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Digital Curation on a Small Island: A Study of Professional Education and Training Needs in Ireland

In this paper, we use case study method to understand digital curation knowledge, skills, needs and challenges in Ireland in order to direct the development of third level digital curation educational programmes. Data was collected in three intervals over a two year period: a web questionnaire about digital curation knowledge and skills and interest in continuing professional development (CPD); nine interviews with individuals who engaged in digital curation work about workplace challenges and CPD education; and a final online questionnaire about preferences for digital curation CPD education. Findings suggest that Ireland specific issues emerged: a) because there is so little understanding about digital curation in Ireland, even among information professionals, individuals were not always sure when they were doing digital curation work and if they needed to learn more and; b) individuals were often the only one in their institution with digital curation skills and found themselves struggling to educate supervisors and colleagues about the necessity of their work as well as the resources needed to conduct their work. Considering these findings, comprehensive postgraduate digital curation education in Ireland would need to include a focus on these issues.

Keywords: word; digital curation; CPD education, case study

Subject classification codes: include these here if the journal requires them

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Introduction

Digital preservation and curation became prevalent topics in the mid 1990s when libraries began to realise their role in making digital information resources available for the long term¹. Since the early 2000s, scholars have written about digital curation competencies and the best ways to teach digital curation and develop digital curation programmes for third level (also known as postgraduate) education. These studies

¹ Kim, "Growth and trends", 2014.

relied on interviews with experts, literature reviews, Delphi studies and analysis of job postings. However, such research seldom acknowledged environmental or cultural factors in identifying these competencies. Such contexts, to name a few, might include the current state of third level education with respect to digital skills, extant cultural resources (digital and otherwise) and institutions for managing them, legal and policy regimes regarding digitisation, and other local practices. In short, as with other educational practices, the teaching of digital curation is not culturally neutral.

Ireland (including the Republic of Ireland and Northern Ireland) is a case in point where local needs and practices have had a significant impact on the growth of digital curation as a discipline. A confluence of factors situates the recent history of professional education in Ireland: a recession with resultant public sector staffing and resource cuts (that have not fully recovered since the worst of the austerity-related cuts from 2008 to 2010), the inconsistent availability of broadband across the country that may make the delivery of online education difficult across Ireland, and rising fees at third level institutions that make education increasingly unaffordable.

Nevertheless, Ireland has seen a growth in the digital humanities and third level education for the past two decades.² However, there has been less attention paid to digital curation, digital stewardship and digital preservation skills; that will be needed to manage and maintain the digital humanities projects as well as other types of digital material in the public and private sectors. While scholars writing in the context of the United States, Canada, England and Australia can assume some general familiarity with digital curation in the information professions, this is not the case with Ireland.

We set out to understand digital curation knowledge and skills, challenges and potential for digital curation Continuing Professional Development (CPD) in Ireland

² Gourley and Viterbo, “A sustainable repository”, 2010

using case study method over a two-year period. Findings could then be used to inform the development of digital curation CPD education specifically suited for the Irish context. Succinctly, we set out to ask: what are the digital curation training needs for Ireland? How can those needs best be met by education that is reflective of and shaped by an understanding of Irish needs, practices, and culture with respect to professional and CPD education?

Literature Review

According to Beagrie, the term digital curation “was first used at the Digital Curation: digital archives, libraries and e-science seminar sponsored by the Digital Preservation Coalition and the British National Space Centre” in 2001.³ Succinctly, digital curation has been defined as “the management and preservation of digital material to ensure accessibility over the long term”.⁴ In 2007, Yakel suggested that digital curation was “becoming an umbrella term for digital preservation, data curation and digital asset and electronic records management”.⁵ In addition to being associated with the terms that Yakel suggested, digital curation has more recently been associated with the term “digital stewardship”. Digital stewardship has been defined as “the collection, selection, management, long-term preservation, and accessibility of digital assets” as well as “not limited to the creation, maintenance, preservation, dissemination, and exhibition of a trusted body of digital information for current and future use”.⁶ While each term varies slightly and the term “digital curation” has expanded in its scope and

³ Beagrie, “Digital curation”, 2006.

⁴ Abbott, “What is digital curation”, 2008.

⁵ Yakel, “Digital curation”, 2007.

⁶ Bastian et al. “From teacher to learner,” 2011; Choi et al. “Developing twenty-first,” 2014.

applications over time, they have in common concern about care and long-term maintenance of digital material.⁷

The digital curation literature of the last twenty years arguably comprises two major strands. One of these focuses on what might be called the technical components of digital curation: standards, tools, and processes.⁸ The second comprises a significant body of literature on education, training, and organisational dimensions of digital curation. In the United Kingdom, the Digital Curation Center's (DCC) vision for the work of digital curation and subsequent development of the lifecycle model have been foundational in bringing these strands together (and stimulating work in both).⁹ The lifecycle in particular has been useful to educators, working professionals, and others as a tool with which to strategise about curation policy and practice in different kinds of institutional settings, communicate the importance of digital curation to stakeholders, articulate the knowledge and practice base of curators and structure educational and continuing professional development offerings.¹⁰

With increased interest in digital curation education and funded projects in the early 2000s, much was written about requirements for digital curation, digital preservation and digital stewardship education. Lee, Tibbo and Shaffer (2007), gathered data via the DigCCurr Project about what digital curators need to know in order to develop a complex matrix of digital curation knowledge and competencies. According to Lee et al., the six dimensional matrix was "based on a review of existing literature and semi-structured interviews with members of our advisory board".¹¹ The

⁷ Dobreva & Duff, "The ever changing face", 2015.

⁸ Witt et al., "Constructing data curation profiles", 2009.

⁹ Rusbridge et al., "The digital curation centre", 2005; Higgins, "The DCC curation lifecycle", 2008.

¹⁰ Jones, "A report on the range", 2009; Pennock, "Digital Curation: A life-cycle", 2007; Knight & Pennock, "Data without meaning: Establishing," 2008; Higgins, "Digital Curation: the emergence", 2011.

¹¹ Lee et al., "Defining what digital curators", 2007, 489.

highest levels of the matrix suggested that competent digital curators should have developed knowledge and skills in type of resource; specific functions and skills [associated with digital curation], professional, disciplinary or institutional/organisational context; mandates, values and principles; prerequisite knowledge; and lifecycle stage [in reference to the DCC Curation Lifecycle Model]¹². Of most interest were the functions and skills, a list containing 27 items, ranging from administration to procedures associated with different actions of the Open Archival Information System Reference Model (OAIS).¹³ In summary, the matrix emphasised working with digital objects at all stages: from creation to the end of life.

In contrast to Lee et al. who used literature and interviews to construct digital curation competencies, Kim, Warta and Moen utilised job advertisements (mostly US based) to develop an understanding of what digital curators needed to know.¹⁴ The researchers analysed 173 job advertisements, focusing on position title, institution, degree, experience, knowledge/skills/abilities, and duties. The researchers found that in 2012, digital curation could still be considered an “evolving” field in North America. The competencies most desired by employers included communications and intrapersonal, curating and preserving content; curation technologies; environmental scanning; management, planning and evaluation; and services, systems, models and modelling.

According to Bastian et al., while emphasis in digital stewardship pedagogy should be focused on preservation, curation and stewardship activities, additional knowledge of the context and environment in which the asset was created should be understood.¹⁵ In addition, education should include an emphasis on how the assets would be used in the

¹² Lee et al., “Defining what digital curators”, 2007.

¹³ Ibid.

¹⁴ Kim et al., “Competencies required for”, 2013.

¹⁵ Bastian et al. “From teacher to learner,” 2011.

future, how users would expect them to perform and what infrastructure would be needed to support continued access. Drawing on a sample of relevant syllabi, the authors determined that core elements in the teaching of digital curation and stewardship included discussion of the OAIS Reference Model, multiple formats, processes and best practices in the field. They suggested that the history of digital archives, social and policy issues of concern, access issues and concerns, and organisational and management issues and user concerns should also be addressed in a digital stewardship course. While the authors preferred the use of the word “stewardship” to “curation” as they believed it would be more all encompassing, they noted significant overlap.

In their discussion of the digital stewardship curriculum at Catholic University of America, Choi et al. argued that a digital stewardship course should “strike a fine balance between technology, user needs and service, preservation and management”.¹⁶ Such a description echoed the work of Bastian et al., which suggested that not enough emphasis was placed on users and management in curricula.¹⁷ In addition, Choi et al. emphasised the role that cultural heritage institutions had in the process of digital stewardship, suggesting a target market of their programme.¹⁸ They emphasised the teaching of contextual foundation, resource management, digital curation, information organisation, information service and digital technology. In describing their introductory digital curation module, learning outcomes included the understanding of the digital curation lifecycle, online tools, environments, research skills and challenges of the field.

¹⁶ Choi et al. “Developing twenty-first,” 2014, 82.

¹⁷ Bastian et al. “From teacher to learner,” 2011.

¹⁸ Choi et al. “Developing twenty-first,” 2014, 82.

Turning to European efforts, Madrid conducted a Delphi study of 16 library, archive and museum (LAM) experts, mostly working in Europe.¹⁹ She found that experts reached consensus on 11 competencies for digital curators in the final round of the study. These competencies included

- Having a high level IT understanding to really understand the digital material and to identify risks;
- Ability to collaborate with international partners-on things related to digital curation;
- Ability to ensure the provenance of the preserved data;
- Ability to communicate with other information professionals, e.g. Computer scientists, IT specialists;
- Knowledge of information architecture;
- Ability to select and appraise digital documents for preservation;
- Ability to monitor the obsolescence and development of file formats, hardware and software;
- Understanding the context of creation of the digital objects;
- Understanding different preservation strategies;
- Knowledge of relevant digital curation standards, best practices, workflows; and
- Ability to know the user needs to define significant properties.²⁰

One of the most recent lists, Madrid's list of competencies included the opinions of mostly European-based experts.

¹⁹ Madrid, A study of digital, 2008.

²⁰ Ibid, 29-30.

In Ireland, digital curation as a profession has been slow to take hold, though some of the skills and competencies can be found in other programmes (such as digital humanities). This state has persisted in spite of the geographical proximity of the UK with the well-established work of the Digital Curation Centre, the Digital Preservation Coalition (DPC), and universities offering formal training in digital curation and preservation (University of Glasgow, University College London, Aberystwyth University, Robert Gordon University and Kings College London, among others).

With respect to the library profession in Ireland, there has been some interest in identifying CPD needs in general but not digital curation in particular. In 2009, Bury conducted an online survey and 41 in-depth interviews with members of the library profession in Ireland and found that CPD education was recognised as important to Irish information professionals, but the landscape was fragmented between different library organisations that accredit and offer education. Bury also noted that lack of funding and lack of time continued to be a problem and that many of her interviewees believed the issue limited their ability to engage in CPD educational offerings. Survey and interview data suggested interest in CPD education that addressed digital preservation and digital curation.²¹

The only existing data specifically centred on digital curation education in Ireland was collected as part of the Digital Curator Vocational Education Europe (DigCurV) study, a European Union funded project that aimed to establish a curriculum framework for vocational training in digital curation in Europe.²² While the 2013 European Union supported project was situated in the UK, it included data from a focus group held in Ireland. The report from this focus group suggested that Ireland, as well as the other focus group countries (Germany, Italy, Lithuania, and the UK) lacked

²¹ Bury, *Continuing professional development*, 2009.

²² Engelhardt et al., *Report and analysis of*, 2012.

properly trained staff in digital curation competencies as well as a lack of vocational training offerings. Focus group participants reported “IT skills and technical digital preservation skills” as the most pressing.²³

In the past two decades, digital curation has moved from concept to concrete educational offerings on several continents. However, introducing digital curation to Ireland where the term is still new could pose challenges for educational development in the field. In addition to the DigCurV study that found the need for digital curation skills in Ireland and Bury’s study that found that information professionals desired more CPD options in the area of digital curation, the Irish government formed the Digital Repository of Ireland in 2011, whose mission states that “the Digital Repository of Ireland is a trusted national infrastructure for the preservation, curation and dissemination of Ireland’s humanities, social sciences, and cultural heritage data” (www.dri.ie/about). It was officially launched in 2015. However, while such initiatives demonstrated an interest in digital curation in Ireland, including digital curation education, little is known about the specifics and if additional competencies exist specifically related to the Irish context.

Method

In order to understand digital curation needs in Ireland to advise the development of educational offerings, we used an exploratory case study method over the course of two years, with the case focusing on information professionals in Ireland (including the Republic of Ireland and Northern Ireland). According to Yin, the exploratory case study is best used to understand the “what” of a case and can include a variety of research methods, such as survey/questionnaire and interview.²⁴ Further, Yin suggested

²³ Ibid, 14.

²⁴ Yin, “*Case Study Research*, 2014.

that the essence of a case study is to illuminate a decision or set of decisions. In this specific case, the decisions included what competencies and knowledge were needed and how to best structure digital curation educational offerings in Ireland.

The term “information professionals” was loosely defined, with anyone self-identifying as an information professional being offered the opportunity to participate. We chose to conduct the case study over the course of two years to understand if digital curation needs evolved over the two-year period. The goal was to use these results to develop our postgraduate programme in digital curation (first offered in 2015) and to expand our programme offering to include an online Continuing Professional Development (CPD) certificate in 2018. In essence, we determined that gathering snapshots of data over the course of two years would provide insight into patterns in the sector in Ireland and inform us on how to move forward in developing the best education offerings in digital curation to meet the needs of information professionals in Ireland.

Based on our findings from the review of the literature and related educational programmes, we developed questionnaire and interview instruments to learn more about needs, interests, incentives, and barriers to digital curation training in Ireland. Beginning in 2015, we launched an initial online questionnaire that focused on content of digital curation and respondents’ knowledge of key skills. In 2016, we conducted interviews with those in the information sector to probe the results more deeply. Finally, in 2017, we conducted a short online questionnaire to assess preferences for the delivery of digital curation educational offerings (online, face to face, blended, short courses, etc.).

2015 Questionnaire

In order to learn more about digital curation needs and skills in Ireland, a 64-item online questionnaire was developed using Survey Monkey as the platform. The survey included multiple choice, Likert scales and open-ended questions and was developed after consulting existing literature. The questionnaire gathered data about common work tasks, participation in professional development activities, familiarity with digital curation knowledge and skills and participation in preservation activities. The questionnaire was piloted with a small group of information professionals outside of Ireland, as to not contaminate the subject pool. After the pilot, some language was revised and additional options were added in some multiple-choice questions.

The questionnaire was open for a two-month period in Autumn 2015.

Invitations were posted on social media accounts at the UCD School of Information and Communication Studies as well as an email sent to two listservs targeting information professionals in Ireland. After the questionnaire closed, data was analysed using Excel for Mac 14.7.2 with StatsPlus Pro to produce descriptive statistics.

2016 Interviews

In summer 2016, a research assistant conducted phone interviews with information professionals based in Ireland who had some experience with digital curation.

Participants were recruited by word of mouth using the snowball sampling method.

Interview protocol was developed from existing literature and preliminary results of the 2015 online questionnaire. Question prompts aimed to first assess participants' current understandings of digital curation and then assess needs associated with managing digital material.

2017 questionnaire

The 2017 10 item questionnaire was developed to gather specific data about preferences for digital curation education offerings in Ireland, specifically if those offerings were made available online. It consisted of multiple choice and free text answers. In addition to preferences associated with price of offering and method of delivery, participants were asked about their interest in digital curation education, likelihood to enrol in such a course and the specific topics they would most like to see covered in modules. After the questionnaire closed, data was analysed using Excel for Mac 14.7.2 with StatsPlus Pro to produce descriptive statistics.

Results

2015 Questionnaire

In total, 94 participants responded to the online questionnaire. Results were categorised as daily tasks, digital curation skills and knowledge and engagement in professional development. Most respondents reported holding an Irish NFQ level 9 (postgraduate degree) (91.57%) with most receiving their qualification over ten years ago (46.99%). Not surprisingly, the majority of respondents reported that they completed several tasks daily, such as writing emails (94.68%), working as a team (74.47%), liaising with other departments (30.85%), using Microsoft office applications (91.30%) and using databases (75%). One would expect this to be common among information professionals in a modern, technologically driven society. However, when asked about maintaining information tasks such as backing up one's own work, utilising cloud storage and running maintenance checks on storage systems, most respondents reported that this was managed by another unit. These results suggest that much of the work associated with maintaining personal digital material over time is not under the control

of the individuals, absolving them from the responsibility of practicing good data management practices.

Insert fig 1 here

Digital curation skills/knowledge

When asked about their skills and knowledge regarding digital curation, most respondents reported not being familiar with digital curation at all. When asked about their level of familiarity with The DCC Curation Lifecycle Model, one of the basic reference models used to guide digital curation practice, 40.45% reported not being familiar with the lifecycle at all (figure 2). Considering these results, it is not surprising that 67.42% responded that they never implement aspects of the DCC Curation Lifecycle Model. However, one cannot know if they are or are not implementing a lifecycle they know nothing about. The fact that respondents reported that they create material via their daily tasks, such as writing email and utilising Microsoft Office tools suggests that they are engaging in the “conceptualise” and “create or receive” phases of the DCC Curation Lifecycle Model.

Insert fig 2 here

Respondents were even less familiar with the Open Archival Information System (OAIS) Reference Model, another standard reference model for digital curation, 59.55% reported being unfamiliar with the model. In contrast, 51.76% of respondents reported being responsible for managing a digital collection. Thus, while over half

managed digital collections, over 60% had no familiarity with basic reference models used in digital curation.

These findings are interesting in the context of the growing interest in digital humanities in Ireland. Digital humanities projects often create digital content that needs to be managed over the long term, something that digital curation knowledge and skills are needed to complete.²⁵ A 2015 report stated that “Ireland is well poised to excel in this emerging field [digital humanities]... We have to act now to harness this opportunity. We need to build an infrastructure that supports practitioners and scholars of Digital Humanities”.²⁶ Considering the context, this finding suggests that Ireland’s information professionals are unprepared to manage increased data resulting from digital humanities projects.

Further, we asked about familiarity with interoperability protocols commonly used in digital libraries. Most Irish universities and some county council libraries host digital libraries. When asked about familiarity with the Open Archives Initiative Protocol for Metadata Harvesting (OAI-PMH) and the Open Archives Initiative Object Reuse and Exchange (OAI-ORE), 67.42% responded that they were not familiar at all with these protocols. These protocols are used to harvest metadata that can populate digital libraries. In contrast, 67.17% reported applying metadata to a collection on either a daily, monthly or weekly basis, with the most common response being on a monthly basis, at 20.22%. Further, 46.07% reported that they never ensured compliance or monitored the quality of the metadata they applied. These findings suggest that respondents did not understand the complexity of digital libraries and or systems in which they were applying metadata.

²⁵ Poole, “A greatly unexplored area”, 2017.

²⁶ Smeaton et al, Digital humanities-Ireland’s opportunity, 2014, 4.

When asked about compliance with legal, regulatory and governance frameworks related to digital items, most respondents reported some familiarity, with only 6.90% reporting that they were completely unfamiliar. When asked more specifically about copyright restrictions on digital research data, 74.71% reported some level of familiarity.

While they reported a lack of understanding on some issues, respondents recognised the value of digital curation skills. Of those involved in hiring staff (29 of the 94 respondents), 82.76% reported that they would hire an individual with digital curation qualifications if funds were available.

Engagement in professional development

Most respondents passively engaged in professional development, reporting that they read materials, websites and engaged with social media related to professional development regularly, with most reporting that they engaged in this behaviour from a few times a month to a few times a year (figure 3). Most respondents reported engaging in professional development activities in a combination of during working hours and outside of working hours (68.06%).

Insert fig 3 here

Fewer respondents reported active engagement in professional development events, such as organising or attending a workshop or conference or submitting authored work to a newsletter or journal. Most reported that they had never helped organise an event (41.86%), delivered a workshop or talk (51.16%) or contributed to professional development literature in written or online format (47.67%).

2016 interviews

In total, 9 individuals completed a 30-minute phone interview with the research assistant. Interview data was recorded, anonymised, transcribed and then coded using nVivo for Mac 10.2.2. Memoing and coding were used, via methods described by Corbin and Strauss.²⁷ Initial codes were developed from the interview protocol with more codes being developed during analysis. During the interviews, we focused on trying to capture participant's understandings of digital curation, which elements of their work included digital curation and their interest in and engagement with CPD.

Descriptions of digital curation

Of the nine participants interviewed, few were able to accurately describe digital curation in accordance with a formal definition, such as that offered by Abbot. Abbot defined digital curation as “the management and preservation of digital material to ensure accessibility over the long-term.”²⁸ Participant descriptions included some elements of Abbot's definition such as the word “preservation” but preservation was not linked with management or accessibility. Or management and preservation would be included, but accessibility was missing. In general, participant descriptions of digital curation were very narrow:

“it is the storage” (participant 3)

“sustainable preservation of work” (participant 1)

“collection distribution and making material available” (participant 8)

“management and preservation and digitisation of materials” (participant 9)

Following along with the mention of digitisation by participant 9, several participants described digital curation with a focus on digitisation, or the process of making analogue material digital, usually via a digital scanner:

²⁷ Corbin and Strauss, *Basics of Qualitative Research*, 2018.

²⁸ Abbott, “What is digital curation”, 2008.

“I presumed it means looking after archives of material that are digitised, put on a computer somewhere” (participant 7)

“Making either digitised collections available online with interpretation”
(participant 10)

Finally, some participants described digital curation as an environment or situation: “I would describe digital curation as creating an environment for discovery of digital artefacts” (participant 5) and “the care and collection of information about digital objects” (participant 6).

These definitions suggest that understandings of digital curation in Ireland are fragmented and incomplete. It is also alarming, but not surprising, that some participants limited digital curation to digitisation. While Yakel suggested that digital curation was becoming an umbrella term for preservation, curation and asset management, the conversion of an object from analogue format to a format that can be read by a computer is far from any of the accepted definitions of digital curation.²⁹

Work duties and challenges

When discussing work duties and challenges, participants voiced frustration over the need to manage large amounts of data, funding for data storage and misunderstandings with colleagues about best practices.

“The biggest digital asset for us is our database of 116,000 individual records”
(participant 4).

“We don’t pay for any kind of major online storage. Because we’re creating so much data, there’s an awful lot. We have a lot of external hard drives wandering around the office” (participant 3).

²⁹ Yakel, “Digital curation”, 2007.

“Trying to communicate between people who have some experience and knowledge and have no experience or knowledge, and in some cases, no interest—who would see it not as their job” (participant 6).

Managing large amounts of data and funding to store data are topics that would be commonly covered in a basic introduction to digital curation and were competencies found by Lee et al. and Kim et al.³⁰ However, participant 6 voiced an issue that might be somewhat unique to the Irish context. Both participant 6 and participant 10 discussed how they worked in organisations in which they were the lone digital information expert—the one charged with managing the data. Their institutional colleagues all had different backgrounds in digital humanities, computing or museum work, etc. When asked about their biggest challenge, they discussed trying to establish best practices when their colleagues have a completely different idea of what those best practices would be for management of digital objects:

“We’re going to be establishing an archive and records groups with the [institution] to try and tease out some of the issues that are continuously causing difficulty, but the reality is that you’ve got one [the participant’s role] and four or five [colleagues with the a different role] who all think the same way. It’s very difficult for me to see how that would be constructive, in that I suspect I’ll be overruled 99 percent of the time” (participant 10).

One participant noted that there were several competing ideas in their workplace as to what an object was, while another participant discussed how there were varying levels of interest in the necessity of recording accurate metadata. This was also an issue tied to funding, as senior officials who were seen as controlling the budgets, lacked understanding of the unique issues associated with maintaining digital data:

³⁰ Lee et al., “Defining what digital curators”, 2007; Kim et al., “Competencies required for”, 2013.

“I think a challenge is for there to be more understanding at the senior level of the resources and mistakes. I don’t necessarily mean the money. I mean in terms of the specialised staff and getting their engagement. I suppose the challenge would be the need for that central coordination, get those policies we need” (participant 6).

CPD and education

Most participants agreed that more options need to become available for digital curation continuing professional development in Ireland, but even if it was available, participants were not sure if they would have the time or funding to engage. This was particularly true for those who existed as the only information professional in their institution, or if they worked for a small institution with only a few staff members in total. When they were able to engage with CPD, it was most often narrowly focused on learning a specific skill, such as a new software or computer coding language. If they engaged in more general education related to digital curation, it was most often the free workshops offered by the DRI. As mentioned above, the DRI was only established in 2015 and therefore there was little free education about digital preservation available to these participants at all until recently; some participants graduated from their higher education programmes 10-30 years ago.

Participant 4 expressed their frustration at education, and the academics that teach it, that are too theoretical:

“Many of those people are coming from a technical, digital humanities background. There’s quite a lot of them and they’re speaking a different language. There are people who have been in the museum world for decades in a much more traditional sense. There’s a gap, certainly, across that divide.

That’s the network that needs to build. They need to start meeting and talking to

each other, being a bit less theoretical on the digital side and more practical, and what's realistic, and learning a lot on the traditional side, because one of the biggest issues for a lot of the traditionalists is if we actually did this with the resources we'd need to do it, it's an awful lot of money.”

This quote and questionnaire data strongly suggests that practical skills-based workshops are of greater interest to professionals than academic theory. However, the challenges discussed by the participants in communication, institutional organisation, project management and funding suggest that digital curation education that addresses the development of more “theoretical” skills such as the necessity for digital curation in society, may help practitioners understand and better communicate the necessity of digital curation to their supervisors and those controlling the budget.

2017 Questionnaire

CPD education

Lastly, we used our analysis of the workplace and needs data to collect information on a specific proposal for digital curation CPD education. In total, 164 participants responded to the questionnaire, at least in part.

Most respondents held positions in third level educational institutions (38.41%), followed by county councils (20.12%) (figure 4). The results from this final questionnaire confirm the on-going interest in developing digital curation skills and knowledge through CPD education: 92.68% of respondents stated that they would be interested in CPD education on the topic of digital stewardship, if it was to be offered in an online format. Of the 7.32% not interested, reasons stated for disinterest include time, funding and the fact that they did not know what digital stewardship was. This

confirms findings from the interviews, in which individuals were unable to describe digital curation and/or digital stewardship.

While interview participants discussed the lack of time and funding for face to face CPD, questionnaire respondents reported an interest in a hybrid model of education in which they engage in a combination of online education and face to face learning via intensive workshops lasting a few days.

When asked to rank topics of interest, most respondents reported being interested in developing skills and knowledge related to digital curation tools. The second most popular topic selected was research data management, followed by outreach, advocacy and marketing for digital projects and then an independent project in digital stewardship.

Discussion

Three sources of data were collected over a two-year period along the themes of digital curation knowledge and skills, work duties and challenges and CPD education. When considering the analysed data as a case study, several trends emerge that should be considered when developing digital curation educational offerings in the Irish context.

Digital curation knowledge and skills

Over the two-year period, knowledge of digital curation in Ireland did not appear to change, even with the establishment of the Digital Repository of Ireland and its free workshops and publications. However, individuals appear to be more interested in learning more. Many 2015 questionnaire participants were not aware of the DCC Curation Lifecycle Model or the OAIS Reference Model, interview participants were unable to describe most elements of digital curation and several 2017 questionnaire participants reported they were uninterested in digital stewardship CPD because they

did not know what it was. This data suggests that there is a consistent lack of understanding of digital curation and digital stewardship that does not appear to be changing even though most 2015 respondents and interview participants reported being involved with managing digital collections.

Considering these findings, it appears that any educational offerings developed would need to include the basics of digital curation so that individuals could understand definition of terms and characteristics of digital curation/digital stewardship work.

Digital curation challenges

Challenges did not necessarily change over time, but different methods of data collection allowed for the issue to be explored via triangulation. While 2015 questionnaire respondents reported a lack of knowledge to manage digital collections, results indicate a lack of understanding of some of the specific actions related to managing data over the long term, in the finding that 46.07% of respondents never ensured compliance or monitored the quality of metadata applied to digital collections. The interview data suggests that those responsible for managing digital data struggle with trying to educate supervisors and workplace colleagues about the tasks associated with managing digital data, as well as securing the resources needed to complete the tasks to a satisfactory level. In addition to outreach, this suggests a need for education about “inreach” and the ability to explain digital curation/stewardship in order to conduct day-to-day work effectively. This is especially necessary considering that many individuals with digital curation knowledge and skills will likely be unique in their workplaces until digital curation becomes better understood in Ireland. None of the reviewed literature specifically addressed this issue in developing education programmes, suggesting it might be unique to the Irish context and therefore could be unique to the Irish education experience for digital curation. While Lee et al.’s matrix

of knowledge and competencies included “advocacy and outreach” under functions and skills, outreach in the archives field is usually considered to be providing knowledge and services to users, not providing education to colleagues.³¹

Preferences for CPD education

Interest in digital curation CPD remained strong since it was first identified by Bury in 2009. All study data sources found that individuals were interested in CPD educational opportunities, but were hindered by lack of time and funding. This is not unique in the information profession or in Ireland. In their study of academic librarians’ CPD activities, Corcoran and McGuinness found that academic librarians were hindered by time and funding in their efforts to pursue CPD.³² However, our study finding that 92.68% of respondents were interested in *online* CDP education suggests that CPD education in this format could be the most successful, considering that asynchronous online education must not be completed at any time during a given timeframe. While asynchronous online CPD still requires a time investment, the fact that it can be completed at any time is a boon to working professionals who must organise class time around work commitments and cannot travel to attend face-to-face courses.

Interview data and 2017 questionnaire data suggest that participants would most like to see CPD educational offerings consist of practical skills. The interview data also suggests that this is the type of CPD training in which most participants engaged as it was offered in the format of free workshops hosted by DRI.

Digital curation in the Irish context

Several examples of previous literature exist on how to conduct research to understand digital curation competencies to inform the development of educational offerings. Lee

³¹ Lee et al., “Defining what digital curators”, 2007; Pearce-Moses, “Outreach”, 2005.

³² Corcoran and McGuinness, “Keeping ahead of the”, 2014.

et al. interviewed experts, Kim et al. conducted an analysis of job postings and Madrid conducted a Delphi study.³³ While all the researchers were able to identify skills and competencies necessary for digital curation work, none considered the context in which the education would be situated to be a component related to necessary competencies. Our research demonstrates that Ireland certainly has a need for digital curation, as many information professionals are tasked with managing and maintaining digital data over time. However, there is not yet a culture of digital curation in Ireland in which we can assume that most information professionals are familiar with the competencies, skills, knowledge and funding needed to complete digital curation work. England and Scotland have been educating digital curators for almost a decade and regularly one can find job postings for a digital/data curator/steward in online spaces. However, the proximity of England and Scotland have not led to a general understanding of digital curation in the Republic of Ireland or Northern Ireland. To make such an assumption would have the potential to hinder the effectiveness of digital curation education in Ireland, which we hoped to avoid with our research. While professionals who manage and maintain digital data in Ireland need to develop a general familiarity with digital curation and digital stewardship, advocacy, outreach and “inreach” must be an important part of digital curation education in Ireland due to current levels of understanding.

It is also important to consider in a context where digital curation is still considered new and not well understood, that many individuals may be the only person in their institutions with digital curation skills. This is where the skills of “inreach” and the ability to effectively teach colleagues and supervisors about digital curation is essential and should be part of any digital curation education programme in Ireland. While teaching can fall under the umbrella of outreach, specific attention should be paid

³³ Lee et al., “Defining what digital curators”, 2007; Kim et al., “Competencies required for”, 2013; Madrid, “A study of digital”, 2011.

to developing skills associated with communication and informal teaching opportunities. In addition, as many of the 2015 questionnaire respondents reported that other units such as information technology (IT) services departments manage digital data, it is necessary to develop the ability to effectively communicate with IT staff and differentiate between backup and storage versus stewardship and curation.

Finally, considering that in each data collection participants reported that lack of time limited their ability to engage with CPD, CPD offerings for Ireland should be developed with consideration of these time constraints. While universities often have requirements for a specific amount of “lecture time” per credit for all postgraduate and CPD courses, it appears from the data that CPD education would best be offered in an asynchronous, online delivery, allowing students to engage at any time of their choosing during the semester, while still meeting university requirements for “lecture” hours per semester. While this delivery format may work well for some topics such as introduction to basics and outreach, more advanced topics such as digital curation tools and research data management need face-to-face classroom time. Considering time constraints, efforts can be made to teach these topics in a condensed format that meets university requirements for lecture hours per semester while allowing students to complete all face to face classroom time over the course of a few days in a day-long workshop format, rather than meeting 2 hours every week for a 12 week teaching term.

Conclusion

In order to understand digital curation needs in Ireland to direct the development of educational offerings, we conducted a two-year case study, consisting of annual data collection at three intervals. We began by conducting a questionnaire of information professionals in 2015, in order to understand their daily work tasks associated with digital curation, digital curation knowledge and skill level and preferences for CPD

education. In 2016, we conducted nine interviews to further understand digital curation duties, challenges in the workplace and preferences for digital curation education.

Finally, in 2017, we conducted an online questionnaire to assess preferences related to digital curation CPD.

While the data is not generalisable, it does provide insight into digital curation in the Irish context. Some issues associated with digital curation work remained constant (lack of funding, lack of time for CPD), but the Irish context provided two unique findings. First, that the low level of familiarity with and understanding of digital curation and digital stewardship meant that many individuals who report managing and maintaining digital collections did so without a clear understanding of some of the most pressing issues associated with the work. Further, the lack of familiarity with digital curation meant that many individuals were or could be the only individual at their place of work with some understanding of digital curation knowledge and skills, meaning that they were tasked with educating colleagues and supervisors about the nature of their work and the resources needed to complete it. Considering these findings, it is necessary that digital curation education in Ireland provides knowledge and skills in outreach and advocacy, but also “inreach” (also known as internal outreach) and the ability to communicate effectively with management and other departments who influences their work, such as IT services.

This article also provides the authors with an opportunity to reflect on how local context is relevant in shaping educational, a theme that may be obvious to educational researchers but is not always surfaced in topics like professional and post-professional/CPD education. Informal conversations with colleagues in other countries that are similarly situated suggest they would find similar results: interest in professional and post professional education in digital curation but few resources to

follow through, combined with a “go it alone” approach built on self-study and informal conversations with colleagues (where possible) to steward digital materials.

With respect to next steps, the authors are continuing to do “consciousness-raising” around the need for the suite of skills we describe here by speaking at conferences, writing in Irish library-oriented publications, and networking with organisations like the Digital Repository of Ireland to provide opportunities for students.³⁴ Making our classes available to auditors from the professional community has also raised the profile of digital curation education. We also are exploiting the resources of Ireland’s closest neighbour with membership in the Digital Preservation Coalition and networking with colleagues at the Digital Curation Centre and universities to provide a wider variety of educational materials, networks, and placement opportunities for our students and staff.

Also, we continue to be “discipline agnostic” in our provision of digital curation skills, a strategic choice in a country with strong digital humanities training and programmes. Our own goal is to train graduates who can apply their training in cultural heritage institutions, universities, and the private sector.

Even as we keep abreast of new technologies for digital curation, we are also looking to other dimensions of the Irish (and European) legal and policy contexts to inform our training and networks to support our own learning. The requirement for data management plans in Irish Research Council funding proposals and for Horizon 2020 (a pan European research funding scheme) and the introduction of FAIR (Findable, Accessible, Interoperable, and Reusable) data principles for data sharing in European grants suggests to us that the training we provide in research data management will only

³⁴ Shankar & Cushing, “Creating an evidence-based”, 2016.

become more and more important.³⁵ We also continue to keep abreast of developments in data protection and privacy law in Europe and implications for digital curation; here, we look to larger organisations like DCC and DPC for resources. Lastly, increased interest and awareness of “open science” (including at the October 2017 Irish launch of the next work programme for Horizon 2020) is raising interest in more coordinated action around digital information management for research and innovation purposes.

As we go forward in building and growing our own evidence-based training programmes, we encourage colleagues in other comparable situations to survey the landscape in a similar fashion and adapt to their local context accordingly.

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³⁵ Wilkinson et al., “The FAIR Guiding Principles”, 2016.

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