NEW DIRECTIONS FOR THE DOCTORAL THESIS

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ABSTRACT

Purpose — This chapter focuses on the impact of digitization on the conception, development and examination of the doctoral thesis in the contemporary university.

Methodology — The approach taken is that of reflective inquiry. The author has taken a lead role in the editing of two handbooks for Sage: one on e-learning research and the other on the digital dissertation/thesis, and this chapter reflects on the changes taking place in higher education as a result of digitization. A number of examples are used to illustrate the possibilities afforded by digitization not only at doctoral levels but also in all dissertations.

Findings — It is proposed that digitization affects not only the conception and direction of doctoral research for the student but it has implications also for supervisors, those who ‘upgrade’ work from MPhil to PhD levels and also for examiners and librarians. Changes in the format of the presentation of the digital thesis allow moving image and sound, as well as still images, to be incorporated into the main body of the text rather than be relegated to an appendix (e.g. in a CD-Rom).
The storage of the completed thesis in digital form, via a number of different repositories, allows for greater access and use.

Research implications — One of the major implications of the digital thesis is that all universities must regularly re-visit their regulations to ensure that the parameters for doctoral research are clear, and that they are appropriate for the kind of research that is undertaken by students.

Many universities are now making a digital copy of the thesis for principal submission, with print copies as optional.

Originality and significance — Consideration of the implications of the digital thesis for students and universities is essential not only in terms of knowledge creation but also in terms of validation of such knowledge and its dissemination and use.

Keywords: Digital dissertation; digital thesis; higher education; supervision; examination; dissemination

INTRODUCTION

In the Handbook of Digital Dissertations and Theses (Andrews, Borg, Boyd Davis, Domingo, & England, 2012), my fellow editors and authors mapped out what impact, we thought, digitization has on the nature and format of the dissertation and thesis. Our approach, though initially focussed on doctorates, was applied in the end to any kind of dissertation — at undergraduate, Masters and doctoral levels. In this chapter, however, I focus more sharply again on the doctoral thesis: its function, its possibilities and what these say about the nature of knowledge creation at doctoral level within a wider context of the present volume, with its focus on leadership and policy implications. I include consideration of the possible direction that digitization can afford to the doctoral student but also look at the kinds of knowledge that are being generated by the contemporary doctorate in the arts, social sciences and humanities. My approach — typical of someone with a background in the communication arts (see Andrews, 2014) — begins with the nature and format of the contemporary doctorate but moves backwards and forwards between the genre itself and the social and political contexts of the genre. It looks at current practice in an education and social science research institution with a large cohort of doctoral researchers where
digitization and multi-modality have impacted on the creation, development and examination of the doctoral thesis.

Digitization is changing the nature of doctoral submission, though the possibilities of this shift are yet to be fully realized in practice. For some years, many universities in the United Kingdom have required, like many universities worldwide, that the final written (printed) thesis submission — two copies, softbound until approved by the examiners and then hardbound for the library shelves and public access — should be accompanied by a digital version in Word or in a pdf format. It makes sense for candidates to submit the initial version in Word as well as printed form so that amendments and corrections can be incorporated after the viva. The finally approved thesis can be submitted in pdf and then stored digitally by the university in its repository of theses, as well as submitted to EthOS at the British Library. But from the period since 2010, the guidance for submission has been changing. In a pivotal and indicative shift of practice (and possibility) in 2013 at my own university, the digital submission became an option as the principal text, with the printed softbound copies an accessory to the digital version.

Such practices have been evident since at least 2010 when the University of Illinois at Urbana-Champaign, more radically, indicated to its doctoral students that it would no longer accept printed, softbound or hardbound copies but would receive only the digital version of the thesis. Readership of the submitted digital theses increased 10-fold in the first year. Such a change in submission requirements has a potentially profound impact on the whole doctoral research process. Knowing that digital submission is required will encourage some students to conceive of their research projects, ab initio, differently. A major consideration will be the degree to which multi-modal approaches to the presentation of the thesis are included. Multi-modality suggests the inclusion of word, still image, moving image, sound, gesture etc., and it is possible to conceive of a study that embraces some or all of these modes of communication. Such a broad use of and combination of modes have been possible in arts-based research for decades — art installations, exhibitions and sculptures are presented, usually as part of the doctoral submission (accompanied by a ‘critical’ dimension, conventionally supplied in word form). But the practice is relatively new in the humanities and social sciences, bound as they have been more conventionally in the ‘classic’ verbal (spoken and written) tradition. However, photographs or other forms of digital still image have already become part of the conventional printed thesis. Now, as digitization influences practice more deeply, an arts, humanities or social sciences research
student could incorporate, for example, documentary film as part of their submission.

The reciprocal relationship between new technologies on the one hand and new practices and forms of knowledge creation on the other has implications beyond that of format and presentation. Among these implications are increased researcher agency, a changing relationship between research/doctoral study and the student researcher and the process of research. In the following sections, I try to chart some of these changes.

CONCEPTION

The conception of the research topic, and its subsequent treatment by the research student, needs to be dwelled on further before we move to other implications of the digital thesis. These may continue to be about a topic in a post hoc approach. Such post hoc abstraction is partly a result of the nature of the verbal mode: it consists of critical, reflective words about phenomena. However, the inclusion of other modes of communication and representation means that the researcher and the reader can get closer to the primary experience that is being investigated. Instead of (or as well as) writing about film, the researcher can show the film or film extracts; instead of (or as well as) writing about music through the prisms of, first, notation, and second, critical verbal commentary on such notation, the researcher can actually present the music itself as part of the thesis. One could see the proximity of the primary material as a threat to research if we conceive of research only as an abstracted, reflective activity mediated by words. If research means, to paraphrase an eighteenth century definition of research in music, ‘the seeking of patterns of harmony which once found, are used in the piece to played afterwards’ (think of pattern-seeking in data through analysis, which once found can be applied to real-world problems and solutions), then those patterns need to be identified and shown in primary data, even though they might be analysed in another mode.

Such presentational possibilities raise the question of how studies are framed (see Andrews, 2010), and these need to be made clear in the introduction to a thesis so that all who read it are clear about the paradigm within which the research project is undertaken, and more pragmatically, what to expect — and how to read it — as they embark on the ‘reading’ of the thesis.

What does this more direct form of communication in the doctoral thesis say about knowledge and the creation of new knowledge? First, that
academic framing of knowledge need not be bound by the verbal code, and that other forms of ‘knowing’ — visual, aural, synaesthetic, tactile, kinetic — can be validated. Second, that the layering of critical commentary can be arranged and weighted by the research student to indicate precisely where his or her focus of attention is, and how that modal focus of attention is related to other modes. Third, that ‘an original contribution to knowledge’ (never well-defined) can take even more various forms, from the offering of new perspectives, to the re-configuration of existing ideas and assumptions, to the presentation of new material and so on.

Fourth, what kinds of argument are presented by a digital thesis that uses a wide set of possibilities as set out above? Argument (the product) and argumentation (the process) are likely to continue to be central to the criteria for success at doctoral level as they are at both Masters and undergraduate levels. Does the move away from a necessarily linear argumentational sequence in the conventional written/printed thesis — say, in the presentation of a thesis in a website form, where the points of entry are multiple and where the material need not necessarily be read in a prescribed order — compromise the argument of a thesis or could the argument be (partially) constructed by the reader? Can a set of images argue? Can a musical composition be said to make an argument, irrespective of whether it is accompanied by 40,000 words of written critical commentary or not?

We are faced here with issues of implied argument and explicit arguments. Doctoral work tends to the explicit because it is set within an academic context. But such explicitness is not always the choice of those presenting theses for examination and is not a worldwide universality: a doctoral study on the historical emergence of manga as an educational tool, for example (Ellis, 2008), eschewed explicit articulation of its thesis within a Japanese tradition of suggestion and implicitness rather than the somewhat less refined practice of explicit exposition.

Issues around the conception of the digital thesis are considered here because these are central to the kinds of knowledge that are anticipated in a doctoral course of study and to the student who is embarking on that course. The next matter to consider is the supervision of that course of study and its implications for the process of research as the basis of a thesis or dissertation.

SUPERVISION

Supervisors are key not only to the development of a research student’s research project, particularly in the structural design of the thesis (the
principal aspect that supervisors can be held to account for if the student is not successful), but also for the depth of scholarship, the elegance of the design overall, the degree of theory that is introduced and the methodological rigour. Above all, the supervisor’s role is to guide (navigate) the student successfully through the demands and rituals of the doctoral journey. It is thus all the more important, when there is a new direction to navigate, that the supervisor — even if he or she has not travelled the specific territory — is able to map-read and work with the student to ensure a successful passage. Again, this responsibility for navigation comes back to the regulations of the university and the guidance offered to the student in terms of criteria for success.

The regulations at one UK higher education institution include the following (I have included only those that are relevant to the argument of this chapter; details about length of registration, eligibility etc. are left out):

The MPhil/PhD thesis must

6.3.1 consist of the candidate’s own account of his/her investigations;
6.3.2 be an integrated whole and present a coherent argument;
6.3.3 include a full bibliography and references;
6.3.4 be written in English and of a satisfactory standard of literary presentation. (2012 regulations, p. 6)

and perhaps more pointedly for the purposes of this chapter:

6.10 If appropriate to the field of study, and subject to approval by the Academic Registrar, a candidate may undertake research leading to the submission of a portfolio of original artistic or technological work undertaken during his/her period of registration. The work may take the form of, for example, objects, images, films, performances, musical compositions, webpages or software, but must be documented or recorded in the portfolio by means appropriate for the purposes of examination and eventual deposit in the Institute library. The portfolio must include written commentary on each item of artistic or technological work and either an extended analysis of one item or a dissertation on a related theme. The written commentaries and extended analysis or dissertation must together be no more than 40,000 words. (ibid., p. 7)

I will take up four main areas in these regulations that a supervisor and student must address if the student decides to go down the route of less conventional thesis. These are the nature of the argument, the bibliography and references, the portfolio and the written element. Collectively, these provide the framework for the thesis and, as such, require the guidance of the supervisor.

Discussion of how argument manifests itself in a multi-modal, digital thesis was begun above. It also needs to be said that the argument can take
various forms. It need not proceed via some of the conventional models, like the proving or disproving of a hypothesis or the sequential and logical or quasi-logical setting out of a position. What it must contain is a series (not necessarily chronological or logical) of propositions supported by evidence and a critically informed position taken by the researcher. This series of propositions can be spatially arranged, like paintings in a gallery or pages on a website where it is up to the reader to determine the sequence in which the elements are experienced, thereby creating their own narrative — and by implication, argument — of the experience. The critically informed position is a matter of development through the material, weighted up by the researcher with a view to find his or her own position in relation to it (to the ‘existing body of knowledge’).

The scholarship in a digital multi-modal thesis need be no different from that in a conventional thesis. There will be references and/or a bibliography. These can be presented separately as they are in a conventional social sciences thesis, or as footnotes, as is the convention in a humanities thesis. Scholarship will also include a critical and careful examination of the problem or the topic analysed.

The portfolio is the position taken by the university in question for the specific purposes ‘of examination and eventual deposit in the Institute library’. That is to say, the submitted work cannot be a website or a film or an installation per se, but the artefact must be contained with a portfolio (this could be an electronic folder) along with a ‘written commentary’. This regulation is central to the argument of this chapter because it defines what is allowed by the university and the format in which the doctoral submission must be contained.

The relatively conservative positioning of this university is reflected in its insistence that there should be ‘written commentary on each item of artistic or technological work and either an extended analysis of one item or a dissertation on a related theme’ of not more than 40,000 words. The written commentary on one item could be on the only item contained in the portfolio, if there is not more than one. If there is a collection or series of items — as in a critical catalogue of an exhibition — there needs to be a commentary on each item. In addition — not as an alternative — there needs to be an extended (critical) analysis of one item or a dissertation. There is thus some degree of choice for the researcher as to what they put in the portfolio. The written element is deemed to take up about half of the full submission. Sometimes, the artefact is termed the ‘creative’ element and the written commentary the ‘critical’ element, but the distinction is a blurred one. There is no reason why the artefact cannot be critical in its
response to an existing context. A fuller discussion of the spectrum of possibilities for the submission and form of a doctoral thesis is contained in Andrews and England (2012). We can imagine at one end of the spectrum, the conventional written thesis and at the other end, a thesis that contains no words at all.

UPGRADE AND EXAMINATION

Most doctoral degrees — and certainly the MPhil/PhD route — require the consideration of an ‘upgrade’ from MPhil to PhD registration during the course of study. In effect, this often takes the form of an interim ‘viva’ in which the student’s work is subjected to close perusal by academics other than the supervisor. Some universities also make provision for an internal reader to undertake a critical look at the draft thesis before it is submitted. Along with the formal examination at the end of the process, these occasions have in common the critical and formative assessment of the student’s work.

The experience and imagination which the internal readers and internal and external examiners bring to the process of review is crucial to the success and future direction of the student. An examiner or internal reader of work who has digitally submitted (and in which the student brings an iPad or other tablet to the meeting rather than a printed document) must be sensitive not only to the format in which the work is presented but also to the paradigm in which the student is working. Assuming this to be within the framework of regulations, the research paradigm — how the research is approached, what values underpin it, what counts as evidence, what place sequentiality plays in the work etc. — is crucial to its appropriate consideration. It follows that either experience, imagination or training is required for internal readers and examiners who are invited to take part in the doctoral degree process. There are thus implications for institutions to make sure such academic staff are properly prepared.

It is in the management of upgrade and examination, and the wider responsibilities that are bound up with them, that institutions can take a leading role in re-thinking the parameters for the doctoral dissertation or thesis. Heads of doctoral or graduate schools have a complex job, often concerned with applying and interpreting the detailed rules of submission, upgrading and examination. The exciting challenge for institutions, however, and those with leadership responsibilities in these regards, is how to
adapt and update the regulations and guidance to reflect the changing nature of knowledge generation and representation.

SOME TECHNICAL AND DESIGN ISSUES

There are some technical issues in the transition from paper-based to digital submission of theses that require brief discussion. Over 100 years of the printed doctoral thesis (see Borg & Boyd Davis, 2012) has established detailed conventions for submission from institution to institution. Some of these look outdated, for example, ‘Theses must be presented in a permanent and legible form in typescript or print except that mathematical or similar formulae may be inserted neatly by hand. Photographic and other illustrations should be permanently mounted on A4 size paper and bound within the thesis. In no circumstances should “Sellotape” or similar materials be used for any purpose’ and ‘Any material which cannot be bound in with the text must be placed in a pocket inside or attached to the back cover or in a rigid container similar in format to the bound thesis.’ Furthermore, illustrative material may be submitted in the following forms: ‘a) audio recording [on] compact cassette tape C60 or C90, b) photographic slides [should be] 35 mm in 2 inch by 2 inch frame.’

No such detailed instructions exist for digital formatting and presentation but they could include something like the following: ‘digital submissions must be in a format that allows weblinks, and links to other modes like sound and (moving) image. Three-dimensional phenomena, like sculpture, installations and performance, must be rendered in two-dimensional form. The submission must give access to the examiners and all subsequent readers the full experience of the proposed thesis. It should be accompanied by a printed version which indicates where, and how material that cannot be included in print form, can be accessed’.

In terms of the actual submission of the thesis, candidates must often wait upon the decision of the examiners who will be asked by the Research Degrees Examination Officer whether they would prefer to read a hard copy or an electronic copy. ‘If the examiners request hard copies, you can choose to submit your thesis for examination in one of two ways, either softbound in medium blue cloth or spiral bound with clear plastic covers’. Again, there is no detailed specification for the electronic submission, other than ‘in pdf format’. This requirement appears to assume that the material submitted will be static and renderable in the pdf format — as if
the digital version were simply an electronic version of the written, printed submission.

STORAGE AND DISSEMINATION

The regulations, quoted above, stipulate that the portfolio of submitted work must be ‘documented or recorded … by means appropriate for the purposes of … eventual deposit in the library.’ In many cases, in a reverse of the conventional procedure for the submission of a doctoral thesis for examination, the digital copy is usually accompanied by a hard copy for backup purposes. Universities which subscribe to the EthOS national thesis service of the British Library (and students of those universities) can access these digital copies of the thesis — via the full text where possible. Currently there are about 300,000 records of theses from over 120 institutions, with about a third available in full text. Of the remaining 200,000, three-quarters are available to be scanned. Each month about 3,000 new records are added and about two-thirds of these now provide the full texts of the theses. Access is determined by the host institution and may depend on mandatory electronic deposit of new theses, availability of the theses in the institution’s own repository and to what extent digitization of print theses is prioritized locally. Doctoral students and others are over 100 times more likely to access doctoral theses via this portal than via conventional means.

Such digital storage and accessibility means that dissemination is partly on demand. Titles and abstracts are available, as well as full texts — though the abstract is often embedded in the thesis — but so far there is no systematic and extensive provision of, say, 10—20-page summaries of theses written for lay or academic audiences that will give a substantial insight into the research that has been undertaken. The closest we have come to such a service is via agencies and research units which provide summaries for different audiences or the Research Impact summaries that universities have provided for the Research Excellence Framework — which do not tend to cover doctoral theses. What this gap suggests is that doctoral students themselves might wish, in future, to provide 10—20 page summaries for their respondents and for interested stakeholders. The public engagement agenda is important here, and projects like Catalyst operate at the interface of research scholarship and public interest.

Most university libraries now house e-repositories for digitized data, e-journals, e-books, digitized course readings and doctoral (and sometimes
Masters) theses and dissertations (e.g. http://eprints.ioe.ac.uk). Furthermore, making a digital version of the thesis available enables the metadata to be ‘harvested’ by search engines worldwide, for example, via DART-Europe, the European research libraries e-thesis portal (see www.dart-europe.eu). The online catalogue at my own university library, for example, has ambitions for a ‘discovery layer’ to give access to all of this material. Such a ‘layer’ would map thematic routes through the material to enable easier access for research students, keying in more to their needs. The key is that digital materials not only enable worldwide access but also enable better access by users with disabilities and/or learning differences.

**HOW DO THESE CHANGES AFFECT KNOWLEDGE PRODUCTION AND USE?**

There are at least three aspects of knowledge production and use that are raised by the move to digital/multi-modal theses. One concern is what kinds of knowledge are generated in doctoral work, another is whether research knowledge is upstream or downstream of application and third is the extent to which the users of knowledge influence (or should influence) the creation and design of the knowledge that is generated.

It could be said that if research operates without an accessible abstract or summary, it often remains unread — as was the case with pre-EthOS and pre-digitization. If the researcher, on embarking on a doctoral course of study, knows that his or her work will be read and that the available resources include all the modes of communication, the project and the knowledge generated will be different.

Each of the modes of communication has its own affordances. Verbal language, whether spoken or written, has the possibilities of abstraction, generalization (nouns themselves are thought to be generalizations), logical sequencing, hierarchical categorization. The still image has the affordances of direct, potentially visceral communication, whether in photographic or painted (digital) form. Words are still the mode via which search engines operate, whereas images (including signs and icons) are increasingly used to represent ideas. Each of these modes may sit in a dominant position to the other: we can imagine an illustrated book on the one hand, where the written word is primary and the illustrations secondary or, on the other hand, a series of photographs where the written word is secondary, as in captions.
Both of these major modes of communication are framed differently. Verbal, written and printed language abides by the medium which carries it: the page and the page on the screen. Currently I am working, in the United Kingdom, on an A4 page on computer screen. Because this is (academic) prose, the words wrap around at the end of the line unless I press ‘Enter’ for a new line or paragraph. The size of the page changes if the text is moved into a book (very few books are A4 in size) where the framing — as manifested in the words and in the design of the pages in the book as a whole — generates expectations as to the content.

The still image is always more consciously and more evidently framed, even if (or especially if) it is a cropped photograph. The inclusion and placing of a photograph in a thesis says something different from the adjacent written text. It represents a kind of knowledge that is direct, non-sequential, more sensory, observational, of a particular moment. Knowledge that comes in written form, especially academic writing, is almost by definition abstract, generalized, logical or quasi-logical propositional.

The combination of these two modes brings together these two sets of affordances: mostly in complementary fashion, sometimes in tension.

It is the nature of written academic prose in the doctoral thesis that it tends to operate downstream of innovation; in other words, it is post hoc. Its abstract nature allows it to reflect back on practice or phenomena, seeking to understand them by the identification of pattern. Once the pattern is identified and transformed into a theory and/or model, it can be applied for future practice and phenomena. But because of the downstream nature of the academic doctoral thesis, many of them remain unread and unused. How can advanced research of this kind be brought more upstream of practice and policy? Part of the answer lies in research teams, some of whom are engaged in post hoc analysis, and others who are applying that knowledge to the design of new products and new ways of doing things — and thus creating new communities of knowledge.

One further specific implication or unforeseen consequence of the move to the digital is obviating of the need for transcription of oral data into writing.

THE END OF TRANSCRIPTION?

While, on the one hand, there has been interesting and valuable discussion in multi-modal circles of the nature of transcription (seeing as one example
of transduction from one mode to another), the practice of transcribing from oral recorded data into written transcript must become an increasingly rare activity for researchers. First, the oral data are almost always recorded digitally. They can be stored in sound files. They can be incorporated into the main body of a thesis and/or into its appendices; even in the now outmoded practice of collecting ancillary data on a CD-Rom which is appended to the thesis, sound files can be recorded, stored digitally and presented as part of the thesis as a whole. Transcription is labour-intensive and probably takes up time that could be better spent by the researchers in designing research and collecting or analysing data.

Transcribing one or two interviews, for example, is always useful. The very act of transcription — the transduction from one mode to another — makes one look at the data carefully, seeking patterns that may or may not be replicated in subsequent interviews. The inclusion of a full transcript in an appendix — particularly if translation from one language to another is involved — provides evidence of the nature of the interview and of transcription conventions that have been used. But if the research involves moderate or large numbers of interviews or if the data takes the form of sound (e.g. recordings of naturally occurring sound phenomena) then it makes sense not to transcribe all the data but to let it ‘speak for itself’.

The suggestion that transcription may not be necessary is a simple, radical idea that may generate opposition. But it is worth asking: why is transcription necessary? Is the expense in time and/or money worth it? Could the research be presented more engagingly by providing direct access to the sound files themselves? The abstraction — literally — the pulling away from the core, original data that are involved in transcription create a distance between the reader and the data: one which may be conventional and enjoyed in academia but which may be a practice that is increasingly vestigial. As long as the analytical function is carried out, which involves standing back from the data so that patterns can be identified, the data itself can be presented more directly. The data can be re-represented in different modes if such an action makes them clearer to the author, and to the reader, where the patterns exist and what form they take.

It is understandable that some researchers may object to the idea that transcription of every digital sound recording may not be necessary. They will argue that analysis must be based on the written transcript, but the argument in the present chapter is that there is more to be gained in presentation of the original data, in the mode in which it was generated (and accessible if needed) accompanied by succinct analysis of its significance, than in the laboursome practice of transcription.
NEW COMMUNITIES OF KNOWLEDGE

Crowdsourcing is one form of collection and generation of knowledge that may well have further impact on the doctoral thesis. By making the thesis publicly available in digested, summary and full forms, it can be reviewed, commented upon, answered and be generally open to discussion in a way that was not possible 10 years ago. Although initially used by companies and other organizations to garner collective wisdom, crowdsourcing can be used as a research tool to generate and refine knowledge on a particular topic. Wikipedia is one result of such crowdsourcing, but it can be used more interactively to continue a dialogue about newly created knowledge.

The principle behind such interactive approaches to the generation of knowledge is dialogism, indicating a move away from one authoritative voice to a more collective creation of new knowledge. Such a move has implications for the doctoral thesis. As a genre and a rite of passage, the doctoral thesis tends to be an individualistic project in arts, humanities and social sciences. It will remain so as the qualification must be awarded to an individual. More team-based research — for example, involvement in a systematic review of research and/or a research project that involves a range of different types of engagement and outcome — will give scope for an individual dimension of the group activity to be separated for research degree purposes, as is often the case in the sciences. As expressed elsewhere in this chapter, such doctoral degrees can be factored into the design of research projects at the bidding stage and have to be managed carefully by both student and supervisor(s) to make sure that the outcomes are successful for all concerned.

One further aspect of new communities of knowledge is the facility for summaries of doctoral theses to be accessed by mobile technologies in a variety of media. It is not beyond imagination to conceive of digests of research findings that can be used by practitioners at the point of need: such is already the case in medical and health care; it could be the same in social care, education and other fields where practice needs to be informed by research. Research thus becomes upstream of practice.

PUBLIC ENGAGEMENT

The impact and public engagement agenda is largely concerned with grant-holding higher education institutions, and more specifically through an
initiative via Research Councils UK. A number of universities across the United Kingdom — Aberdeen, Bath, Exeter, the Institute of Education, Nottingham, Queen Mary, Sheffield — have been awarded catalyst funding to strengthen the commitment to public engagement, integrate public engagement into core research activity, support researchers at all levels within their institutions to engage and create networks within institutions to support and develop good practice in public engagement. See http://www.rcuk.ac.uk/per/Pages/catalysts.

To what extent is this movement towards impact and engagement relevant to and feasible for doctoral researchers?

Public engagement generally can take different forms. The approach at my own institution is set out at http://www.ioe.ac.uk/research/86369.html where sharing ideas, forming research partnerships, following good practice and learning about engagement are four dimensions of the work that is being undertaken to forge a better relationship between research and its use.

Research briefings of two pages in length (longer than an abstract and more user-focused) are another way in which engagement and impact can be fostered. As part of a whole series at http://www.ioe.ac.uk/research/87680.html, two examples are (a) a briefing on a study of the evidence available for teaching English as an additional language (EAL) in classrooms, and particularly at training for teachers in the field, which draws mostly on research published in the United States, Australia and the United Kingdom (http://www.ioe.ac.uk/Research_Expertise/RB18_Strategy_EAL_Andrews.pdf) and (b) on the experience of the United States in developing and implementing a National Writing Project for teachers to inform the establishment of a similar project in the United Kingdom (http://www.ioe.ac.uk/Research_Expertise/RB25_National_Writing_Project_Andrews.pdf).

Doctoral research, in arts, humanities and social sciences at least, has been largely individualistic and driven by curiosity of the researcher rather than by any larger social agenda. As noted above, team-based approaches to research which involve doctoral students are rare. As research project proposers include studentships within their work, however, the likelihood for a doctoral study to be aligned with a larger research project is becoming more common, and thus the possibility for stakeholder input at an early stage in the research design process — for example, setting the research question — is growing. The research impact agenda — seen most clearly in the requirement for the 2014 Research Excellence Framework to provide case studies of research that have had an impact on individuals, institutions or in other ways — is part of this wider picture of public engagement. Research impact tends to be seen as one-way; public engagement in
research is more reciprocal and cyclical in that such engagement can be included at the start of research projects, throughout their development, and again at the end of the project when dissemination and impact are considered.

CONCLUSION

I have argued in this chapter for a shift of practice in the way doctoral theses are conceived, supervised, developed and examined, in response to digitization and multi-modality and also in response to new practices in storage and dissemination. Such changes do not happen quickly in the university sector, but they can indicate changes in the way knowledge is generated.

In particular, the place of the doctoral thesis in the generation of new knowledge is put into question. If the doctoral thesis continues in its individualistic way in social sciences, arts and humanities, it is likely to be seen more as a *rite de passage* for the candidate rather than at the cutting edge of new knowledge. For a start, unless a doctoral candidate has undertaken a full systematic research review of the field in which he or she is working, there can be no guarantee that there is a genuine gap in knowledge being addressed or filled. By definition, individual researchers cannot undertake full systematic reviews because these require a team effort. It is thus the case — not often acknowledged — that the originality of the doctoral thesis is based more upon it not having been done in exactly this form before (its novelty) rather than on an original conception, design, dataset or conclusion.

Perhaps the degree of originality is a problematic concept itself? Even if an individual researcher, working as part of a research team, identifies his or her contribution as clearly separate from the work of the team as a whole, there are questions about the dividing line between the individual’s contribution and that of his/her part in the team.

My argument has been based on changes in the possibilities of new formats of submission and as such is limited to that perspective. Wider issues, like whether and if so, how the doctorate is used as a career stepping stone, about knowledge as generated outside the doctoral thesis and outside the academy and intellectual copyright issues that arise from the open and public availability of doctoral theses — are not addressed in this chapter. On the last issue, the more readily available nature of the doctoral thesis in its
digital form is generally seen by students who are studying, by the candidates themselves and by the wider academic community as a positive change in public dissemination and engagement. This degree of accessibility is important not only to fellow research students but also to users in wider communities in distilled forms like the one-page, two-page and 20-page summary (and other variations).

From the point of conception of a doctoral research project to the final points of dissemination, the affordances of new technologies, combined with an understanding of the multi-modal nature of composition, provide a challenge and opportunity to further research practice.

IMPLICATIONS FOR POLICY, EDUCATIONAL LEADERSHIP, MANAGEMENT

Finally, what are the implications for policy, educational leadership and management of the move towards the digital/multi-modal thesis? These are broad terms, so it is perhaps best to focus on the implications for doctoral schools and for innovative leadership in the field of research theses.

I would suggest the following:

There will be an increasing integration of research studentships into funded research projects so that early career researchers can respond to issues of public engagement and impact at the start of their research degrees. Early career researchers will learn how their own doctoral research fits into a larger picture of team-based research as well as into different communities of practice (including e-communities).

Highly desirable would be a move of research upstream so that it feeds into the practices and policies that flow from it rather than always addressing the matter ‘downstream’ or post facto/’after the case’. Such a move would make research more productive in that its results would feed into learning design rather than attempt to study learning after the event.

All of the above suggests that guidance for students, supervisors and examiners as to the possibilities afforded by the digital/multi-modal thesis will need to be reviewed and revised. While not being presented as templates for future research, a collection of exemplars of theses that have exploited the possibilities that the digital/multi-modal dimensions would be very useful for research students. These could be stored on the university intranets and/or in libraries. The libraries themselves may need to develop more secure (backup) institutional repositories for digital doctoral theses,
as well as national and international collections like EthOS and DART, so that hard copies are no longer necessary.

NOTES

1. Digitization and multi-modality are not synonymous, but the advent and wide use of digitization in the early 1990s coincided with the rise of interest in multi-modality, probably as a result of the birth of the Internet and the more widespread use of the computer screen.


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