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‘We Used to Be Somebody’, can the UK recapture its reputation as a world-leader in research and innovation? Considering the future of training researchers

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Abstract

The UK has recognised itself as a world leading educator, particularly in higher education where ten of the top 100 institutions are based in the UK. And yet, establishments such as the British Academy and the Royal Society are questioning whether the UK will continue to hold this recognition. Ahead of the recommissioning of Doctoral Training Partnerships (DTPs) in 2023, the Economic & Social Research Council (ESRC), one of seven council domains of UKRI (UK Research & Innovation, the largest funder of doctoral research in the UK distributing funding from the UK Government) has sought to understand what the ‘gap’ is and how to close it. The ESRC commissioned three projects (Adams & Neary, 2022; ESRC, 2022; Ferrie et al., 2022; Tazzyman et al., 2021) in preparation for recommissioning and this paper reviews their recommendations and anticipated impact on DTPs, and the education of doctoral researchers. Specifically, the plans to increase exposure of digital data and related skills/toolkits and project management skills including dissemination strategies will be evaluated. The paper critically asks how the new approach will benefit researchers with a focus on those intending to stay in the academy and those who choose to build a career ‘beyond’. To focus this critical work, an ‘alternative’ career pathway, that uses research skills but also dissemination and knowledge exchange skills, will be examined as a critical exemplar: journalism. This paper will close by considering the future for research methods training, at least within UK social sciences, and whether it meets the needs of doctoral researchers, whichever career pathway they intend to follow.

Keywords

Research, skills, pedagogy, training, non-academic careers, academic careers, digital skills

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Introduction

We are on the cusp of a significant change in how research methods will be taught to social science doctoral students in the UK. Why does this matter? This paper will explore the actors involved to explain why changes could potentially impact across UK Research & Innovation (UKRI) domains and internationally. The paper aims to review the changes, and to ask critically how changes proposed will (or will not) 'add value' to doctoral researchers. This paper will avoid using the word 'student', to recognise that doctoral researchers come to their PhD years with significant skills and often with some time (sometimes decades) in employment. The word learner appears when talking relative to a learning experience though we prefer to think of all researchers being learners (even if sometimes we are also educators).

Through 2019-2021, the Economic and Social Research Council (ESRC) commissioned three independent reviews in preparation for their commissioning of the second iteration of Doctoral Training Partnerships (DTPs): the 'Review of the PhD in the social sciences' (Tazzyman et al., 2021); 'Strengthening the role of training needs analysis in doctoral training' (Adams & Neary, 2022) and 'Scoping the skills needs in the social sciences' (Ferrie et al., 2022). Collectively, these independently delivered works aimed to address gaps in doctoral training, from content to delivery, with the outcome of delivering a doctoral learning experience that can produce world-leading researchers. This work was conducted at a time of growing concern for the success of UK doctoral training in the social sciences and beyond. The narrative went from The Royal Society, in a joint statement with the British Academy, Royal Academy of Engineering and The Academy of Medical Sciences, warning against the UK being "complacent about its reputation as a world leader in research and innovation" (The Royal Society, 2013, p. 10), to The British Academy arguing that the UK was not world-leading, with gaps appearing between the UK approach to research methods training for doctoral researchers and the education offered by other nations (The British Academy, 2016).

Others have been critical of the UK approach to PhD training, arguing that if the PhD is an apprenticeship (Park, 2005), then it is failing to capture the realities of research work post-doctorate:

> The socio-spatial parameters of work behind a PhD thesis are carefully constrained by the academic community, their rules and regulations. Governing it all, are the supervisors. As Hager points out (Hager, 2005) the community works by placing the authority for creating the learning space, on supervisors or those with similar status and rarely can students impact, intervene or transform the learning spaces available to them. Many social science students have reported that this model comes with isolation, and social alienation [...] (Ferrie & Scott, 2021, p. 23)

There is growing resistance to the isolating and alienating experience of PhD work, and in turn growing awareness that it contributes to a competitive culture within academia where only self-promotion leads to recognition and reward. Tazzyman et al. (2021) highlighted that UK social science PhD training was not producing confident researchers and that most doctoral researchers would benefit from time spent working in teams, and on placements doing research with real-world value. The Economic and Social Research Council, ESRC, (Adams & Neary, 2022) followed their recommendations (Tazzyman et al., 2021) acknowledging that the PhD was funded for too short a time to allow for doctoral

candidates to engage sufficiently in such experiences. Though the recommendation was to extend the PhD to a four-year funding period from the current three years, the ESRC has chosen to increase funding to three and a half years. The extra time comes with requirements to engage in a 'Research in practice' placement. This move aims to address gaps in researcher practice and moves beyond the idea that data collection and analysis skills are all that is needed (though it is these that dominate methods training; see Figure 1: 1). Rather, researchers must demonstrate their capacity to attract funding, to project manage, to work in teams, and to disseminate using various communication forums from elaborative academic writing to rhetorical tweets.

Though the remit of the ESRC is specifically the social sciences, the three reviews were encouraged to consider evidence from the other six research domains that sit within UKRI. As such, their examination of doctoral education and identification of 'gaps' has relevance to the UK Higher Education (HE) sector. The reports have influenced the ESRC training and development guidelines (ESRC, 2022). These latest guidelines set out the requirements for the training experience to be delivered by the next iteration of Doctoral Training Partnerships, DTPs, (funded from 2024-2029), and require a major shift in focus on research training. The 2015 guidelines (ESRC, 2015) looked for consistency and a standard student experience which has, in practice, become a one-size-fits-all model. All students have engaged with the same broad-based and skills-focused learning regardless of discipline, of prior learning, or of research ambition. The new version of the guidelines emphasises conceptual understanding of research approaches (rather than needing to have skills) and sufficient flexibility in the learning experience to practice research approaches that the doctoral candidate wishes to specialise in. Adams and Neary's (2022) report champions the use of Development Needs Analysis (DNAs, also clearly incorporated into the ESRC 2022 guidelines) and the ESRC will expect DTPs to offer training programmes, informed by DNAs, that not only deliver the skills required by individual students to complete their PhD research, but to plan for success in their career pathway of choice. This paper will focus specifically on what these reviews of doctoral education tell us about the future direction of research methods teaching and critically evaluate to what extent recommendations may add value, particularly to doctoral researchers who plan to build a career outwith the academy.

The paper will begin by examining literature that encapsulates the problems with the current model of doctoral training and will focus specifically on the one-size-fits-all approach and how this prevents 'connected' teaching and learning opportunities. The second problem critically addressed relates to the dominance of skill learning, particularly oriented towards data collection and analysis rather than a more holistic experience that captures researcher practice. The next section will examine the potential of doctoral training embracing a whole-project approach and the critical value of embedding digital skills throughout the learning. The paper will then examine a career pathway that uses researcher skills beyond the academy. An expert in the skills needs of journalists will reflect on the suitability of the new approach to support their students.

Defining 'the problems' with teaching/learning methods

All social scientists produce knowledge through their research and their teaching. All social science doctoral candidates will also, through their PhD work, produce knowledge and will expose their methodical process even if their work is not empirical (for example, the thesis makes a theoretical contribution). Learning methods well then, seems worthy

of investment. And yet, there is resistance. Teaching research methods is difficult (Williams et al., 2016). Learning them and becoming confident in using research skills is tough (Howard & Brady, 2015). Structural barriers reinforce negative attitudes to learning methods, particularly quantitative approaches (Ralston, 2019). For a wider discussion see the earlier paper in this special issue by Ferrie and Spreckelsen, this issue.

A recent wave of scholarship has examined what the problems are, and how we improve the teaching of research methods. The Ferrie Report's (Ferrie et al., 2022) focus on the pedagogy behind effective methods teaching was a strength of their review. In turn, it drew on a wealth of publications that have emerged from colleagues associated with the National Centre for Research Methods (NCRM), another significant investment from the ESRC (Lewthwaite & Nind, 2016; Nind, et al., 2019; Nind, Kilburn, & Luff, 2015; Nind, Kilburn, & Wiles, 2015; Nind & Lewthwaite, 2017, 2018).

The pedagogy of research methods teaching examines what happens in the classroom between educator and learner as well as acknowledging the wider socio-political context in which knowledge is produced (what students need to learn and why they need to learn it). As well as acknowledging the ontological routes of disciplines (the scientific, experimental drive of many psychology departments, the seeking progressive change defining sociology, the liberty versus justice debates of political scientists for example) the research methods educator also engages with what skills add value and how doctoral researchers can demonstrate rigour and robust ethical standards. There is broad agreement that teachers must 'connect' learning to their students' interests or at least topics they view as relevant to their wider learning. Pedagogy in the context of teaching research methods involves "the coming together of the teacher and learner and the production of knowledge is a political process with inherent implications for teaching practice" (Nind et al., 2016, p. 33). The call here is clear, teachers must connect with students, to know them and to be prepared to evolve the learning experience to their needs. As the Ferrie Report explains, good research methods teaching:

> [...] champions a more careful, learner-engaged strategy of a living pedagogy that evolves with each cohort. This is about process, rather than best practice, or designing the perfect programme to reach all learners, presented 'on repeat'. This is more than discipline or content, but about standpoint. Diversifying a reading list to be inclusive of disciplines is insufficient to meaningfully engage at this level, for this would only reach the idea of an average learner, rather than actual individual students and their specialist interests, which of course, will change year on year.' (Ferrie et al., 2022, p. 22)

A number of factors are preventing educators from crafting this kind of learning experience. The 2015 guidelines (ESRC, 2015) demanded a lot of content that was difficult to fit into masters training because of the volume. The emphasis on skills-learning has led to breadth, and a fairly shallow engagement with a wide range of methods. In the UK this has been influenced by the 42 requirements placed on core methods learning for ESRC funded students (ESRC, 2015). Commonly, three courses are required to fulfil the requirements, leading to a heavy focus on skill learning focusing on data collection or data analysis (see the first image captured in Figure 1) in qualitative approaches, quantitative approaches and research design. If the course teams work together to design their content, delivery, and assignments, then a cohesive learning experience is possible.

However, particularly between quantitative and qualitative courses, an adversary culture exists, leading students to claim allegiance to one and resistance to the other, a position often reinforced by educators in their disciplines and departments. The reality is that assignments don't work cohesively. Yet the courses emerging from the 2015 guidelines (ESRC, 2015) have been recognised as a gold standard because of their breadth.

The ESRC's insistence of a standard student experience in 2015 (ESRC, 2015) has resulted in these courses forming a one-size-fits-all approach, lacking flexibility required to deliver connected or specialist learning. In turn, larger class sizes and a lack of account taken for prior learning resulted in courses which started at the beginning and raced to the end in order to cover the guidelines in full. There is no space in this kind of curriculum for changes to be made, and the multi-disciplinary homes of the students in the large classes make connected learning through relevant readings or in class examples tough: if you improve inclusion of one group, you're probably excluding another. The new 2022 guidelines (ESRC, 2022) do suggest a cap on class sizes and for prior learning to be taken into account. The new guidelines state clearly that a culture shift is required moving forward to deliver flexibility and a move away from a one-size-fits-all approach. Flexibility is understood as recognition of prior learning and this ending the practice of all students starting their methods learning 'at the beginning', disciplinary norms around knowledge production, but above all, space to begin specialist learning of the method(s) doctoral researchers intend to use in their PhD.

The 'Review of the PhD' (Tazzyman et al., 2021) builds on decades of argument that the UK has insufficient expertise in advanced quantitative methods, and investment in this field is required. Further, all doctoral students in the social sciences should have at least a foundational and conceptual understanding of what quantitative approaches can do (ESRC, 2015; Payne, 2015; Vitae, 2011). The 2022 guidelines (ESRC, 2022) also recognise the need to capacity build in digital and big data skills, taking care to link gaps to qualitative researchers, not just quantitative. The requirements for DTPs are clear. Move to flexible approaches that connect with students, that begin specialised learning and that improves a broad-based conceptual understanding and reduces a broad-based skill learning.

Evaluation of the whole-project approach

In this section we will discuss the call to move research methods learning from a dominant focus on skills (data collection and analysis) and the 2022 guidelines (ESRC, 2022) call to embrace a whole-project approach including project management and dissemination strategies (Ferrie et al., 2022), see the second image of Figure 1. This transition allows for research work to be visible holistically, with time for students to engage in reflexive and experiential learning (Kilburn et al., 2014).

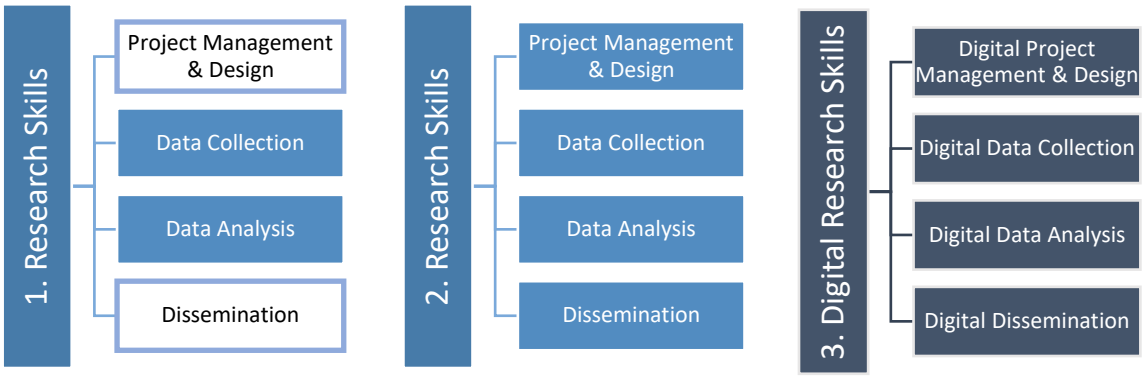

Figure 1. Three 'pillars' required to produce skilled and confident researchers: 1. The current dominance of data collection and analysis in doctoral training; 2. The need to engage doctoral students with project management and dissemination strategies; 3. The need to embed digital skills throughout training. Adapted from the Ferrie Report: (Ferrie et al., 2022, pp. 2, 42, 63)

In terms of the future for teaching research methods, there must always be caution when extending the content of programmes unlikely to be given more space in the curriculum. What could be removed then, to make space for the whole-project approach? The strong skill-focused approach in 2015, has evolved in the 2022 guidelines which champions 'conceptual' understanding (ESRC, 2022). Following recommendations from the Ferrie Report (Ferrie et al., 2022), the 2022 guidelines encourage understanding the context in which data is produced and informed decisions about how data should best be collected, collated and curated depending on the particular research project. The recommendations focus not on removing specific skill learning, but about emphasising a holistic whole-project approach allowing students to understand the project within the broader research context. From this foundation, students can then invest time learning the most relevant skills. Further, understanding data at this level is about research integrity. It is about an accurate representation of data and analysis as credible and robust. Here research integrity goes beyond reproducibility (which may focus on how data was collected or whether the analysis is repeatable) and considers ethics and whether the research is 'adding value' or is instead 'parasitic' (where research gains the authors' promotion or reputation and does not attempt to alleviate barriers to being and doing experienced by participants).

The project management gap identified relates to skills that may have been understood as 'transferable' (OECD, 2020). These are skills required to administrate research and are probably required by all disciplines. Thus, because there is generic demand, it seems they have been removed from social science research methods learning, becoming the property of education development colleagues. An unintended outcome of this, is that doctoral researchers and their supervisors have tended to view transferable skills learning as an add-on at best and not relevant at worst. Project management skills are about planning (pitching research ideas, preparing a bid proposal, costing and budget preparation), management (cleaning data files ready for analysis, fixing data inconsistencies, generating code lists) and bureaucracy (rules around intellectual

property, safeguarding data) (Ferrie et al., 2022). Colleagues in earlier stages of their research careers and established training leads contributing to Ferrie et al.'s work spoke about the gaps around project management being a major barrier to confidence and to autonomous working. Many felt that having these skills would allow doctoral researchers to understand better how to 'market' the skills they had harnessed in producing their particular PhD research.

Apart from adding in taught sessions on project management, educators of research methods could think about the reality of doing research, and how to replicate this as much as possible in the learning experience. There is evidence that using real-world data (rather than constructed teaching datasets) can improve learning particularly when it links to their area of interest (Atkinson, et al., 2006; Lindner, 2012), is data they have collected themselves (Strangfeld, 2013), and when they engage reflexively with their learning process (Denton, 2017). The ESRC champions (ESRC, 2022), supported by the findings of the 'Review of the PhD' (Tazzyman et al., 2021), for research methods learning to better represent real-world research practice and this includes using challenge-led assignments and working more closely with non-academic partners.

A clear future direction for teaching research methods is classroom-based collaboration with industrial partners. Wollschleger (2019) worked with local, non-profit organisations to embed real-world problems into the assignment. The Q-Step programme (advanced quantitative skills programme working through 17 UK universities) has pioneered the use of real-world data (Rosemberg et al., 2022). Ferrie and Scott (2021) describe a doctoral training programme that worked with social-justice oriented start-ups to give students space to work on real-world problems and pitch solutions.

As discussed in the section on the 'whole-project' approach, learning spaces need to provide a 'real' experience for students. A linear learning experience can lead students to think that research decisions become inevitable. For example, textbooks that cover recruitment often outline several potential strategies for accessing participants. Peer-reviewed journals may briefly discuss which strategy was employed and how many participants engaged. The reality is that recruitment never goes to plan, multiple strategies are utilised as time runs out and panic grows. The participants involved are not those the researcher anticipated. As we (as a teaching or publishing community) don't discuss these failures, when students encounter them, they internalise them as personal failings (Hume, 2007). More honesty and more exposure to the reality of research environments (Nind & Lewthwaite, 2017) will enable students to see how well they're doing, and to appreciate how pragmatic they need to be in producing rigorous and robust work. Recruitment is one example, learning the reality of building rapport (or how to handle themselves when it doesn't work); how to endure the boredom of endless transcription, or the frustration of cleaning data and developing a code that works (finding the typos, the missing comma), are others that need exposing to students.

Research in practice

A key recommendation from the 'Review of the PhD' (Tazzyman et al., 2021) was to make 'Research in Practice' placements an essential part of doctoral education. The ESRC are committed to deliver this programme and it is a central requirement in the commissioning of the second iteration of DTPs (ESRC, 2022). The placements aim to give doctoral researchers real-world experience of an employment-sector that meets their own career ambitions, or at least, exposes them to a sector they are curious about. The

design of the placement will expose students to a challenge-led environment (Tazzyman et al., 2021). At a smaller scale, such mission-oriented initiatives (Mazzucato, 2013) can be embedded in research methods courses via the assignment. In testing this proposition, Ferrie et al. (2022), found enormous support and excitement from students and teaching leads for assignments that brought teams of students together to respond to a challenge. Indeed, in their review of doctoral training partnership's delivery of advanced training, they showed a sustained increase in working with businesses to co-deliver events (Ferrie et al., 2022). For example, writing about Business Booster training, Ferrie and Scott (2021) demonstrate how supporting students to 'pitch' research-led solutions to businesses worked particularly well where the business was a start-up (and were able to clearly articulate a problem that they needed help with) and where the business had a social justice orientation (they may also have been a profit-making business, but students engaged well with a problem articulated as a 'mission' for social good).

Such collaborations worked at several levels. Students were excited about the problem-solving aspect of challenge-led learning (whether an assignment or a placement). Students that were able to work well in teams (this needed careful and sustained support from teaching teams) felt the pressure of an assignment or project was shared, that they could play to their strengths (taking ownership of an aspect of data collection or analysis rather than having to demonstrate a very broad set of skills and 'do it all'). Further, structuring learning through teamwork enabled students to practice communicating the value of their contribution (to team-mates) and this rehearsal improved their writing for the assignment. These elements combined to produce more confident researchers (Ferrie et al., 2022) who are practiced in defending their contribution rather than being defensive, a critical skill when it comes to writing methodology sections/chapters and performing at the viva.

Acknowledging the fourth revolution: Digital skills

The ESRC's (2022) guidelines call too for research methods learning to deliver vital skills and digital skills are in demand. Termed the 'fourth revolution', digital literacies are gateway skills to employment (European Commission, 2022). In the years since the ESRC published their 2015 guidelines for doctoral education, digital skills have gone from useful, to essential (OECD, 2020):

> The UK is at a tipping point where embedding such digital skills into doctoral training will be an asset for our UK-based scholars, and not doing this will cause a deficit in the UK's data-driven skill set within a few years. Unless this data-driven skill gap is closed, there may be an increasing divide within UK social sciences including UK doctoral candidates and those training overseas. Further, there is evidence that the digital divide exists across all research council domains, and in many competing nations. (Ferrie et al., 2022, p. 3)

Demand for digital skills

The ESRC's (2022) guidelines reference both Ferrie et al. (2022) and Tazzyman et al.'s (2021) evidence to champion a major shift to recognise and embed digital skill learning into doctoral education. Demand for digital skills is significant. It is estimated that 62% of UK companies require more digital capabilities (Mateos-Garcia et al., 2015). Further, industries that manage a large amount of data are struggling to fill vacancies where

digital skills are required (Windsor & Mateos-Garcia, 2015). In 2019, a 37% increase was reported between 2013 and 2017, in the number of posts that required digital skills in the UK (The Royal Society, 2019).

> 'Digital technologies and access to data are driving change, but human digital capacity and skills are likely to be the critical determinant of scientific success in the future.' (OECD, 2020, p. 8)

Doctoral students without digital skills are at risk of leaving their PhDs unqualified for the largest set of vacancies available, and this is further impacted by universities also seeking employees with strong digital competencies. There is also a growing trend of large tech companies allowing their researchers to publish, thus PhD graduates wishing to pursue a research-intensive career have a strong alternative to the university sector (The Royal Society, 2019). Roberts et al. (2013), writing almost 10 years ago, championed digital tools as a requirement for a relevant and culturally significant social science contribution, that was able to respond to contemporary issues. In terms of digital skills that are particularly related to researcher practice, there are four broad areas where learning could be enhanced (see the third image in Figure 1).

Digital skills in demand are less about data and more about 'digital approaches' (Moltzau, 2019). As with the project management skills identified in the section above, digital gaps are often around 'soft' or transferable skills, for example, curating knowledge in digital spaces, filtering data, data stewardship and protecting personal data (Collins et al., 2018). Linking this to research methods, during the pandemic qualitative researchers had to move their data collection practices online. The consequences of this for ethics were profound and extended to safeguarding self and participants' well-being. For example, conducting an interview online means the researcher cannot be sure the participant is alone. They may be unknowingly sharing the interview space with a friend or family member (who if present during a physical interview would be given ethical regard and asked to complete a form declaring their permissions to be potentially recorded). Covert participants may just be a question of bureaucracy, but potentially harmful (if that 'other' person is intentionally covert and listening-in to what the participant says). In either case, confidentiality and anonymity cannot be assured and yet, in many HE institutions, ethical structures have not caught up with the realities of conducting research 'digitally'.

Defining the digital skills gap

The definition of digital skills in Figure 1 aims to focus attention on areas where students and researchers should reflexively consider upskilling. The model starts with digital project management and captures research responsibilities including access to digital devices, data safety, and research integrity training. As discussed, digital ethics training is a growing area of interest. A good working knowledge of various platforms may be required depending on a student's research interests though most will need access to management software (such as Endnote) and to communication software (such as Zoom or Trello). Urgent upskilling is required in how to curate and store digitally (both digital and traditional data), and digital skills behind self-publishing data are increasingly seen as essential (Van den Eynden & Corti, 2017). Cleaning data and preparing data for a repository (the anonymisation of quantitative and qualitative data; ensuring all contextual documents, such as ethics applications are included) will also be essential skills.

There is evidence that the digital divide exists across all research council domains and in many nations worldwide (OECD, 2020). Closing the digital learning gap may require a cultural shift as they are skills that many established academics are awakening to (rather than experts in). To ensure that the next generation of doctoral researchers are exposed to adequate digital skill learning, there may need to be recruitment of early career scholars, many of whom were forced into digital data collection and other digital project skills during the pandemic. Established educators will need to upskill and may need to be taught by those earlier in their career. It is this kind of culture shift that the ESRC guidelines were calling for, or warning about (ESRC, 2022).

Digital data collection can be split into two categories: the collection of data available in digital worlds (for example, web-scraping skills) or the production of traditional data (such as interviews) using digital devices and software. There is a growing body of researchers working with big qualitative data and new strategies for harnessing this are appearing (Lewthwaite & Jamieson, 2019).

Digital data analysis requires good knowledge of available software and also the capacity of software that has been around for a while (e.g., NVivo) to manage digital data (Dowling & Wilson, 2017). This field also captures traditional forms of analysis, such as discourse analysis, on digital data, such as Twitter feeds. Researchers have embraced technologies over decades such as recording devices and software. So first, it should be recognised that most researchers have some digital skills. The shift here when considering digital data collection and analysis, is to recognise advances in managing very large data sets, or data that has only existed online.

The final element considers digital dissemination and building networks online, usually through social medias, that aid with knowledge exchange activities. Students learning about running a Twitter campaign (Dowling & Wilson, 2017; Rainford, 2016) or improving metrics on published work may feel premature (particularly if learning happens at the master's level before they have engaged with a project). However, many doctoral students have had research roles before starting their PhD and have work that they can promote.

While peer-reviewed journal articles are likely to remain the 'gold standard' there is growing pressure for researchers to engage with other forms of dissemination. For example, using social media to raise awareness of a published article can significantly increase metrics related to published work, such as downloads, which in turn can impact positively on the impact factor of a journal. Here public engagement skills, embedded into doctoral training, will help researchers develop an academic career and have clear value for other career pathways. A digital presence on social media helps train researchers into how to communicate to a broad audience, to capture the key contribution of their work, and attract attention to their scholarship. Researchers at the start of their careers are aware that they need to look beyond the readers of a journal in order to see their work engaged with. They can also learn much from online networks, about new publications, and who is working on similar topics/methodologies worldwide. Further, understanding how networking works enables students to plan a project holistically. The alternative of waiting until the PhD is submitted, or the paper published, means that students are building a dissemination campaign when they are exhausted and/or publicising their work to under-developed networks too small to really make a difference. Building networks online can help well-being as students engage with interested others (Bennett & Folley, 2014).

A key challenge for educating in this area is the very real lag between technological enhancements and structured teaching (Bone et al., 2016). To respond adequately, university courses may need to update particularly the digital elements of their courses annually and this means educators need time to update themselves on new forms of digital software, platforms, and technologies.

Bringing digital skills into the traditional curriculum: The Star Model

The 'Scoping the skills' review highlighted the need and urgency to build capacity through training doctoral researchers in digital skills (Henderson et al., 2016; Littlejohn et al., 2012) citing some participants who said that use of artificial intelligence (AI) and machine learning were becoming 'must have' skills for many researchers (Ferrie et al., 2022). Yet, they also evidenced the need to retain traditional skills and suggest an approach that addresses how research methods teaching might evolve (Fielding et al., 2019), see Figure 2.

In the Star Model, the case is made to retain traditional qualitative and quantitative research approaches within doctoral training and strengthen appreciations for 'researcher or academic development' or 'transferable skills' that are sought after by (non/academic) employers. Traditional learning/research approaches make up one of the triangles in the star. The other triangle captures digital skills in demand. While digital skills are increasingly sought after, the rigour built into traditional approaches has value. In producing robust research, even digital users need to return to the principles of quality and the highest standard of ethics, before critically developing new ways of applying these standards in the digital world.

Digital skills should not be viewed as an add-on to traditional course content for doctoral researchers. As Figure 2 shows, digital learning does not neatly overlap with traditional (this would produce two triangles, one hidden behind the other, rather than a star). Students keen to learn digital skills need the fundamental learning of traditional approaches. The placement of the digital triangle in the model has significance. The placement of digital data capture and storage between traditional qualitative and quantitative training demonstrates how a fusion of the two, usually presented as opposing forces with very separate teaching teams, could work.

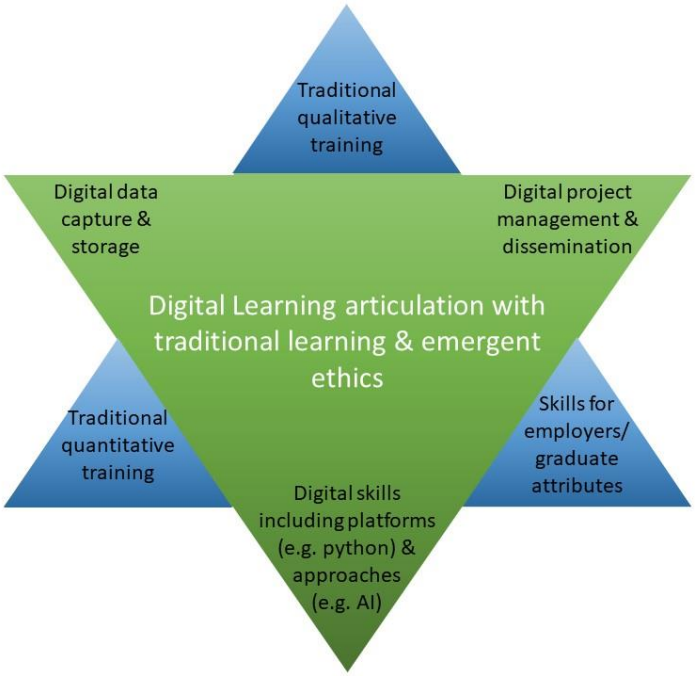

Figure 2. The Star Model: Digital learning articulation with traditional methods training, adapted from the Ferrie Report (Ferrie et al., 2022, p. 45)

The location of digital skills between quantitative methods and graduate attributes demonstrates the required learning of particular approaches to future-proof research in the academy (particularly, though not limited to, quantitative research) and research capabilities beyond universities. One example here is engaging with artificial intelligence approaches behind app development, or harnessing bid data held by industries to help them evolve their business strategy. The final point on the digital triangle captures digital project management skills and dissemination. These skills have clear links to employability and are placed closest to traditional qualitative methods because of the heavy engagement with words and symbols, and the study of communication inherent to so many qualitative approaches. Of course, these skills will be of value to quantitative methods researchers too.

The inclusion of digital skills and the representation of them in the Star Model allows us to visualise a course/training module that requires the fusion of qualitative and quantitative approaches. Separating this out into very distinct learning experiences no longer (if it ever did) provide the learning outcomes social researchers need. As a final point, ethics must be central and endeavours to ensure new approaches hit the highest standards require constant and critical vigilance.

Supporting career development in academic and non-academic pathways

A move to include project management skills should improve students' capacity to articulate their value to academic and industry sectors. A growing proportion of graduates move into jobs, often still using research skills, outside of HE, in business, government, and civil society sectors. In 2020, the proportion of doctoral researchers leaving academia was estimated at 42% (Vitae, 2020). Appealing to non-academic sectors, particularly for

research intensive roles, should be straightforward, but research from the Chartered Management Institute (2018) found that industry employers had an unfavourable view of the skill-set graduates came with: 86% do not have the interpersonal or communication skills required; 48% were not able to work effectively in teams and 48% did not have problem solving skills. Ferrie and Scott (2021) argue that students do have these skills but are practiced in 'marketing' outcome-focused performance (number of publications, number of conferences, prizes) rather than transferable skills. Though seven years old, Borrell-Damian et al.'s (2015) conclusion that industry-needs have to be communicated better to doctoral students, is still highly relevant and requires action.

This paper will now consider the training needs of researchers who plan a career in a non-academic, professional sector that still utilises research skills. The next section is written by co-author Forrest, an expert in training those seeking a media/journalism career. Following this, the new advances in research methods training will be evaluated with regard to entering the fields of journalism and other non-academic career pathways.

Training journalists – an expert view

The skills needs for students planning a career in journalism and communications are much discussed, at a time of great change in an industry which is by nature constantly evolving. With an ongoing decline in the consumption of traditional media such as TV and print (Reuters Institute, 2022) social media and online news consumption is filling the gap, although this same Reuters report finds that many are turning away from news altogether.

Journalists need a toolkit of skills which overlap with research methods training including ethics, research, understanding and evaluating data, building relationships with subjects or contributors, interviewing, active listening, compassion and empathy, writing, presenting findings clearly and succinctly, visualisation, and publishing and disseminating results. Media production can be viewed as project management of creative projects, fitting clearly with the evaluation of the whole-project approach earlier in this paper, and multiple synergies can be found between media practice and research methods training and their 'transferability'.

The fundamentals of journalism learning remain steady: journalism is about storytelling and stories are about people. In HE courses, ethics is front and centre and journalism training is about teaching learners to work with people with compassion and empathy, either via teamworking or a range of interactions which lead to the production of data. These human interactions produce the research which informs the journalistic storytelling, or interviews with contributors and the production or gathering of graphics and imagery which end up in the final output.

Presented in this way it is clear that while research methods and journalistic skills training use different terminology (for example, participants are contributors or sources) methods training is directly transferable to media careers. However, this may be opaque to learners who don't have previous industry or other workplace experience which would help them to recognise the relevance of methods training. For specialist disciplines (with journalism here as an example), methods educators could consider 'branding' their sessions and clearly signposting the relevance to the future workplace (or further academic activity). This is often backed up with sessions delivered by university employability and careers services, but some learners might be better able to grasp the

connection if their methods training was tailored to their discipline and the industrial applications carefully signposted. The defence of an idea is central to journalistic practice, as practitioners pitch their ideas to tough editorial boards or commissioners, and it is also central to the journalistic job interview. These elements (Ferrie et al., 2022) are highly valuable in building resilience and preparing media students for 'real life'.

Skills which repeatedly appear in journalism and media job adverts are teamwork, with ‘teamwork/collaboration’ being outstandingly the most common requested specialised skill in a recent study of job advertisements for a creative industries skills sector assessment (Skills Development Scotland (SDS), 2022). According to SDS, alongside teamwork and collaboration, other key skills requested are social media and project management skills. The need for data skills has grown rapidly, going beyond the ability to use specialist production and analytical software, to undertaking advanced investigative research and visualising data in ways which can enhance storytelling. An up-to-date knowledge of the Freedom of Information (FOI) legislation and process in the UK, and an awareness of the availability of public datasets, are essential tools in investigative journalism. Many newsrooms and factual storytelling teams now include roles for data journalists or ‘data people’, as well as specialist roles for fact-checkers as the rise of AI challenges and raises the status of the fact-checking task which was always inherent in journalistic practice. These are areas which can be addressed in journalism education in a range of creative ways, and while there is an urgent need for more meaningful inclusion of social media in journalism curriculum, the challenge of including high-level data skills is possibly the greatest challenge and the most relevant to this discussion of this paper. In terms of applied data and programming skills for journalists which lead to better storytelling, there is a perceived lack of discipline-relating skills training in higher education. Among many others, Columbia Journalism School has created ‘investigate.ai’ to teach ‘Practical data science for journalists’ (Soma, n.d.), and the Google News Initiative has range of data journalism courses at varying levels. As with the training of other industry-standard software such as Adobe, there is an argument to be had that these organisations and specialists are better able to provide cutting-edge skills training than a generalist HE course could.

There is a distinction between HE programmes designed to qualify learners for vocational journalism qualifications, such as those courses which lead to professional accreditation with the National Council for Training of Journalists (NCTJ) and the Chartered Institute of Public Relations (CIPR), versus courses which provide a broader and more critical media-related education in combination with an academic specialism such as the MSc in Media, Communications and International Journalism which is based in Sociology at the University of Glasgow. In all courses, research methods are key. Research is clearly a fundamental part of any journalist’s job, but in some cases, methods teaching causes confusion for some learners. The research skills for a practising journalist are about finding information, finding the right sources of information, and rapidly checking them, finding contact details to check and confirm sources, and to rapidly contact and interview contributors. In an HE setting, a tension exists between this rapid journalistic information-gathering practice and the slower and more in-depth practices which teach learners to originate their own research and data. Research ethics processes can form a barrier to students undertaking ‘journalistic’ research, and while these ethical processes are vital, they do create a disjoint between university and industry practice. This can lead to confusion and disappointment for students, either those who wish to go on to

academic careers or those who wish to work in media practice, and carefully designed training and coaching to support understanding of the different application of the concept of ‘research skills’ is of value to avoid this confusion.

Another important discussion is how to bridge the skills gap between journalism education and industry, and in a report from the World Journalism Education Council, WJEC, (Hill, 2022, p. 3) the authors seek “ways to improve students’ preparedness for the workplace of the present, while foreshadowing the newsroom of the future”. This need for a short, medium, and long-term approach to journalism education is clear. Recommendations from the WJEC encourage journalism educators to strive for ‘meaningful connections’ between educators and newsrooms, suggest the importance of sabbaticals in news environments for educators as well as for students, and highlight the importance of journalists taking part in courses, for example giving feedback on course and assessment design, or participating on advisory panels. The WJEC also highlight the role which students and educators can bring to newsrooms, newsrooms in turn learning about the future of ethical and compassionate ‘quality’ news storytelling, with carefully planned journalism education “foreshadowing the newsroom of the future” (Hill, 2022, p. 3).

Industry connections help make the methods ‘relevant’, with classroom-based collaborations including guest lectures or sessions with data journalists or other media practitioners bridging the gap between industry and education. We attempt to provide this bridge at various points during the practical journalism courses which are part of our taught Master’s in Media, Communications and International Journalism at the University of Glasgow. An example relevant to this paper is a lecture on investigative journalism for which we recently (in early 2023) invited Karin Goodwin, the co-editor of the investigative journalism platform ‘The Ferret’. Karin presented ways in which investigative journalists use data and spoke of the value of their ‘data person’ who works with them. She spoke about Freedom of Information legislation and the use of FOIs, and not only described the range of data which is available for journalists to examine and question but also gave real, current examples of how the Ferret team worked with data to produce impactful news stories, some of which had led to real-life social change via changes in legislation and practice. This session was inspiring, and Karin’s use of examples went a long way to helping emphasise the value of data and advanced research skills in journalism practice. We have committed to making sure that future sessions go one step further, making the connection to the research methods training which students undertook in the first semester of this one-year course. This could be done by teaching staff introduction 'topping and tailing' the lecture with this signposting. The industry speaker could be prompted to integrate this into the session, giving an authoritative bridge between journalism training, research methods and real impactful journalistic practice. Using real-world data can be highly valuable here, and in a programme where there is sparse time for the collection of their own data, students on this course would benefit from further encouragement to engage with publicly available data and the training which industrial partners and media organisations such as The Ferret and the Global Investigative Journalism Network (GIJN) offer and curate.

The 'real' experience for students, as discussed in the evaluation of the whole-project approach earlier in this paper, provides a space for 'real' panic and failures, which can be internalised by the student. This partly due to the pressure of time, and to ease this, discussions about the value and necessity of failure in journalism practice (or any

creative practice) need to be highlighted. Industry practitioners can emphasise, with honesty, the high failure rate of their pitches and their stories, as results show there is not a story to tell or the story is not 'newsworthy'. Pitched story ideas seldom turn out to be exactly the story which the journalist had envisioned, as many human and other factors require the storyteller to change and make compromises.

In summary, the training and guidelines discussed in this paper do close the gap in some respects. But what is most important in discipline-related education, at PhD or at master's level, is to maintain a keen understanding of the transferability of experience, of building confidence and empowering students, and of keeping a watchful eye on areas which perceived 'failure' might be addressed in a holistic approach to the curriculum. We must prepare to constantly evolve curriculum design and to collaborate with practitioners, skills agencies, and employers in order to fit the evolving needs of the industry.

Discussion and conclusion

There are a number of learning points from this expert piece. The very generic, broad-based and one-size-fits-all approach to research methods learning delivered as a response to the ESRC's (2015) guidance creates significant gaps from those learners who want to build a career that uses research skills, outside of the academy. The emphasis of that model on data collection may have had some relevance to budding journalists but the analysis less so. The new whole project approach though significantly adds value. The inclusion of project management skills reflects the practicalities of working, juggling priorities, working with budgets and team-work. The new focus on dissemination strategies, particularly those that include digital dissemination strategies, are relevant to the way journalists, and other non-academic researchers, work.

Digital skills are going to be massively useful too. Journalism as an industry has undergoing seismic change with skills relating to digital devices, digital data, and related issues of ethics and integrity becoming must-have skills. Related to this, a training approach that starts with Development Needs Analysis should pick up the career ambitions of students, and if methods training can respond adequately, then students wanting a career beyond the academy should have opportunities to practice these skills not just with traditional forms of research but with data that could form the basis of a news report. The Star Model also has value. The Star Model shows how digital approaches don't 'overlap' with traditional research methods courses, and it shows how they could work alongside traditional approaches. It would be interesting to consider what researcher training would look like if the traditional elements (qualitative, quantitative, research design) were removed. Would that leave the kind of training that journalists (and employers of journalists) would value? Would this approach provide enough research structure to demonstrate rigour, authenticity, and accuracy but enough freedom to move at a rapid pace? Understanding this better will help those who teach research methods in universities, who often practice traditional research methods, to understand how they can evolve their offer to engage students with non-academic career ambitions.

It is the 'Research in Practice' element of new PhD training that may have the most added value for those pursuing a career beyond the academy. The chance to work in a professional team could be transformative. Not just for students, but as mooted by the WJEC, also for educators, and for newsrooms themselves. Still, if we could extend the initiative to those who plan and deliver research methods courses so that they too,

established as they may be in their academic careers, can 'taste' life beyond the academy, then we can place some duty on educators to build the bridge between the classroom and the newsroom (or boardroom, or production suite) which will ultimately help learners approach their placements and internships. Equally, the move to welcome practitioners (in our expert view, journalists) into the methods classroom would help students from the start, to see how their methods training had relevance to multiple career pathways.

The ESRC's second iteration of DTPs will be funded from 2024, with successful partnerships developing their new approaches to training from autumn 2023. The direction of travel does appear to add value in that methods and research training becomes more relevant as it moves from a skill focus to whole project model. Evaluations are needed of course before any claims of 'world-leading' can be declared. There is potential though and positive advances promised.

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