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## LEARNING TO TEACH DATA JOURNALISM: INNOVATION, INFLUENCE AND CONSTRAINTS

Key words: data journalism, journalism education, stakeholder, teaching, socialization, student, university, marketization, innovation, higher education

### ABSTRACT

Journalism education has tended to respond slowly to developments in digital journalism, such as data journalism, despite or because of close links with the industry. This paper examines the obstacles to innovation in journalism education with particular reference to data journalism, drawing on the literature, a review of stakeholders and course documents, and the author's reflections on developing a data journalism module as part of a new MA programme. It highlights the complexities linked to the particular demands of data journalism, and identifies critical issues around student satisfaction; reputation and job/career outcomes; relevance, currency and appeal; programme management; and coherence. Rather than holding it back, more specialized socialization could assist journalism education to innovate effectively, the author suggests.

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## INTRODUCTION

Data journalism has evolved rapidly since some pioneers gathered in Europe in 2010 (Lorenz 2010, p.8). This was the year in which data journalism came of age, with the WikiLeaks war logs from Iraq and Afghanistan, and US embassy cables. 'Data-driven journalism is the future', declared the inventor of the worldwide web, Tim Berners Lee (Arthur 2010). That article's author wondered 'how long will it take for the methods of data journalism [...] to filter through to everyday use in journalism?', particularly as 'hardly any of the journalism courses today teach any sort of data analysis' (ibid).

By 2014, data journalism was 'mainstream' (Howard 2014, p.16) and had 'come into its own' (Newton 2013, p.61), present in large news organisations around the world, and some smaller ones, including hyperlocal media (Radcliffe 2013). Studies appear to confirm the growth of data journalism in Sweden (Appelgren & Nygren 2014), the USA (Fink & Anderson 2014), Norway (Karlsen & Stavelin 2014), Belgium (De Maeyer et al. 2014), Germany (Weinacht & Spiller 2014) and the UK (Hewett 2013). Data also emerges consistently as a theme in future-oriented reports (Newton 2013; New York Times 2014; eg BBC 2015).

This evolution of data journalism by practitioners has been accompanied by two principal forms of activity in journalism education. First, an evolving body of scholarship has emerged, examining relevant practice and theory, relations between journalism and computer science, and historical perspectives (Fink & Anderson 2014, pp.1–2). Second, some journalism educators have started courses on data journalism and/or integrated it into curricula. 'With employers increasingly demanding data skills, schools are paving the way for data education programs,' according to one US account (Krueger 2014). Apparently in response to the perception that 'data is arguably the single most important trend in media work today' (Culver 2014), some journalism schools have been reviewing their provision (Howard 2014, p.54).

Data journalism education has attracted little attention in the literature, beyond its important antecedent, computer-assisted reporting (eg Lee & Fleming 1995; Yarnall et al. 2008). It has been covered in publications that report on journalism, such as Nieman Lab, Journalism.co.uk and PBS MediaShift, and individuals blogging about their experience. A key focus has been the emergence of university courses and their curricula – particularly the skills and techniques that journalism students might need (see examples cited above). Textbooks have begun to incorporate data journalism, too (Holmes et al. 2012; Hill & Lashmar 2014; eg Bradshaw & Rohumaa 2011; Briggs 2010). An international collaborative project involving practitioners and advocates produced a handbook for anyone wanting to get started (Gray et al. 2012), and several massive open online courses have focused on data journalism (Howard 2013).

It may be significant that the latter examples originate from and/or extend outside university journalism education – which appears to resist practices often summarized as digital journalism. Technology tended to 'take a back seat' (Cohen 2001, p.5) and take journalism schools by surprise (Kelley 2007, p.25). Despite some initiatives, US journalism education is not changing far or fast enough, according to much of the discourse (Newton 2014; eg Finberg 2013), and 'far too few journalism programs are including data training' (Culver 2014). One list of data journalism courses, primarily at universities, noted just 24 worldwide in 2013 (Data Journalism Crew 2013). In the UK, one journalism educator concluded that 'the route into data journalism is not an obvious one and a period of studying journalism at a UK university certainly doesn't seem to be part of that route' (Hannaford 2014). Most journalism schools 'don't get it', according to the head of interactive news at the Financial Times (Tinworth 2014).

This paper seeks to examine the constraints and influences faced by journalism education in teaching data journalism. It addresses this issue in the form of critical reflection on the author's experience of establishing a data journalism module as part of a new MA programme in the UK, drawing also on the literature and a review of stakeholders and course documents. Combining these, it seeks to offer a greater understanding of the obstacles to innovation in journalism education and to the teaching and learning of data journalism, and how they might be addressed.

## RESISTANCE TO CHANGE

Discussion of change in journalism education needs to take account of two linked debates. First, how far should programmes concentrate on preparing students for employment and practical skills, rather than a more 'academic' approach strong on theory, critical or otherwise (see, for example, Deuze 2006; Folkerts 2014; Harcup 2011; Hirst 2010; Zelizer 2004)? Second, a lack of innovation – a focus of criticism (Folkerts 2014, p.21), attributed partly to journalism education being a 'handmaiden to industry, not its critic or visionary guide' (Dennis 1983, p.3), and thus linked to the first. It is not hard to see how innovation might be more prevalent where the mission resembles a development laboratory for journalism (Deuze 2006).

Resistance to change is attributed also to the prevalence of shared norms and socialization to the sector – a key goal of journalism education (Mensing 2010). With the rise of online publishing, Singer noted that 'one consistent reaction has been to seek to protect the journalism school's franchise (and that of the media industry) by emphasizing constants rather than change' (2003, p.150). Journalism educators keep to what they know, rather than introduce the unconventional or experimental (Stephens 2000). They perhaps lack relevant skills or experience needed to innovate and teach specialist areas – and the relatively high cost (per student) of small courses represents another obstacle, along with any organisation's tendency to change only slowly unless forced (Picard 2014). Others identified the 'inertia and glacial pace of change in academe' (Ghiglione 2001, p.16) and the conflicting pressures of employers' and academic priorities (Reese 2001, p.6).

One can argue that much of journalism has been slow to engage with technological change (Domingo et al. 2014) – so programmes operating in 'follower' mode have been accordingly slow. If those in 'innovator' mode have responded more quickly, perhaps their relatively low number has had little impact. But it is hard to disagree with Folkerts that 'journalism education has, to a great degree, ignored the larger contours of the digital age' (2014, p.63). Nor is education itself immune, affected by network effects, shifts in the student-teacher relationship etc (Johnson et al. 2014) and the increasing marketization of higher education (eg Molesworth et al. 2011).

In addition, the development of data journalism education may be impacted more profoundly and/or immediately than other areas of journalism education because of its interaction with other fields – notably statistics, computing, data science and visualization. For 'mainstream' journalism education, these may be an optional extra; for data journalism, they relate to its core functions.

## RESEARCH FOCUS

This article concentrates primarily on the context rather than the curriculum. This is not to underplay the latter's importance but to shed light on the more tacit, structural and less documented dimensions involved. Indeed, some analyses point to the wider context as essential for understanding the difficulties that journalism education has had in responding

to changes in journalism practice. Deuze warned that concentrating on curricular issues risked ignoring the – more important – contextual factors: ‘Most of the literature on journalism education starts at the curriculum. Many scholars, educators and media practitioners thus conveniently ignore the forces and decisions that defined the parameters within which any discussion of curricular matters takes place.’ (2006, p.28). Picard argued that reform ‘requires support and pressure from stakeholders of journalism programmes’ (2014) and Cohen (2002), too, noted the value in looking beyond the curriculum to wider issues of context.

This emphasis is suggested also by two inter-related shifts in higher education (identified above). First, the qualities of an increasingly networked society heighten the importance of dialogue with stakeholders (Jongbloed et al. 2008); second, the nature of the ‘marketised university’ intensifies such interactions (Barnett 2011, p.48).

This study uses two main approaches to illuminate the ‘defining parameters’ highlighted by Deuze: a review of stakeholders, and an analysis of key quality documents related to the programme. A stakeholder approach can identify a key dimension of context: those groups or individuals that affect or are affected by an entity (Freeman 1984, p.46). Extending the basic approach to include their ‘stakes’ provides a potentially valuable overview of their interests and interconnections (Jongbloed et al. 2008). This is complemented by an analysis of key documents from the first three years of the programme, produced as part of the university’s standard quality assurance processes. In effect, these highlight each year the points requiring further attention, and are raised primarily by students and by the programme’s external examiner, thus offering a broader perspective than the reflections of the author alone.

## STAKEHOLDERS AND THEIR INTERESTS

For the purposes of this study, a relatively simple model was applied, drawing on three papers (Burrows 1999; Jongbloed et al. 2008; Mainardes et al. 2010) to make an initial list of stakeholders, then reviewed and revised. Based on Mitchell et al (1997), three attributes were considered for each stakeholder: power, legitimacy and urgency. This prioritizes stakeholders by a ‘salience score’. A graduated version here scored 0.5 for an attribute either partially present or likely to vary significantly according to time or other context<sup>1</sup>. Finally, the stakes/interests were attributed, drawing on notes from the initial listing.

This approach was applied to the MA Interactive Journalism (MAIJ) programme at City University London, with particular regard to its data journalism module<sup>2</sup>. Five iterations, reviewing the provisional outcomes, resulted in the identification of 16 stakeholders. Six scored 2.5 or more and are listed with their salience attributes and score, and with their and the programme’s ‘interests/stake’. (As here, some stakeholder analysis involves the allocation of perceived attributes (Jongbloed et al. 2008), and the author recognizes the limitations involved, including the scope for subjectivity. A larger-scale piece of research might usefully solicit the views of stakeholders themselves.)

### ***[INSERT TABLE 1]***

## QUALITY DOCUMENTS

The review of documents involved three sets of material that the university produces each year for every programme, as part of standard quality assurance processes in the UK<sup>3</sup>:

- 1) The minutes of Student–Staff Liaison Committees (SSLCs), to which students’ representatives bring concerns.
- 2) Annual reports/notes from the external examiner of the MA Interactive Journalism.

### 3) The Annual Programme Evaluations (APEs), which draw on a range of evidence.

Every point related to the data journalism module was highlighted and summarized, along with its source document(s) and whether it was a positive point or for development/query. Duplicates were combined and the remainder identified as one of four types. The resulting 19 points appear in table 2. A further five points originating only from the author (raised in APEs) risk reflecting my own preoccupations, so are listed separately for the purposes of reflection.

#### ***INSERT TABLE 2***

#### EMERGING THEMES

Reflecting on the points identified in the stakeholder analysis and review of quality documents, five inter-related clusters emerge. (Some recur in the interests of stakeholders scored below 2.5 in table 1.) They can be regarded as indicators of key issues in the programme and its data journalism modules:

- Student satisfaction
- Reputation and job/career outcomes
- Relevance and currency
- Programme management
- Coherence and integrity

#### STUDENT SATISFACTION

Student satisfaction has become an important metric in HE, typically based on surveys (eg the National Student Survey and Postgraduate Taught Experience Survey<sup>4</sup>), often criticised by academics (eg Furedi 2012). Linked to the market-oriented conceptualization of students as consumers, it is used by universities in quality processes. Students are encouraged also to raise issues through elected course representatives and committees. Many students use informal channels, too, to raise points of (dis)satisfaction – both internally within the university as well as externally, where this can affect reputation (see below).

How satisfied have my students been? Certainly they raise points they find unsatisfactory, as is evident from the review of quality documents. Some of these relate to central services (eg IT, library) and need to be passed on to the relevant colleagues there. Points about teaching are more directly my responsibility – although here, too, I may be constrained. The third cohort complained about the large size of the data journalism class, for example. In response to a lower limit on class size (introduced for financial reasons) and interest from other students, the module had been opened also to the MA Science Journalism and taught in a combined class of more than 30. Students said they needed greater individual attention – and that the large computer room meant that learning from on-screen demonstrations (projected at the front) was difficult for those seated beyond the first few rows. Employing an alumnus to assist in class moderated the problems, but the intensive, hands-on data work clearly required smaller groups. These were reinstated the following year – but the case illustrates some of the cost/resource pressures that may impede data journalism teaching.

Another concern (for student satisfaction) was that some might find data work off-putting, whether it is the ‘Excel-bashing’ needed to reach baseline proficiency, or the learning of sufficient statistical analysis (which was a point raised by the external examiner). A tension with student satisfaction may exist in such cases, given that learning is not necessarily ‘an entirely painless process’ and that its rewards are not always immediately apparent (Maringe 2011, p.150). This was anticipated in structuring the module (eg explaining why it was needed; highlighting ‘quick wins’) and both tutors had a background in teaching data

journalism to those with no previous experience. Relevant here also may be the apparently weak mathematical abilities of journalism students (Cusatis & Martin-Kratzer 2009; Kelley 2007, p.25), a picture complemented by anecdotal accounts from educators and practitioners (see, for example, Culver 2014; Howard 2014). One experienced journalism educator in the UK claimed that ‘most students not only can’t handle basic mathematical concepts but are actually rather proud of this disabling incompetence’ (Frost 2013, p.166). It is not unusual, in my experience, to encounter candidates applying to Master’s journalism programmes who have an excellent academic background but struggle to calculate a percentage correctly.

Commenting online, some recently graduated alumni had ‘loathed data’ and found it ‘daunting to be sure’. These were tempered by comments about ‘fantastic and very patient’ tutors and that ‘you likely won’t have a chance to work closely with [tutors] James Ball or Paul Bradshaw on such a regular basis again’. A third former student working in data journalism wrote that ‘an understanding of using Excel and being able to spot an angle in numbers is not as hard a climb as you may think at this stage. Data skills helped me get a front page splash’ (comments below Clark 2013). In terms of ‘rewards’, some students might appreciate the value of their learning only later in their careers – if they move to a role with a greater emphasis on data, for example. If data continues to become more pervasive in journalism, might this shift to roles with a greater emphasis on data become more likely? Yet all but one of the MAIJ alumni working in data journalism have gone into data-oriented roles straight after finishing the programme, rather than changing to a more data-oriented role after a different initial job, for example. I suspect this reflects the relative shortage of skills and experience in this field, which means that it has not been difficult for students keen to pursue a career in data journalism to find one on graduation.

The data journalism module has been compulsory on the MAIJ. Envisaged as one of the distinctive components of the programme, this may, however, limit its appeal – and perhaps adversely affect student satisfaction scores. An alternative would be to offer it as an option to more students from different programmes; the corollary might be challenges in managing both practicalities and the coherence of the module (see below).

## REPUTATION AND JOB/CAREER OUTCOMES

Prospective postgraduates value greatly the reputation of an institution and a course’s career-enhancing potential (Leman et al. 2013). Reputation results from numerous influences, such as formal university material; online discussions, including social media; and personal contacts. A number of MAIJ students have mentioned unprompted that they sought out current and/or former students. These go beyond contacts at Open Evenings held for potential students, where current students help, and involve social media and other online discussions. Such interactions clearly have scope to operate negatively (putting off potential students) as well as positively, which tends to heighten the importance of ensuring that students are ‘satisfied’ and, in theory, to strengthen their position as ‘consumers’ in a marketised environment.

Reputation is mediated through employers, too, e.g. when potential students undertake work experience. This may be indirect, in that journalists convey the impression they themselves have formed of a course or university, for example; or more direct if they are alumni who can discuss their own experience. Before any MAIJ students had graduated, i.e. while recruiting the first two cohorts, its marketing material drew on the established reputation of (other) MA journalism courses at City. Only after that, in time to attract the third cohort, was it possible to point potential applicants to successful alumni from the first year who were working journalists, including in data roles. Interviews for the fourth intake showed that applicants were starting to meet working MAIJ alumni unprompted.

The article and comments cited above provide one example of an unplanned online interaction involving alumni, after when someone about to start the 'sister' programme wrote – on a site geared to journalism students – about whether to change to the MAIJ. Five recent Interactive alumni added their views in the comments, plus another City alumnus who wished he had switched; another prospective student with similar queries; and a visiting lecturer (Clark 2013). It is likely that other such exchanges occur (see, for example, Young-Powell 2014) but remain undocumented, representing a largely unknown but potentially important impact on reputation.

The positive points about job/career (see table 2) probably reflect the approach of the department. Material aimed at potential students highlights the successful journalism careers of alumni and the high employment rate of its graduates, for example. Practice-based work is combined with theory and reflection. Students are taught by former and current practitioners (as visiting lecturers), and encouraged to undertake work experience, and some of the curriculum is geared towards employability. In short, socialization plays a key part, and is a topic to which this paper returns later. The university positions itself as offering 'academic excellence for business and the professions' (Anon 2014).

Reputation is mediated also through other stakeholders, particularly news/media organisations. While alumni here form one 'channel', it is complemented by the regard, credibility and authority implicitly conferred (or not) by the industry in other ways beyond employing them (and their success as journalists). More incremental and diffuse, this kind of validation comes through personal contacts, visibility at industry events, a presence in relevant 'media about media' and online etc. Formal course accreditation is not relevant in this case; data journalism does not feature explicitly in the criteria of the relevant professional bodies in the UK.

As for actual job outcomes, all the MAIJ graduates went on to paid work in journalism or related fields in media. The proportion entering data journalism has increased year-on-year, and of the third Interactive cohort of 15, five are working as data journalists, plus four in data-related roles. This compares to one plus three respectively out of the first cohort of ten, and four plus one in the second cohort of 11. It may reflect the programme (and its graduates) becoming better known, as well as a possible increase in relevant roles.

## RELEVANCE AND CURRENCY

The credibility of a professionally oriented programme depends also on its relevance and currency, although cutting-edge practice almost inevitably outstrips the curriculum (Breen 1996; Simon 1969). Relevance and currency pose challenges in the learning and teaching of a newer areas such as data journalism more acutely than in the case of longer-established aspects of journalism, such as reporting or interviewing. The involvement of practising data journalists in developing the curriculum and in teaching helps to address this, but any individual is likely to be constrained by the extent of their own experience and what they know of others' practice. In a rapidly evolving, divergent and interdisciplinary field, this may not be sufficient.

For any subject, the curriculum depends primarily on the intended learning outcomes; learning/teaching activities and assessment tasks/criteria stem from these (Biggs 2003, pp.26–29). While the learning outcomes can be developed in consultation with practitioners, researchers and colleagues, a challenge arises here from the relatively short history of data journalism, and its continuing evolution – notwithstanding its important roots in computer-assisted reporting (Hewett 2013). There is little by way of an established 'canon' or agreed body of knowledge, theory and practices on which to base a curriculum. It is a work in progress, with continuing fluidity, differing approaches, and a relatively small corpus



(compared to other aspects of journalism) of 'classic' examples of the kind that journalism educators tend to draw upon for case studies and other learning activities.

The data journalism module has addressed this challenge by taking an approach akin to continued professional development, highlighting current practice. One assessment requires students to blog about their own progress as data journalists and encourages them to regard data journalism as, in effect, a beat for their reporting. This builds on experiential learning and social constructivist approaches in journalism education (see, for example, Rhodes 2008; Schwalbe 2009). Students publish posts on their own sites and/or on their collaboratively run website. Typically they include: 'how to' posts; critical analysis of pieces of data journalism; interviews with practitioners; their own data journalism practice – including experimentation – and reflections on this; and the evaluation of relevant new tools or techniques.

As well as underlining current practice in data journalism, this approach has a range of potential pedagogical benefits (based on research evidence from a range of disciplines), linked with independent, active and collaborative learning (Hewett et al. 2014). By encouraging critical reflection, it aims to support professional development (Sheridan Burns 2004). The structure and activities help students to collaborate and operate effectively in the environment of modern networked journalism. They foster, too, an open approach and independent learning (important for future career development) that involves contact with practitioners and peers – reflecting a key element in the practice and growth of data journalism, identified by Howard (2014). This also tends to enhance the profile of the students in the field of data journalism and among potential employers.

Linked to the curriculum is the 'million-dollar question' (McKerral 2013) of suitable teachers of data journalism. Both issues were raised consistently in a 1995 CAR survey of US practitioners and educators (Lee & Fleming 1995). For most academic staff, any background as practitioners is likely to predate data journalism, and those in the UK are less able to draw on experience in computer-assisted reporting than those in the USA (Hewett 2013). Journalism schools typically supplement their core staff by involving practising journalists as visiting lecturers, which helps to address questions of currency. But the pool of individuals with current experience as data journalists is small, and an employer's demands on their sought-after skills and experience may make it difficult to accommodate teaching. Calling on data journalists (some with relevant teaching experience) and a pioneering trainer/practitioner, as well as alumni, has proved essential for the MAIJ.

## PROGRAMME MANAGEMENT

Any programme places demands on the internal infrastructure – human, physical, technological and educational – and its management. How distinctive are these for data journalism? For us, it involved additional demands on facilities, such as teaching rooms and computer labs, and a relatively small cohort was accommodated without too many difficulties (eg by reworking the timetable). More substantial were concerns about equipment and institutional matters, echoing a CAR survey (Lee & Fleming 1995), although computing costs are now a minor issue.

Some IT issues needed attention, primarily to install specialist software (eg Tableau and Open Refine). In some cases, this involved technical difficulties (eg memory or server settings, licensing, and permissions for browser add-ons) that the university's central IT Services addressed. But as neither they nor the department's 'tech team' supported 'non-core' software, students' queries tended to devolve to the teaching staff. If there was a benefit here, it was in encouraging students to become more resourceful and learn to solve such problems themselves (sometimes with staff reminders about targeted online searching and useful fora). Problem-solving abilities of this kind are an important skill in data

journalism and sought by employers (Hirst 2013) but such cases also highlight additional demands that data journalism teaching may produce.

Other workload issues cannot be ignored, although a small increase in staffing moderated the effect of some colleagues and I having to teach slightly larger classes, and some other modules are subject to annually fluctuating numbers in any case. More challenging have been the demands of managing two programmes rather than one (and the associated paperwork, marketing, student recruitment etc) and the additional interactions, internal and external, in fields specific to data eg open data, data science, statistics.

## COHERENCE AND INTEGRITY

The interface with other modules, programmes and teaching staff represents another aspect requiring management. One example involved a small part of a core Online Journalism module offering an introduction to data journalism. Little could be done to entirely avoid this overlap (being the only data journalism input for other MA students). It was flagged up to at least alert students. 'Joining up' learning and teaching also meant ensuring that students would start a Freedom of Information (FoI) project (in a Journalism Practice module) before starting their data journalism projects. FoI offers students a gateway to data journalism as it often involves datasets (typically numbers), the analysis of changes over time, and pattern-detection. It introduces aspects of computational thinking (Wing 2006) and many students have used FoI effectively in their data journalism. It proved essential to the development of data journalism in the UK (Hewett 2013).

Such points raise consideration of the overall integrity and coherence of the programme – both its scope and, for example, where ethical issues related to data journalism (see, for example, Bradshaw 2015) are best addressed: in a module dedicated to data journalism or one focused on ethical and professional standards? Similar questions arise in relation to the law, and even public administration (eg in relation to the data-related activities of public bodies). This illustrates some of the difficulties familiar to many educators of parceling up practice into discrete modules – contrary, in many ways, to the demands of real-world activity and understanding a discipline holistically (Trowler 1998, pp.90–91).

Developing the MAIJ as a digital journalism MA with data as a core element, rather than as a narrower data journalism programme, perhaps ensured its feasibility, but may have limited its scope and ambition. Greater emphasis on data would need some existing elements to be omitted from the curriculum (Wenger & Owens 2012, p.10), and further specialization. More on statistical analysis, visualization/design and programming are prime candidates. This might be consistent with the field maturing, along with the expectations (and experience) of students and employers. However, the picture appears mixed; some employers want depth; some prefer breadth (see, for example, Stabe 2015). The scope here for greater collaboration with other departments in the university has yet to be realized; the initial timescale overtook discussions on how to coordinate modules.

## SOCIALIZATION REVISITED

The question of socialization permeates many of the issues identified above. It is simultaneously a key part of (many) journalism programmes (Becker et al. 1987, p.19) and identified as an obstacle to innovation and the reform (Domingo et al. 2014; Mensing 2010). But what if socialization were geared less to long-established practices of journalism and more to newer, still developing norms and practices of data journalism (and other 'new forms')? Such boundaries between 'old' and 'new' may not always be evident, but data journalism has less of the traditions and "'best practices" of the previous generation' (Mensing 2010: 515) that tend to constrain fresh approaches.

What might socialization of this kind look like in practice? Students taught by currently practising data journalists. Internships of relevant data work alongside established professionals, ideally with interdisciplinary teams (eg web developers and designers). Students learning explicitly about new and changing practices, ideas and approaches. They would hear and learn from others working in data journalism (not only those formally teaching them) and in related fields (eg computing and open data). Mathematical, statistical and technological literacy – and, indeed, high levels of competence – would be essential, almost assumed. So would, for example, finding stories in data; understanding its structure and context; gathering, cleaning and analysing it; and presenting data stories. Important, too, might be working collaboratively with other specialists; and exploring new tools, techniques and theoretical approaches.

Some of this is evident in the MAIJ and its data journalism module. Students learn from practising data journalists, for example, including core techniques. Placements are encouraged where they can develop these. They are assessed partly on discovering what is going on in the field of data, and – explicitly – on their own experimentation and reflections. They are encouraged to look beyond the formal curriculum and to network and attend events such as Hacks/Hackers and the Mozilla Festival. The building of useful networks is part also of the MAIJ module on strategic social media.

## THE MARKET

The influence of the market-oriented approach in HE is evident in the stakeholder analysis. As Knight identified, ‘academic staff increasingly have to attend to competition and image management’ (2002, p.10). This study suggests one might add student satisfaction and recruitment. Attracting students and their tuition fees (or other external funding) was key to developing the MAIJ. But it was interest from employers and an anticipated fall in demand for other sister programmes, rather than clear interest from (potential) students, that were key drivers, in terms of the ‘market’.

Consider the perspective of potential students. Many may simply not know of data journalism, as one later recalled (Scott 2015) and others have told me. It is, after all, a rare beast in student media and local newspapers (and radio), which predominate in our postgraduate journalism applicants’ work experience. Even in national news organisations, where some have interned, data journalism is largely confined to specific enclosures, and students are unlikely to encounter it ‘close up’ unless they seek it out.

This may change, with one regional newspaper group running a data unit (McAthy 2013) and indications that student journalism may be involving more data journalism (see, for example, Frost 2012; Halliday 2013). But if to most would-be journalism students it remains an obscure specialism, as well as to parents and university career advisers, will data journalism education be constrained by a lack of appeal? Furthermore, what do potential and actual students – whom market-led universities need to attract and ‘satisfy’ – make of studying it? How do they view data analysis and statistics, particularly if they are ‘arts graduates who dropped maths and the sciences as early on in their education as possible’ (Burn-Murdoch 2013, p.155)? Some advanced techniques may deter students, suggested Denham (1996, p.57), and US journalism faculty feared ‘alienating prospective students’ with data analysis (Yarnall et al. 2008, p.159).

## CONCLUSIONS

This study highlights some of the complexities involved in developing a programme that offers a dedicated data journalism module. These stem partly from the additional, new demands on staff, other resources and services – and sometimes students – that it involves. Integrating data journalism smoothly with existing modules/teaching has proved a

challenge, as have links with fields unfamiliar not only to much of journalism (eg statistics and computing) but also to its students and educators.

While the specific circumstances of the programme examined in this paper have to be taken into account in considering any wider applicability of conclusions, it leads me to offer some questions that may be relevant to other journalism educators.

First and fundamentally, what is the place of the data journalism education being offered to students? Is it one course or option within a wider programme (probably more generalist/introductory) or the main focus (more specialist), for example? How far does it assume previous relevant learning or experience, or involve few if any prerequisites? What about the balance (and levels) of theory, practice, experimentation, and the use of specific tools and techniques?

Second, and again part of Deuze's contextual factors (2006), consider the 'supporting infrastructure' as well as the curriculum content – points such as computing resources, the learning environment, group size, links with colleagues in other disciplines, and how the data journalism teaching will interface with other modules or courses. Teaching and administrative workloads must be addressed, too, and at least some of the extensively documented resistance to change in journalism education may have to be tackled (see literature review above).

Third, how will data journalism education operate in the context (in many countries) of an increasingly market-oriented HE sector? The costs of establishing and running a data journalism programme may be at odds with the expectations placed on academics to attract and 'satisfy' students. Despite promising job prospects, data journalism risks being rejected as unappealing by potential students with an arts or humanities background, prevalent among this established 'market', and to whom it may simply be unfamiliar. Engaging successful alumni (as well as current students and perhaps employers) may have an important role to play here in addressing the concerns of prospective students.

Fourth, how are data journalists involved, and perhaps other practitioners? Are they the main teachers, specialist instructors, and/or guest speakers? How else will students interact with and learn from practitioners, whether on placement, at events with networking opportunities, freelancing, or through social media? Do these include specialists in related areas, such as statistics, information design, computing, open data and freedom of information? Will these or other approaches help to ensure the currency of what students learn, in a diverse field that is developing rapidly?

This study suggests that socialization with practitioners is not incompatible with innovation in journalism education. What may be involved is more selective socialization that is focused (in this case) specifically on data journalism. A key argument against socialization in journalism education is that it reinforces past patterns of practice (thus resisting innovation) and marginalizes critical reflection and experimentation. But data journalism, as a more recently established field with norms and practices that are still evolving, is arguably more fluid and welcoming to such approaches. This may also be a reflection of the more open and networked nature of data journalism compared to CAR (Coddington, 2014).

Such complexities arguably exacerbate some of the challenges in innovating effectively in journalism education (see review section above). Data journalism can be seen partly as an extension of the 'traditional' areas that journalism programmes have long taught: discovering relevant facts, verifying (and disputing) claims, reporting and analysis, for example, and builds on CAR. But many aspects bring journalism education into fields with which it is much less familiar. With apologies to Star Trek, one could say that this is journalism but not as we know it – or not as many journalism educators have known it.

As this appears to be the first study of data journalism education that is focused on a single programme, conclusions are necessarily tentative and limited in wider applicability. However, this paper raises suitable questions for further investigation. What approaches are deployed, and constraints encountered, elsewhere in data and other innovations in journalism education, for example? An international comparative study of different programmes (including curriculum content) could be valuable. We need to know more about students' views and experiences, and the effects of their status increasingly as 'consumers' or 'customers'. Are pedagogical innovations required to enable journalism education to embrace data (and other areas) more fully and maintain currency? Finally, could a clearer emphasis on (critically) reflective practice offer a way forward here, while also taking us beyond the perceived split between 'vocational' and 'academic' journalism education?

[ENDS]

TABLE 1: MAIN STAKEHOLDERS, THE PROGRAMME, AND THEIR INTERESTS/STAKE

<i>Stakeholder</i>	<i>Salience attributes score</i>		<i>Stakeholder interests/stake</i>	<i>Programme interests/stake</i>
Current students	PLU	3	<ul style="list-style-type: none"> <li>• Student satisfaction (inc worthwhile course, learning experience, value for money)</li> <li>• Job/career</li> <li>• Academic success</li> </ul>	<ul style="list-style-type: none"> <li>• Viability of programme</li> <li>• Reputation</li> <li>• Future alumni</li> <li>• Feedback about the course</li> </ul>
Colleagues teaching on course	PLU	3	<ul style="list-style-type: none"> <li>• Surriculum and teaching</li> <li>• Students learning</li> <li>• Academic success</li> <li>• Coherence with other modules</li> </ul>	<i>As their interests/stake, plus:</i> <ul style="list-style-type: none"> <li>• staff satisfaction</li> <li>• success of teaching and learning</li> <li>• effective 'infrastructure'</li> </ul>
Professional services (in the university)	PLU	3	<ul style="list-style-type: none"> <li>• Effective support/services to students, eg IT, marketing, library</li> </ul>	<i>As stakeholder, plus:</i> <ul style="list-style-type: none"> <li>• avoid problems affecting students</li> <li>• effective support to staff</li> </ul>
Potential students	PL(U)	2.5	<i>As for current students, plus:</i> <ul style="list-style-type: none"> <li>• learn about programme</li> <li>• gain entry to programme</li> </ul>	<i>As for current students, plus:</i> <ul style="list-style-type: none"> <li>• attracting suitable applicants</li> <li>• marketing/external communications</li> </ul>
News/media organisations	PL(U)	2.5	<ul style="list-style-type: none"> <li>• Potential interns/employees</li> <li>• Their appropriate specialist skills/understanding</li> <li>• Relevance of programme</li> <li>• Potential collaboration</li> </ul>	<ul style="list-style-type: none"> <li>• Input to programme (eg guest speakers)</li> <li>• Opportunities for students (eg internships)</li> <li>• Credibility, reputation, authority</li> <li>• Cooperative relationship</li> <li>• Competencies of students, effective teaching/learning</li> </ul>
Other colleagues in the Department of Journalism	(P)LU	2.5	<ul style="list-style-type: none"> <li>• Shared knowledge/experience from programme</li> <li>• Coherence with shared modules</li> <li>• Positive impact on their students</li> <li>• No adverse effect on access to facilities etc</li> </ul>	<ul style="list-style-type: none"> <li>• Effective cooperation with colleagues, involving consultation and planning</li> <li>• Coherence with shared modules</li> <li>• Managing demands on/access to facilities</li> <li>• Avoid adverse impact on their course/students</li> </ul>

Other stakeholders identified, but with a salience score of 1.5 or less, were:

Students' parents and other family members; bursary/scholar-ship provider; students on 'sister' programmes; alumni; journalism educators elsewhere; educational and other researchers; other data-relevant organisations; other Departments within university; training/accreditation bodies.

## Notes

1. Salience attributes are listed as P for power, L for legitimacy, U for urgency (following Mitchell, Agle, & Wood, 1997).
2. Where shown in parentheses, the attribute is deemed either partially present or variable according to time or other context.
3. Salience score is based on a total of 1 for each attribute present, and 0.5 for partially/variably present attributes (as note 2 above).
4. 'Interests/stake' can be considered as essentially 'what stakeholders want from or for' the MAIJ programme (and data journalism module in particular) and vice-versa in column four.

TABLE 2: POINTS EMERGING FROM REVIEW OF QUALITY DOCUMENTS

<b><i>Point raised</i></b>	<b><i>Type</i></b>	<b><i>✓or ??</i></b>
Relevance of features work queried	Coh	??
Coherence with Online Journalism module	Coh	??
Slow wifi/network connection	Fac/res	??
Access to more databases	Fac/res	??
IT problems in Mac lab	Fac/res	??
Room used for data journalism class/size of class	Fac/res	??
Staffing levels	Fac/res	??
Networking with recent alumni	Job	✓
Availability of tutors for careers advice	Job	✓
Taking FoI work from class to publication helps job applications	Job	✓
Running course blog about data journalism etc	Job	✓
Students well-networked with journalists and relevant outlets	Job	✓
Work primarily with live/real data in class	T&L	??
Longer/intensive data classes	T&L	✓
Learning activities for a wide range of ability	T&L	??
Small group workshops/seminars	T&L	✓
Visiting speakers	T&L	✓
Quality of teaching and learning	T&L	✓
Scope for more in-depth analytical work	T&L	??
<b><i>Points raised only by author</i></b>		
Identity, coherence, relationship with other MAs	Coh	??
Liaison/engagement with external stakeholders	Coh	??
Internal infrastructure/support	Fac/res	??
Student recruitment/publicity	**	✓
Innovations in teaching	T&L	✓

NOTES

Coh = coherence (of programme)

Fac/res = facilities/resources

Job = job and careers

T&L = teaching and learning

\*\* = not classified

✓ = positive; ?? = for development/query



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## NOTES

<sup>1</sup> For example, a potential student, suitably qualified and wishing to apply, might be 'high urgency' (=1), particularly at a time when attracting such candidates appeared challenging. Other candidates and/or at other times might be scored 0.5.

<sup>2</sup> This is a full-time, one-year programme that includes two modules developed specifically for it: one on data journalism and one on (strategic) social media, online communities and engagement (SMCE). Other modules are shared with 'sister' MA journalism programmes, notably the MA Newspaper Journalism; despite its name (kept partly for reputation and marketing), this includes extensive online and multimedia work. The MAIJ was intended as a digital journalism programme rather than one focused exclusively on data.

<sup>3</sup> For more on this system, see <http://www.qaa.ac.uk/assuring-standards-and-quality/the-quality-code>

<sup>4</sup> PTES data is not available at MAIJ programme level, but wider results indicate generally high levels of satisfaction within the Department of Journalism.

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