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IMPACT AND THE RESEARCH ENVIRONMENT: AN ART AND DESIGN CASE STUDY

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ABSTRACT

What is new?	There is much debate on how to create research impact, but discussions often centre on the role of discipline, individual researchers, or systems to capture impact evidence. This paper considers if the secret to impact success lies in the relationship between research impact and research environments.
What was the approach?	Focussing on the Impact Case Studies submitted to Unit of Assessment 34: Art and Design: History, Practice and Theory in REF2014, this research used Content and Narrative Analysis to identify the characteristics of the Case Studies included in high-scoring Impact submissions as ranked by *Times Higher Education.*
What is the academic impact?	What emerged from this research was evidence of a nuanced relationship between research environment and research impact, with impact requiring an open, flexible and responsive research environment to flourish.

What is the wider impact?	For Research and Management Practitioners, these findings highlight a need to extend beyond the development of training, advice and databases and respond directly to the core purpose and ethos of research impact.
Keywords	Research Impact, Research Environment, Researcher Development.

INTRODUCTION

What does it really take to deliver research impact? Does the answer lie in the nature of the research? In the skills or behaviours of the researchers? Or the success of the systems in place to capture impact activity?

The introduction of the Research Excellence Framework 2014 (REF2014) Impact Assessment presented a number of challenges for the UK Higher Education sector, including how to define, demonstrate and support the generation of research impact: "an effect on, change or benefit to the economy, culture, public policy or services, health, the environment or quality of life, beyond academia" (HEFCE, 2011).

From Savage's experience as a Research Manager in a School of Art and Design, the questions highlighted above are often the focus of debates between academics and between academics and research support staff when the impact agenda comes under discussion. There has been significant focus on the effects impact assessment may have on theoretical research; the skills researchers may have to adopt; the usefulness of metrics, altmetrics and databases to capture research impact; and the development of toolkits to help academics translate their research findings to audiences beyond academia. But are these the right or only questions we should be asking?

In terms of research impact, Art and Design research may appear to sit outside of 'the norm', in that it is often applied or practice-based and can be characterised as designed to engage with research users or audiences. Whilst this lends itself to the development of research for the benefit of users beyond academia, many of the same issues relating to Impact Assessment still exist, such as attributing impact, capturing and evidencing impact, and researchers feeling they lack the skills to exploit the impact of their findings.

This led to the development of Savage's Professional Doctorate[i] study, which aims to develop effective strategies for supporting Art and Design researchers to demonstrate the impact of their research. (Professional doctorates are PhD-level research qualifications that focus on a specific professional context whilst contributing more broadly to professional practice.) The study was initiated following REF2014, firstly in response to assumptions in the sector that it was easier to demonstrate research impact for Design disciplines than Fine Art, and secondly due to concerns raised by academic staff about how to demonstrate impact; concerns that echoed those raised by the wider academic community.

In order to gain a deeper understanding of research impact for Art and Design, a review and analysis of the REF2014 Impact Case Studies submitted to *Unit of Assessment 34: Art and Design: History, Practice and Theory (UoA34)* was conducted with a view to answering the questions 'what is research impact in Art and Design' and 'how can research impact be demonstrated'. What emerged, however, was evidence of a nuanced and intrinsic relationship between research environment and research impact that extends beyond the development of training, advice and databases to the cultivation of an open, flexible and dynamic research environment that can respond to researcher needs.

The Impact Assessment: A Summary

Research assessments in the UK are an established part of academic life. Undertaken approximately every five to seven years on behalf of the UK Higher Education Funding Bodies, the assessment process is used to evaluate the quality of research and inform the allocation of public funding each Higher Education Institution (HEI) receives for research from their national funding body.

In 2014 the Research Excellence Framework (REF) was introduced to replace the Research Assessment Exercises (RAE). Like the RAE before it, REF2014 invited HEIs to submit their research to subject-based, peer-review panels, known as Units of Assessment (UoAs). Submissions consisted of three different elements that were assessed and given a score of 1*-4*, with 4* being the highest, or to be unclassified (those that did not meet the assessment criteria). The results were then weighted and combined to produce an overall quality profile. As with the RAE, the elements assessed included Research Outputs and Research Environments, but REF replaced a focus on Indicators of Esteem with one on Research Impact. For REF2014, the weightings of the assessed elements were 65% for Research Outputs, 15% for the Research Environment and 20% for Research Impact.

The history of the REF2014 impact assessment is now well documented. Formally introduced in 2011, HEIs were faced with the challenge of evidencing the Significance and Reach of impact from research that had taken place during a 20-year period. For most of that period, research impact had not been a key consideration for academics or HEIs. The sector therefore found itself having to understand and define research impact whilst retrospectively building narrative case studies for assessment by peer-review panels of academic researchers and expert research users.

The Impact element of each HEI's submission to a UoA included two or more Impact Case Studies outlining the underpinning research and resulting impacts, plus an Impact Template outlining the unit's strategic approach to supporting impact. The number of Impact Case Studies required in a submission was determined by the number of staff included in the UoA's submission. The rating profile combined the assessments of the individual case studies and the template, such that individual scores for each case study are not directly available.

REF2014's Impact Assessment was branded a success. Independent evaluation by The RAND Corporation (Manville et al, 2015a) found that researchers were able to describe the wider societal

benefits of their research and that these impacts could be assessed and compared. Panellists felt that the assessment was fair, reliable and robust, and that the different perspectives of academics and research users were valuable. An initial analysis of impact case studies by the Policy Institute at King's College London also found that the societal impacts of research were "considerable, diverse and fascinating" (Grant & Hinrichs, 2015), deriving from multiple fields of research.

In terms of value to HEIs, estimates vary, but it has been calculated that one impact case study receiving the highest, 4*, rating could be worth as much as £324,000 during a seven-year funding period (£46,300 per year), or five times more than the value of a single research output (Reed & Kerridge, 2017). As such, the value of research impact to institutions cannot be underestimated, particularly in light of the impact assessment's increased weighting from 20% to 25% for REF2021.

Literature Review

Whilst the Impact Assessment was touted a success, a growing body of literature creates a picture of a sector in flux. The initial announcement of the assessment in 2011 heightened concerns that a requirement for research impact could change the nature of academia and the behaviour of researchers, and in particular, diminish support for 'curiosity driven' or 'blue skies' research (Penfield *et al*, 2014; Bornmann, 2012). These concerns have evolved to question whether a focus on research impact will affect how individual disciplines, particularly in the Arts and Humanities, are valued by funders and society (Belfiore, 2015), but also to recognise the benefits of the exercise, primarily that the impact assessment allows academia to justify public spending on research (Manville *et al*, 2015a).

From this body of literature and focusing specifically on research impact in the Arts and Humanities, the five most common stands of debate that emerged were around the ability of specific subject areas to deliver impact, the role of the researcher, the type of impact generated, the importance of Impact Case Study narratives and the role of HEIs in supporting impact.

- Subject: One of the most consistent beliefs emanating from the literature is that regardless of subject area, it is always easier for other subjects to generate and demonstrate research impact (Smith et al, 2011, Penfield et al, 2014, Benneworth, 2015, Bastow et al, 2014, Reed & Chubb, 2018). Research has shown, however, that there are substantial similarities in the way different disciplines approach impact (Bastow et al, 2014, Molas-Gallart, 2015), suggesting that subject area may not be a significant barrier to developing research with impact.
- Researchers: Another common argument is that researchers need to develop new approaches and skills in order to generate impact from research. However, there is a growing consensus that impact must be planned, designed and managed alongside a piece of research rather than treated as an additional burden (Power, 2018; Reed, 2016). This is perhaps best demonstrated by the removal 'Pathways to Impact' plans and 'Impact Summary' from UK Research & Innovation funding applications from March 2020 in favour of viewing "impact as a core consideration throughout the grant application process" (UKRI, 2020).

When regarded as part of the research process, it is possible to see that a researcher's existing research skills and knowledge, such as collecting and analysing data, creating milestones, selecting appropriate methods for communicating results, etc, could be leveraged to meet impact requirements.

- Type of Impact: Whilst REF2014 showed that impacts were many and varied, it is also argued that there is a bias towards favouring research that leads to economic and policy impacts (Penfield *et al* 2014; Molas-Gallart, 2015). This is often predicated on the assumption that, where they occur, economic and policy impacts are easier to evidence because they are more likely to be linear and less subjective (Benneworth, 2015). It is hard to ignore this concern when a top-down focus on policy and economic impact is borne out in the requirements of funding programmes. For example, two 'main priority' areas for support from the UK's primary research funding body, UK Research and Innovation (UKRI), are the Global Challenges Research Fund (GCRF) and the Industrial Strategy Challenge Fund (ISCF). Established in 2016, GCRF seeks to support collaborative research that will improve the economic prosperity, welfare and quality of life of people in Low and Middle Income Countries (LMIC) and the ISCF (launched in 2017) focusses on bringing together academic research and industry to addresses the big societal challenges being faced by UK businesses.
- Case Study Narratives: Case study narratives provided an opportunity for submitting HEIs to develop arguments that demonstrate research impact and contextualised evidence. It is argued that Impact Case Studies are a new genre of writing (Reichard et al, 2020) that involves being able to select and present the 'right' indicators and distil highly complex ideas into an accessible piece of writing. With institutions reportedly hiring specialists to write impact narratives, concerns were raised and validated that panels did appear to have a bias towards well-written and presented case studies over those containing the "appropriate content" (Manville et al, 2015a, Reichard et al, 2020).
- Institutions: It is also argued that, in order to support the development of research impact, HEIs need to review their infrastructures and invest in cultural change (Carter, 2013; Littlewood *et al*, 2014; Molas-Gallart, 2015). This could include a complex combination of support for academic freedom, developing strategic approaches to impact assessments as well as structural changes (Manville et al, 2015b). Support for researchers may also require a change of perception within institutions themselves, where in the past, external engagement (i.e. impact activities) was seen to be at odds with the professional academic identity and therefore limiting career development (Comunian et al, 2014). Although this view may have started to change since REF2014, anecdotal evidence suggests that the wide-spread perception is that publishing remains the only way to advance a research career.

As a pilot study, the aim of this research was to gain a deeper understanding of how research impact was interpreted by Art and Design disciplines and identify effective ways of evidencing and demonstrating the impact of Art and Design research.

A sample of the 239 publicly-available Impact Case Studies submitted to *Unit of Assessment 34: Art and Design: History, Practice and Theory* (UoA34) were reviewed and analysed to identify the key characteristics of case studies included in highly-rated submissions. In order to analyse effective methods of describing and evidencing research impact, a sample of 124 Impact Case Studies was developed by identifying the UoA34 impact submissions ranked in the top and bottom 25% for impact by *Times Higher Education* (December 2014).

Times Higher Education (THE) is a weekly publication reporting specifically on news and issues related to Higher Education. It is traditionally one of the first publications to interpret Research Assessment results, and as such, is often the 'go to' publication for universities to compare their performance against other institutions. This is because, whilst the REF team and UK funding bodies publish the quality profiles awarded to REF submissions, they do not produce league tables. *THE* produces its league table by converting REF quality profiles into a Grade Point Average (GPA) and ranking them from highest to lowest. Where universities have the same GPA, they are ranked according to their research power, which is calculated by multiplying an institution's overall rounded GPA by the exact total number of full-time equivalent staff it submitted to the REF. The same method is used to produce league tables that compare overall performance between universities (by combining results for a single university across multiple Units of Assessment) and by subject (by comparing results within a single Unit of Assessment). The subject-specific league tables offer further detail by providing three separate tables ranking submissions by their Research Outputs, Environment and Impact.

After using *THE's* Impact league table to identify a sample of Art and Design Impact Case Studies, two approaches to Document Analysis were applied to draw out the characteristics of highly rated case studies:

1) Content Analysis, a "systematic, objective, quantitative analysis of message characteristics" (Neuendorf, 2002:1) to systematically review case studies and quantitatively identify dominant themes and characteristics (Dawson, 2009:122; Tharenou *et al*, 2007:258); and
2) Narrative Analysis, to further explore documents by observing facts and details about a text, such as what is said, how it is structured and organised, and how arguments are developed (Rapley & Flick, 2008:113).

The two methods were chosen to complement each other by providing an overview of patterns and themes alongside more detailed analysis and, where results converge (agree) to create a reasonably "true picture" (Gillham, 2000; Yin, 2014) of research impact for Art and Design. Content

Analysis was used to identify the main characteristics of the sample, before applying Narrative Analysis to a subsample in order to explore those characteristics in more detail.

Analysis concentrated on the content of Impact Case Studies and the types of evidence used to support impact claims. The evidence itself was not analysed as, unlike the Impact Case Studies, the supporting evidence was not made publicly available.

For the Content Analysis, the five strands of debate highlighted by the Literature Review were used to develop a coding scheme for analysis, along with the REF2014 guidance for completing the Impact Case Studies. The coding scheme identified specific units of data that could be counted and quantifiably identify dominant themes and characteristics (Table 1).

Table 1: Examples of Content Analysis Variables

Variable	Example Units of data
Subject area	Animation, architecture, ceramics, etc.
Output type	Advisory report, artefacts, etc.
Research age	0-5 years, 6-10 years, etc.
Research producer	Individual, research team, research group.
Impact claimed	Cultural, economic, work with Government/Charity/NGO, etc.
Corroborating Evidence	Advisory report, award/prize, book, etc.
Testimony Source	Industry representative, Policy representative, end user, etc.

The coding scheme was tested against five case studies from high-ranking submissions and five case studies from low-ranking submissions before being applied to the full sample. From the test sample, minor adjustments to the coding were made to reflect common elements found in the Impact Case Studies that were not highlighted by the literature review or REF2014 guidance, for example the use of public participation or coverage in Trade publications to evidence impact. Once all case studies were coded, a final list of units was established, and case studies reviewed again using the new codes.

Details of the overall impact submission were also recorded, including the number of case studies submitted by an HEI, observations on strategy documents, the Impact Templates, and the Grade Point Average (GPA) calculated by the *Times Higher Education* for each HEI's outputs, impact and

environment submissions. This additional data was used to contextualise individual case studies within the overall impact submission and impact results in relation to the overall REF return.

The relationships between variables were then tested using a combination of frequencies (Excel) and cross tabulations (SPSS) to explore the influence of the five debates highlighted by the literature review. For example, if there is a link between subject area or type of impact and how the Impact Case Studies were ranked by the UoA34 assessment panel.

Once broad patterns were established, Narrative Analysis was used to offer further insights. As with the Content Analysis, extreme sampling was used to identify a smaller subsample of 15 Case Studies. One of the questions that emerged from the Content Analysis was the role of subject area in relation to an HEI's approach. Consequently, a small sample was selected from the two subject areas with the largest volume of case studies in UoA34 – Fine Art and Product Design. Impact Case Studies were selected from the top five and bottom five submissions that included Fine Art and Product Design case studies. Where institutions were ranked equally, the submission was selected at random.

NVivo software (NVivo, 2018) was used to categorise statements that highlighted common approaches and how arguments were constructed and evidenced. Each submission's impact profile was not reviewed until the final round of analysis had been concluded to reduce unintentional bias during analysis.

The data was then used to draw out common characteristics amongst high ranking impact submissions. These were then compared with the characteristics of low ranking submissions with a view to refining questions around how to successfully demonstrate impact in order to direct a further, in-depth enquiry into supporting the generation of impact.

Results & Discussion

Subject Area

19 Art and Design subject areas were identified during the coding stage. Initial analysis comparing the mean rank of each subject quickly established that such comparisons were unreliable as the number of case studies attributed to each category varied greatly. For example, in a comparison of mean rank, one Archaeology case study ranked 3rd in the sample, whereas 26 Fine Art case studies ranked 56th.

Analysis therefore focused on the performance of two subject areas with a similar number of case studies in the sample.

- Fine Art: 21% (26) of case studies in sample, and
- Product Design: 20% (25) of case studies in sample.

To explore the nature of this relationship further, frequencies were used to identify how many case studies from each subject area were included in high- and low-ranking submissions and the

results clearly showed that a higher percentage of Product Design case studies were part of high-ranking submissions (84%) compared with Fine Art case studies (27%).

Table 2: Frequency Ranking of Fine Art and Product Design case studies

Subject Area	Ranked in top 25%		Ranked in bottom 25%		Total	
Fine Art	7	27%	19	73%	26	100%
Product Design	21	84%	4	16%	25	100%

As results for each submitting institution were presented as an overall Impact Profile (Fig.1), which combined the assessment of each Impact Case Study and the Impact Template, it is difficult to ascertain the score attributed to individual case studies. However, the Impact Profile for all-but-one of the high-ranking submissions was assessed to be 100% 3* and 4* standard, with 4* being the highest score possible in the assessment. Consequently, it can be assumed that the majority of Product Design case studies were judged to be of a 3* or 4* standard. Whilst there is a difference between a 3* and 4* Impact Case Studies, which can be significant when translated into the level of funding received (Reed & Kerridge, 2017), funding is only allocated to the elements of REF a submission judged to be 3* or above. Consequently, analysis focussed on determining the characteristics of impact case submissions judged to be 3* or above.

Table 3: UoA34 Average Profile with Impact Profile highlighted

	% 4*	% 3*	% 2*	% 1*	% U/C
Overall quality	26	42	25	6	1
Outputs	18.5	42.6	30	7.7	1.2
Impact	36.6	44.7	13.6	3.9	1.2
Environment	40.5	40.8	15.5	3	0.2

Two observations can be made from these results, the first being that Product Design significantly outperformed Fine Art in the Impact Assessment. However, it is also clear that there were examples of highly-rated Fine Art case studies. So, are there factors other than subject area that could have influenced the rating of case studies?

Looking at the overall profile (including Outputs, Environment and Impact), of the institutions submitting Fine Art and Product Design case studies ranked in UoA34's top quartile *overall* by *THE*:

- 4 institutions produced 4 Fine Art impact case studies
- 6 institutions produced 17 Product Design case studies

Of the institutions submitting Fine Art and Product Design case studies ranked in UoA34's bottom quartile *overall* by *THE*:

- 17 institutions produced 22 Fine Art impact case studies
- 5 institutions produced 8 Product Design case studies

Fine Art case studies were more likely to be submitted by institutions that ranked lower in all areas of the REF2014, suggesting a possible correlation between research excellence and research impact that is mirrored in other subject areas (Kellard & Sliwa, 2016; Temrama et al, 2016).

Further exploration of the Narrative Analysis sample also pointed towards additional factors that suggest research environments could contribute towards the disparity of Fine Art and Product Design Impact rankings. Three of the five lower-rated submissions included in the smaller Narrative Analysis sample did not make Art and Design returns to REF2014's predecessor, the RAE2008, suggesting less experience of the research assessment process. Pinar & Unlu (2020) found that, for UoA34, environment submissions made by Russell Group universities and universities with representation on the REF2014 panel tended to score higher. Whilst Pinar & Unlu suggested this was due to the 'halo effect', a bias towards certain institutions, an alternative explanation is that this enhanced performance was due to the level of experience and familiarity with the REF process.

Consequently, whilst there is a clear link between the subject area and rank of submissions for Fine Art and Product Design case studies, it could be misleading to attribute this solely to the influence of subject area as institutional strategies, research capacity or environment could also contribute towards these results.

Another significant finding linked to subject area that emerged from the Narrative Analysis was that cross-disciplinary impact rated higher than subject-specific impact. All high-ranking case studies were based on interdisciplinary research (i.e. involving collaborators during the research process) and produced cross-disciplinary impacts. Case studies from high-ranking submissions presented arguments for Art and Design research changing use of fuel types, developing wallpaper designs, the design of medical equipment and development of archival databases. The interdisciplinary nature of this group significantly marks it apart from case studies in lower ranking submissions, where the impact tended to remain within Art and Design, such as impact on audiences or design processes.

RESEARCHERS

The literature review suggested that one of the key barriers / drivers to the generation of impact from research is the characteristics of the researcher themselves (Bastow *et al,* 2014:103). Whilst it was not possible to contact or interview the individuals responsible for conducting the underpinning research it was possible to draw some conclusions based on how the underpinning research was produced.

Disciplines submitting to UoA34 have a long tradition of lone researchers, so it is no surprise that individual researchers produced 50% (62) of the Impact Case Studies included in the whole sample. When drawing comparisons between Impact Case Studies included in the sample's high- and low-ranking submissions, there is a greater instance of case studies based on the research of teams in higher-ranking submissions. 28% of the Impact Case Studies included in high-ranking submissions (21 of 79) referenced a Research Team compared to 19% of Impact Case Studies included in low-ranking submissions (9 of 48), suggesting that case studies based on research produced by teams is more likely to be rated higher. This finding is not unique to Art and Design, with a similar pattern being found across Panel D submissions (Marcella, 2018) and UoA19: Business and Management Studies (Kendell & Sliwa, 2016).

Working collaboratively as part of a research team and communicating impact beyond academia both require specific personal and professional skills, motivations and interest. Combined with the finding that interdisciplinary research resulting in cross-disciplinary impacts tended to be rated higher than those focusing on a single disciplinary field does indicate that approaches and behaviours adopted by researchers can influence the potential for research to develop significant impact.

What about a researcher's skills? The identification and analysis of keywords used in Leadership, Governance and Management Impact Case Studies found that researcher skills did contribute towards case study narratives (Marrow et al, 2017). For UoA34, a comparison of the 'Underpinning Research' and 'Details of Impact' sections of the Impact Case Study pro forma highlighted ways in which existing research skills contributed towards the development of an impact narrative. All case studies in the sample included an explicit or implicit research question or aim, methods, and a description of outcomes. Unlike sections focussed on impact narrative, which asked researchers to describe their work in a way that would have been new to many, the skills required to write the sections describing the underpinning research were very similar to those required to write a range of standard research outputs, such as journal articles or funding applications.

Using Narrative Analysis to compare the section detailing the underpinning research, a disparity was highlighted between the case studies included in high- and low-ranking submissions. High-ranking Impact Case Studies provide a clear account of the underpinning research, including collaborators, the institution's role in the collaboration, the question or problem addressed, research methods, etc. For example:

> "Research at the University of [X] providing original insights and new directions in the way that internet technologies and data can be embedded in the real world through being given physical forms has led to impacts that include:
>
> - Contribution to changes in the global organization [Y], its perspective of the internet;
> - Changes to the way [Z] approaches open data".

In comparison, low-ranking case studies tended to lack precision.

> "The website for arts, technology and social change [...] set out to provide an alternative, open, platform for artistic production and exchange in the context of the established [art] scene."

In the second example, the research problem is unclear, along with the potential research beneficiaries (artists, audiences or both?) and reach. These elements are obscured further in the case study by a lack of a clear research outcomes. This failure to adequately describe the underpinning research could indicate that the researcher lacks the skills required to adequately articulate their research.

However, it also reveals another pattern emerging from the sample, the blurring of research and practice in low-ranking submissions. For example, when asked to describe the underpinning research, those who are less familiar with research assessment can focus more on describing the process of the research, or the process of making (practice) rather than drawing out the research dimensions of the work, such as the creation of new knowledge and the significance of findings to the wider field. This is problematic for an impact case study; if it is difficult to identify the research content and results, it is even harder to identify the impact of those results. This issue was highlighted as a factor contributing to low-ranking submissions by the UoA34 panel report: "In some cases, claims for the impact of art practice were deemed intangible." (HEFCE, 2015:89)

Two possibilities are raised when this quote is viewed in light of the finding that the majority of Fine Art case studies were produced by HEIs ranked in the bottom 25% overall for outputs, environment and impact by *Times Higher Education*. It could suggest that subject area is a significant factor in determining the success of Impact Case Studies. But, it could also suggest that less support, research expertise or REF experience is available at those institutions. This is of particular relevance because, anecdotally, it is known that Impact Case Studies were not always authored by the individual researchers themselves, with some HEIs employing journalists to construct the narrative case studies. It is therefore unclear if the underpinning research sections were written by researchers, research support staff or external advisors.

Whilst it is not possible to conclusively ascertain from these results if researcher skills or behaviours affect the likelihood of research to generate impact, the results do show that, when considering best practice for supporting the development of research impact, viewing subject area, researcher skills and the role of the institution as separate entities is counterproductive. Rather, these elements are intrinsically interlinked; impact requires a motivated researcher working in a supportive environment. So, what might that supportive environment look like?

Type of impact

Some Arts and Humanities researchers argue that economic impact is preferred over other types of impact (Belfiore, 2015; Penfield *et al* 2014; Molas-Gallart, 2015). So, was this the case in REF2014?

The majority of impact case studies tended to cite more than one type of impact, for example, a case study based on research leading to a new product or service might also claim economic impact and impact on individuals. In order to establish if the type of impact claimed affected ranking, a comparison of average frequencies was used to determine the types of impact that were cited the most by high- and low-ranking submissions. Cultural impact was the most frequently cited impact in both UoA34's high- and low-ranking submissions, but was cited less in higher-ranking submissions – 21% opposed to 37%. High-ranking submissions were more likely to claim impact on understanding (18%), economic impact (16%) and new products and services (11%). In contrast, lower-ranking submissions commonly cited impact on individuals (17%) and understanding (15%) both of which could be viewed as subjective and harder to quantify in terms of reach and significance.

From these results, it could be tempting to conclude that submissions focussing on impacts on the economy, policy and new products / services were more likely to rank highly. However, the reason for this is not clear. It could be linked to subject area, particularly in relation to Product Design and the creation of new products. It could also reflect HEIs adopting risk-averse selection policies and submitting case studies they perceived to be more likely to score highly (Manville *et al,* 2015a, Temrama et al, 2016).

What is certain, however, is that high-ranking impact case studies claimed a greater number of impact types – an average of 2.75 different types compared to 2.06 types in case studies from low ranking submissions. This suggests that rather than promoting certain types of impact over others, a successful strategy could be to promote the development of a range of impacts. This does not appear to be unique to Art and Design; from the 6,679 Impact Case Studies submitted to REF2014 in total, researchers identified 3,709 unique impact pathways (Grant & Hinrichs, 2015).

This pattern is also present in the types of evidence used to demonstrate the impacts claimed. Impact Case Studies in the sample included a wide variety of evidence types and whilst it was not possible to demonstrate a strong link between the type of evidence and rank, case studies in higher-ranking submissions also included a greater range of evidence – an average of 7.37 different types compared to 5.68 in lower ranking case studies. Again, this suggests that variety rather than type contribute to how impact was assessed.

Both of these findings relating to type of impact claims and supporting evidence resonate with the ethos of the impact assessment. Impact Case Studies were assessed based on their 'Reach' and 'Significance'. It therefore follows that research that has been supported to develop a range of impacts can result in a higher-ranking Impact Case Study. A focus on variety could therefore represent a successful, alternative strategy to a focus on economic and policy impacts alone.

Case Study Narratives

The literature review raised concerns that the assessment process would unintentionally favour well-developed narratives. Reichard et al's (2020) detailed assessment of the content and language of impact case studies shows this concern to be valid, finding that highly-rated case studies were more likely to:

- Provide specific, high-magnitude and well-evidenced articulations of significance and reach
- Use distinct features to establish links between research and impact
- Be easy to understand and be well written
- Describe underpinning research findings, rather than research process.

These findings were also present in UoA34 case studies, but where this research departs from Reichard et al (2020) is to consider the context of production and the role of research institutions in authoring case studies.

High-ranking case studies used precise summary statements that provided an indication of how the underpinning research resulted in impact, the problem addressed, beneficiaries and reach.

> "By understanding driver's feeling of engine roughness or power changes with the chemical properties of the fuel, [X]'s interest in the research project was to identify a strategy to choose chemical compounds that meet and exceed customer expectations"

Information in high-ranking Impact Case Studies was layered into key messages that were repeated and reinforced throughout the case study in a variety of ways, which resulted in the broader range of impact claims and evidence used to support arguments.

In comparison, summary statements from lower-ranking case studies lacked clarity and precision. This not only made it difficult to identify impact claims, but also reduced the ability to repeat key messages. In extreme cases, the Impact Summary focused on the research rather than summarising the impact.

> "This case study describes impact derived from [X's] practice-as-research, during which, through painting and printmaking he sought to develop approaches to image making involving narrative structures […] The outcomes of the research were publicly exhibited and discussed in a variety of contexts during the period under review, thereby contributing to public engagement with, and understanding of, contemporary art"

Lower-ranking case studies were also more likely to include ineligible content, for example, references to academic impact or case studies relying on testimony and citations from other academics to support their argument. This use of academic sources to corroborate claims did little to demonstrate the reach and significance of the impact beyond academia.

Narrative Analysis also highlighted that it was not the type of impact claimed that made a significant difference to how case studies were ranked, but the quality of the claim and supporting evidence. High-ranking case studies made specific claims that were supported by appropriate evidence, often as part of the same or subsequent sentences. For example, the two quotes below show different approaches to evidencing impact through public engagement:

> "Associated with the exhibition were a wide range of public engagement events [...] These included educational sessions for schools (attended by 4,788 children/young people) and Arts and Health Programmes with [...] (child and mental health services) which 551 children and patients took part in, as well as adult programmes [...] (60 attendees)"

And

> "Prints from [...] were selected for The Northern Print Biennale 2009 (4 July-4 October 2009; Laing Gallery, Hatton Gallery and Northern Print; selectors: artists Stephen Chambers and Kip Gresham, and Senior Curator, Prints, V&A, Gill Saunders; visitors: 95,000)."

Whilst the numbers in this second quote are impressive, this figure evidences the number of people who attended the Biennale rather than how many people engaged with the work. Although neither narrative explicitly demonstrates that audiences were changed or benefitted from the research, the first example does provide appropriate evidence to demonstrate active engagement with the research and a significant likelihood that knowledge exchange occurred during educational workshops.

Evidence can also be used to tell the impact story on behalf of the case study:

> "We've currently made a 40 per cent reduction on last year's infection figures ... the commode is definitely part of that", said an Infection Prevention and Control Clinical Nurse Specialist for [the] NHS Trust."

This, the opening statement of a case study based on research to redesign a commode, employs user testimony to make a clear impact claim, links the research to the impact, highlights the beneficiaries, and indicates economic, health and wellbeing impact claims.

However, it is equally important to identify the most effective argument. A case study included in a low-ranking submission that focussed on redesigning a bag used in community nursing states:

> "In recognition of its ability to reduce MSSA/E-coli in health care communities by 30%, [it] was the only product to receive an NHS Innovation Challenge Prize award, with the judging panel describing the design as 'highly innovative'."

Whilst this is an equally impressive figure and statement as that discussing the commode, this case study does not expand on this statement or provide any further evidence, such as testimony from NHS users or management. Instead, it focuses on the impact of the prototyping process with healthcare workers, demonstrations at the researcher's own institution, the researcher's media appearances and new research. Although any one of these arguments could make a strong case

study, the combination results in a splintered argument and one focussed too much on the researcher.

Institutions

As indicated by the results presented here on the role of subject area, researchers, type of impact and case study narratives, institutions do influence the ranking of UoA34's impact case studies. This is partly attributed to the authoring of case studies narratives, but also the development of a strong research environment (Heyeres et al, 2019; Manville et al, 2015b; Temrama et al, 2016).

The Content Analysis shows that the subject area of the underpinning research and the type of impact claimed did affect case study rank, with Product Design and Economic impacts more likely to appear in the top 25%. However, there is also evidence to indicate that this may be the result of an HEI's expertise and approach to the REF assessment rather than an innate quality of the research:

- Three of the five lower-ranking institutions included in the Narrative Analysis subsample did not make a return to RAE2008;
- Analysis of the underpinning research section highlighted a disparity in case study authors' ability to summarise research, something that should be an existing skill for experienced researchers and/or research support staff, and;
- Research environments that enable interdisciplinary research and support a variety of external engagements and collaborations produced research that could demonstrate greater reach and significance beyond academia.

These results are supported by Kendall & Sliwa's analysis of Business and Management Impact Case Studies, which found that institutions in the top Ten for impact had a stronger ability to evidence their connection to external networks of decision-makers, users and stakeholders (Kendell & Sliwa, 2016).

Whilst it could be argued that some of this evidence is circumstantial, REF2021's move to abolish the Impact Template document, which described the submitting unit's approach to strategically supporting impact, in favour of an Environment Statement that also addresses research impact further indicates that the role of the research environment in generating research impact is worthy of further study.

Limitations

The analysis presented here is based on Impact Case Studies submitted to one unit of assessment in REF2014. As such, they represent responses to a particular set of guidelines and criteria at a specific point in time. As allocation of funding was attached to the outcome of the assessment, making the stakes high, the Impact Case Studies submitted to the REF2014 Impact assessment may not be representative of all Art and Design impacts. Rather, they may represent a selection of the most 'risk-averse' responses to the assessment exercise or examples of impact that best suited

the highly constrained Impact Case Study Template (Manville *et al,* 2015a; Power, 2018). Whilst this data provides deeper insights into the complex nature of Impact Case Studies and their production that can be applied more generally, assumptions cannot be made about the intentions of the submitting institution or assessment panels, for example, if economic impact was given preference by assessment panels, or if the selection of material was driven by HEI assumptions that economic impact would be reviewed more favourably.

Conclusion

The purpose of this pilot research was to conduct a broad analysis of the existing body of REF2014 Impact Case Studies, to refine questions and identify emerging themes for further exploration.

Whilst these findings show that the general tendency for UoA34 was for Impact Case Studies based on Product Design and/or claiming Economic or Policy impact to outperform Fine Art or other impact claims, this is not necessarily a black and white result; further research is required to establish if this is a consequence of sector expectations and 'risk averse' approaches based on the perception that economic and policy impacts are easier to describe and understand or a panel bias favouring specific types of impact.

What is clear from these results is that, in terms of managing and supporting the development of impact, best practice cannot be located by focussing on separate components that lead to impact, but how components come together to evidence variety and emphasise the reach and significance of research. This reflects the purpose and ethos at the very heart of the impact agenda, suggesting that impact is more likely to flourish as an outcome of research developed in a thriving, bottom-up research environment that is willing to take risks and support a wide range of activities.

The ongoing challenge for research managers is to move discussions on impact beyond being separate or 'other' from not just the research process, but also how research is supported. This requires the development of a holistic approach that enables impact-generating activities to flow from an engaged research environment that balances the needs of the organisation with the needs of researchers. This is reflected by REF2021's elimination of the Impact Template in favour of an Environment Statement that incorporates approaches to impact. It may include moving past the adage of 'publish or perish' as the only way to advance research careers in favour of balancing traditional research outputs with impact activities, across departments or within an individual's workload, and investing in variety by fostering external relations and providing the space for academics to explore interdisciplinary, perhaps unconventional, routes for research development.

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