomes)	Evaluating school performance	Development and application to schools in UK and internationally (University of Bristol)
Government		
Critical thinking and communication skills	Political candidate performance	Use of pre-existing measures (City University London)
Performance measures for local government	Size and performance of local government services	Development and use of measures to assess performance (Cardiff University)
Measuring implementation of children's rights	Children's rights in EU policy	Development of rights-based indicators (University of Liverpool)
Measures of human rights	Human rights performance	Developed and used to rank countries (University of Essex)
Indicators to measure rights	Disability equality	Development of indicators that have been applied to law and policy (University of Leeds)
Business/organisations		
Organisational performance measures	Operations management practice	Testing application to systems model (Aston University)
Employee engagement	Human Resources (HR) practices	Critique of existing engagement measures which do not include emotional engagement and transactional engagement (Kingston University)
Commitment to change	Intense organisational transformation	Measures developed and used to evaluate engagement in organisational change (University of Bath)
Workplace productivity	Employee ownership plans	Used to evaluate share ownership (University of York)
Measure of workplace bullying	Workplace bullying	Development and application of a scale to show prevalence of bullying in multiple fields of practice (Birkbeck, University of London)
Career competencies indicator	Career management and development policy and practice	Development and validation in relation to objective and subjective career successes (University of Worcester)
Measure of executive career (total years spent by a director on the company's board)	Career Shares as a way to remunerate company directors	Measure used to assess pay versus performance (The University of Edinburgh)
Temporal intelligence	Time management behaviour in organisations	Development of a time-related measure and application to organisational leaders (University of Worcester)
WRQoL (psychometric measure of quality of working life)	Employee well-being	Validation and benchmarking of WRQoL scale, adaption to international audiences (University of Portsmouth)
Performance measures	Assessment of science and technology units	Development and application of a data envelopment model of key performance indicators (University of Kent)
Integrated performance measurement systems reference model	Manufacturing enterprises	Development and use of real-time business process performance measures to improve productivity and growth (University of Strathclyde)

Measure	Context	Stage of development/use
Measure of the virtual age of assets	Risk management of physical assets	Development and application of measure to improve performance of assets (The University of Edinburgh)
Measures of innovation	Government advice to firms on product and process innovation	Development of theory of innovation and underlying latent variables (Birkbeck, University of London)
Measures of research group performance	Evaluation of critical mass in research groups	Development and use to show association between research quality produced by a group and the number of members (Coventry University)
Global entrepreneurship and development index (GEDI)	Entrepreneurship policy	Development and validation of GEDI internationally (Imperial College London)
Statistical process control (SPC)	Safety and fault-tracking in National Grid gas	Development and use of measures to improve safety and efficiency (Newcastle University)
Third-sector/charities/social enterprise		
Measures of social impact	Social impact of enterprises and charities	Development and validation of social impact measures with enterprises and charities (Middlesex University)
Measure of social impact	Social impact of Social Enterprises (SE)	Development and use of social impact measures to assess SEs (University of Northampton)
Measures of social accounting	Social benefit of third sector organisations	Development and testing of measures in different organisational contexts (Newcastle University)
Health/ healthcare/social care		
Sense of coherence	Mental health services	Use of an existing measure to detect change amongst service users (Middlesex University)
Physiological measures	Seafarer fatigue as a health and safety issue	Use of existing physiological measures of fatigue (Cardiff University)
FertiQoL (fertility quality of life)	Tools to address infertility	Development and validation of the measure (Cardiff University)
Psychological measures of functioning	Psycho-education for bipolar disorder	Use of existing measures to evaluate an intervention (Cardiff University)
Patient-reported quality of life	Quality of life in people with wounds of the lower limbs	Development of a condition-specific measure and adaption for international audiences (Cardiff University)
Measures of experiences and quality of life in people living with dementia and other mental health problems	Enriched opportunities programme (EOP) in extra care housing schemes	Use of measures to evaluate programme effectiveness (University of Worcester)
Clinical outcome measures for multiple sclerosis (MS)	Developing treatment for MS	Critique of existing measures and development of a new scale (Plymouth University)
Symptometrics (measure of menstrual cycle symptoms)	Disorders of the menstrual cycle	Development and widespread take up of a measure (Keele University)
Central aortic pressure measurement	Assessment of hypertension	Developed and used to test effectiveness of blood pressure reducing drugs (University of Leicester)

Measure	Context	Stage of development/use
Malnutrition universal screening tool (MUST)	Detecting and managing malnutrition	Developed and used to identify and manage patients with or at risk of malnutrition in UK and internationally (University of Southampton)
Clinical measures (foot posture index)	Musculoskeletal services	Development of a series of clinical measures (University of Leeds)
Measures of psychomotor skill	Surgical skills	Development and use of measures in training and assessment (Imperial College London)
Measure of airborne allergens	Prevention of occupational asthma	Developed and validated measures used to evaluate level of exposure in a range of work settings (Imperial College London)
Antipsychotic non-neurological side-effect rating scale (ANNSERS)	Treatment of schizophrenia	Developed and validated a comprehensive measure for rating non-neurological, adverse drug reactions (Imperial College London)
Measures of physical activity, diet, mental health and social cohesion	Interventions to promote determinants of health and well-being	Suite of measures developed and used to evaluate Well London interventions at a population level (University of East London)
Measures of depression, self-concept and knowledge of nutrition, weight and shape	Self-care interventions for bulimia	Used to evaluate a self-care intervention (King's College London)
Measure of complex wound care based on patient-recorded outcome measures (TELER)	Wound healing and management	Development, validation and use of TELER in clinical and industry contexts internationally (King's College London)
Patient-reported outcome measures (PROMs)	Patients' health and health-related quality of life	Development and use of PROMs to evaluate elective operations (London School of Hygiene and Tropical Medicine)
Measures of cognitive and physical functioning	Interaction technologies for stroke	Use of existing measures to evaluate technology interventions (Nottingham Trent University)
Heart-rate variability	Trader and investor decision-making in financial markets	Use of physiological measure to examine emotional regulation (The Open University)
Patient-reported outcome measures (PROMs)	Assessing patient-reported outcomes in chronic medical conditions	Development of a series of PROMs and translation into over 100 languages (Royal Holloway, University of London)
Ambulatory blood pressure measurement (ABPM)	Diagnosis of hypertension	Comparison of diagnosis techniques including cost-effectiveness (University of Birmingham)
Care Quality Commission (CQC) inspection data	HR practice and quality of care delivery	Use of CQC measures to improve HR policies in adult social care (Manchester Metropolitan University)
Patient-centred outcome measure	Healthcare policy and practice for cleft lip/palate	Development of a measure and adoption by clinical teams in US and UK (University of the West of England, Bristol)
Borg's rating measure of perceived exertion and pain	Preventive and rehabilitative physical activity for cardiovascular and neuromuscular diseases	Testing and development of a scale to manage exercise intensity (University of Chester)
Measures of the effectiveness of arts in health	Arts in health and social contexts	Use of distance travelled to map the impact of arts participation on mental health service users (York St John University)
Measures of health inequality	Socioeconomic inequalities in health	Development and use to show inequalities across countries and over time (University of York)

Measure	Context	Stage of development/use
Student nurse stress index (SNSI)	Healthcare staff well-being	Development and application of SNSI to improve care delivery (University of Dundee)
A measure of eye convergence and accommodation	Binocular vision in young children	Development of measure and technique (University of Reading)
Process and outcome measures of prehospital care	Prehospital care provided by ambulance services	Development and testing of bundles of indicators (University of Lincoln)
Daily exhaled nitric oxide (FeNO suppression test)	Asthma in adults	Use of measure to assess and management of difficult-to-treat asthma in adults (Queen's University Belfast)
Measures of consumer decision-making and comprehension	Healthier food purchasing choices	Used to inform policies on nutrition labelling (University of Surrey)
Comparative hospital mortality	Hospital care quality	Development of measures and a user-interface for hospital mortality nationally (University of Surrey)
Measure of employee and manager social connections	Recruitment of health workers in developing countries	Used to examine behaviour and social organisation in the workplace (London School of Economics and Political Science)
Measures of physical function (balance, gait and coordinated movement) and psychological variables (attitude towards exercise)	Community exercise schemes for rural populations	Use of measures to evaluate exercise schemes (Aberystwyth University)
Cross-cultural instrument for assessing quality of life after brain injury (QOLIBRI)	Rehabilitation services for traumatic brain injury	Developed and use of measure to evaluate a community-based multidisciplinary neurorehabilitation service (Goldsmiths, University of London)
Measures of acute coronary care	Global monitoring of cardiovascular disease	Developed and applied to pathways of care and mortality in different countries (Queen's University Belfast)
Measures of mental health difficulties	Young person's teams for mental health	Measures developed and used to evaluate the effectiveness of the direct working component of a Young Person's Team (University of Northampton)
Measures of mood, emotion and emotional intelligence	Self-help material for feeling and performing better	Developed valid and reliable measures to enable testing of theory in different areas (University of Wolverhampton)
Measures of efficiency of self-help for medically unexplained symptoms	Self-help for medically unexplained symptoms such as chronic fatigue syndrome	Use of measures of efficiency and cost to evaluate self-help interventions (University of Edinburgh)
Stroke aphasic depression questionnaire (SADQ) and the Nottingham sensory assessment test to measure somato-sensory impairment after stroke	Stroke rehabilitation	Development and validation of SADQ internationally as a measure for assessing mood in stroke patients with communications difficulties (University of Nottingham)
Measurement of health programme impact	Community interventions to promote physical activity	Conceptual work on measurement of change while evaluating programme impact (Leeds Metropolitan University)
Quality of life indicators	Care quality improvement in care homes	Used to inform care home policy and practice (City University London)

Measure	Context	Stage of development/use
EQ-5D patients' self-reported health	Health service decision-making	Development and validation internationally, used to improve health and healthcare decision-making (City University London)
Measures of alcohol-related thinking and drinking behaviour	Health promotion campaigns	Used to test effects of alcohol responsibility campaign (London South Bank University)
Clinical measures of visual field	Visual field assessment	Development of a system to measure visual field and application to a wide range of children and adult patient groups (University of Edinburgh)
Measures of motor function in people with Parkinson's disease	Biomechanics of ageing and Parkinsonism	Development and use of measures to evaluate the effects of dance on the motor functions of Parkinson's patients (University of Roehampton)
Measures of doctors' continuing competence	Medical governance	Review of international systems of regulation and formulation of recommendations for policy (University of Lincoln)
Measures of regulation and performance	Management of change in the healthcare sector	Used to evaluate organisations and to inform organisational change (University of Aberdeen)
Measure of awareness for people with moderate to severe dementia	Dementia care	Development and use in staff training (University of Bradford)
Measure of cleanliness, privacy and dignity, length of hospital stays and appointment waiting times	Health- and social care practice	Used to inform practice development framework and accreditation (Bournemouth University)
Measures of health service outputs and productivity (including health outcomes, patient satisfaction, waiting times and readmissions, NHS labour and capital)	Health service productivity	Developed and used to assess national and NHS productivity and consultant productivity (University of York)
European practice assessment accreditation scheme	General practice care quality	Development and dissemination of measures of organisational quality in general practice (The University of Manchester)
SF-6D measure of cost-effectiveness of healthcare interventions	Costs of healthcare interventions	Development and international validation of the measure (University of Sheffield)
Children/early years		
Composite index of anthropometric failure (CIAF)	Child poverty and deprivation	Development and validation of a measure of child undernutrition (University of Bristol)
Measures of programme variability	National evaluation of early childhood support programmes	Development of measures to identify key dimensions of programme proficiency (University of Leeds)
Cognitive measures and social behaviours	Breakfast consumption and breakfast clubs	Development of cognitive measures including memory and attention (University of Northumbria at Newcastle)
Measures of children's socio-emotional health	Children's socio-emotional well-being	Development and use to evaluate a short-term school-based intervention (University of West London)
Measures of attention and cognitive performance in children's road-crossing decisions	Child and adolescent road safety	Development of measures to understand children's behaviours and to develop policy (University of Lincoln)

Measure	Context	Stage of development/use
Measure of the level and pattern of children's physical activity	Active travel to school	Time-patterning of accelerometer data to examine physical activity (University of Bristol)
Measures of deprivation-based child poverty and subjective well-being	Child well-being	Developed and adopted in UK and internationally (University of York)
Measures of overweight or obese children	Child health	Used to assess child health nationally (Institute of Education)
National child measurement programme (NCMP)	Child health	Developed and used to assess child health nationally (Institute of Education)
Measure of children's online opportunities and risks	Literacy and safety initiatives for children online	Development and use of a measure and benchmarking (London School of Economics and Political Science)
Psychometric measures for parental engagement	Evaluation of a parenting programme	Use of existing measures (Middlesex University)
Social/societal/crime		
Economic measures of happiness and well-being	Happiness and well-being in modern governance	Development and validation of measures based on personal characteristics (eg age, absolute income, relative income), macroeconomic variables (eg inflation and unemployment), and observable measures of quality of life (University of Warwick)
Measures of consistency and discrimination in decision-making	Detection and prevention of elder financial abuse	Development and use of measures to identify expertise in decision making (Brunel University)
Measures to assess change and stability in the social, moral and political fabric of Europe	European social survey	Development and use of a suite of measures in 36 countries (City University London)
Measures of horizontal social inequalities	Development policy in fragile states	Development and use of horizontal measures to understand reasons for conflict (University of Oxford)
Bristol social exclusion matrix (B-SEM)	Social exclusion	Development and application to examine poverty and social exclusion in the UK (University of Bristol)
Measure of persistent poverty	Income poverty	Development and use of measure in UK child poverty Act (University of Essex)
Measures of need for social housing	Equitable and cost-effective investment in affordable housing	Development and application of measures of need using secondary data sources (The University of Edinburgh & Heriot-Watt University)
Index of multiple deprivation (IMD) and health poverty index (HPI)	Identification of small areas of need within countries	Development of measures and application to countries internationally to detect small areas of need (University of St Andrews)
Measures of quality of life	Citizens' well-being	Criteria for the fair allocation of resources (London School of Economics and Political Science)
Measures of violent crime – hospital admissions and violence recorded by the police	Service model of data-sharing and violence prevention interventions	Use of existing measures to evaluate model implementation (Cardiff University)
Measures of positive change in prevention of gender-based violence	Gender violence	Stakeholder debates and identification of indicators of positive change (University of Glasgow)

Measure	Context	Stage of development/use
Conflict-related deaths	Transitional justice practice	Development of a package of measures (University of Ulster)
Sport/leisure/tourism		
Player quality index (PQI)	Coach and manager practices in elite team sports	Development and use of PQI to evaluate efficiency of managers (University of Leeds)
Measures of total and relative distances, number of collisions, heart rate and perceived exertion	Rugby player performance	Development of a suite of measures on player performance to inform training loads and match strategy (University of Chester)
Measure of moment-to-moment cognitive processes in sports coaching	Sports coaching	Development of procedural/conditional measure is informing coach education and development (University of Abertay Dundee)
Measures of neuromuscular, biochemical and perceptual responses	Managing fatigue and recovery in team sports	Use of established measures to assess player fatigue (University of Chester)
Performance measurement in professional football	Professional football player performance	Development of Player Performance Index for professional football (University of Salford)
A holistic measure of subjective well-being (SWB)	Social tourism policy and practice	Development of a measure of SWB incorporating validated scales of well-being (University of Nottingham)
Transport/shipping		
Measures of community safety	Accessible transport for sustainable urban environments	Use of measures as part of transportation in urban design planning (London Metropolitan University)
Multiple criteria analysis for highway design (HDM-4)	Road systems management	Measures developed for road investment appraisal (University of Birmingham)
Measures of cycling	Transport planning	Development and use in standards and practices for built environments (University of Bolton)
Measures of transport use and carbon emissions	Transport policies and planning	Used to inform Smarter Choices and travel behaviours (University of Aberdeen)
Measures of time for passengers to exit ships	Fire safety evacuation	Use of time as a primary safety parameter (University of Greenwich)
Measures of watch-keeping performance, reaction time and levels of alertness	Seafarer fatigue	Use of measures in simulation experiments (Southampton Solent University)
Environment/community planning		
Measures of sound	Standards for building acoustics	Development and use of measures to assess sound insulation and environmental noise (University of Liverpool)
Measures of temperature	Health impact of temperature (UK cold weather policy)	Use of subjective views of heat and cold together with objective measures (Sheffield Hallam University)
Measures of competitiveness between regions, cities and localities	Regional competitiveness and development	Development of a composite measure of the competitiveness of UK regions, cities and localities (Cardiff University)
Warwick–Edinburgh mental wellbeing scale (WEMWBS) and short form health survey	Policy processes for neighbourhood and community improvement	Community-level study using WEMWBS and SFHS together with other outcome measures eg area deprivation and community demographics (University of Glasgow)

Measure	Context	Stage of development/use
Measures of older people's reactions to urban design quality and walkability	Spatial planning policies	Development and use of measures to evaluate older people's experiences of unfamiliar urban environments (Anglia Ruskin University)
Measure of customers' perceptions of town centres	Town-centre policy	Development and use of consumer-focused measures to inform town centre policy (Loughborough University)
Measures of the operation and characteristics of community-led planning (CLP)	Community-led planning	Development and use of measure to evaluate CLP (University of Reading)
Measurement of climate change vulnerability	Human well-being and environmental policy	Development and use of multi-dimensional measures to inform policy (The University of Manchester)
Economic measures of adaption to climate change	Planning for adaption to climate change	Framework for projecting and analysing costs of adaption in the water, energy and infrastructure sectors (The University of Edinburgh)
Banking/finance/accounting		
Measures of market power	Market power and efficiency in banking	Design and dissemination of a measure of market power linked to risk and efficiency (Bangor University)
Financial measures to assess economic and social outcomes	Financial analysis of public–private partnerships	Development and use of measures to evaluate PPPs in health services and transport contexts (University of Manchester)
Financial performance measures	Sustainable credit unions	Measures used to inform organisational development of small and large credit unions (University of St Andrews)
Cost/value measure	Construction supply chains	Development and use within a contract management system (University of the West of England, Bristol)
Value for money (VFM)	Private finance initiatives (PFIs)	Used to inform government policy and accounting (University of Aberdeen)

Biography

Dr Elizabeth M Morrow

The author, Dr Elizabeth M Morrow, is an independent researcher previously employed within academic health services research at King's College London. This report builds on her work on public and user involvement in health research, the innovation and improvement of health services (The Productive Ward), and research on leadership and partnership processes within health service organisations.

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