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Digital Curation Education at the Universities of Ibadan and Liverpool: Benchmarking Using the DigCurV Curriculum Framework

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Abstract

This article presents the findings of the Ibadan/Liverpool Digital Curation Curriculum Review Project, conducted to formally benchmark the teaching of digital curation in the archival education programmes at the University of Liverpool, United Kingdom and the University of Ibadan, Nigeria. It provides background to the history and establishment of both universities and the development of their archives curricula. A matrix was developed using the DigCurV Curriculum Framework to assess whether digital curation skills and knowledge outlined in the framework are being taught, practised and tested in the Master's programmes. These skills and knowledge were assessed according to the four domains outlined in DigCurV: Knowledge and Intellectual Abilities (KIA), Personal Qualities (PQ), Professional Conduct (PC), and Management and Quality Assurance (MQA), to levels appropriate to practitioners and managers. The exercise identified skill and knowledge areas where teaching materials could be shared between the universities, and areas where new materials are needed.

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Introduction

This article sets out the findings of the Ibadan/Liverpool Digital Curation Curriculum Review Project conducted between November 2016 and July 2017 with support from the Fund for the International Development of Archives (FIDA) in line with the broad aims of the International Council on Archives' Africa Programme to support archival education.¹ The project was a collaboration between the University of Ibadan, Nigeria, and the University of Liverpool, United Kingdom, led by co-principal investigators Abiola Abioye and James Lowry, with research assistance from Rosemary Lynch. The two partner universities have well-established archival education programmes (their evolution is described in the two following sections) and both incorporate some level of digital curation teaching. The purpose of the Ibadan/Liverpool Project was to formally benchmark that teaching with a view to:

- understanding how the programmes compared with international good practice as articulated in digital curation curriculum frameworks
- identifying weaknesses in both programmes, to inform the revision of curricula
- identifying areas where teaching materials (module handbooks, lecture notes, reading lists, exercises and assessments) could be usefully shared between the universities
- identifying areas where new teaching materials were needed.

The project began with a review of existing guidance and frameworks for digital curation curricula and descriptions of digital curation skill sets and competencies. This review identified only one model that suited the objectives of the project as outlined above: the DigCurV Curriculum Framework. The Framework was published in 2013 as the major output of the Digital Curator Vocational (DigCurV) Education Europe Project, funded by the European Commission. It is described in detail below, in the section called *Assessing the Digital Curation Curricula at the Universities of Ibadan and Liverpool*. The DigCurV Framework was used to benchmark the content of both programmes. This article provides the results of that benchmarking exercise, as well as a set of **ancillary** results derived from the informal conversations that took place between the project team and various subject matter experts during the course of the formal benchmarking. The results informed a set of recommendations to both universities and the ICA's Africa Programme Steering Committee, which is involved with a number of activities relevant to digital curation teaching and curriculum review. A summary of the recommendations is provided in the conclusion to this paper.

Background to the Ibadan Programme

The University of Ibadan was established in 1948 as a College of the University of London. It became a full-fledged autonomous university in 1962. At its inception, the University ran academic programmes in Arts, Science and Medicine. Today, the

¹ For information about the International Council on Archives' Africa Programme, including its Strategy and Work Plan, see <https://www.ica.org/en/our-professional-programme/africa-programme>

University has 13 faculties comprising Arts, Science, Basic Medical Sciences, Clinical Sciences, Agriculture and Forestry, the Social Sciences, Education, Veterinary Medicine, Pharmacy, Technology, Law, Public Health and Dentistry. In addition, there are institutes and centres, which are autonomous academic units. The establishment of the University of Ibadan Library and Information Science (LIS) School in 1959 was informed by the need to satisfy the demand for the formal training of librarians in Nigeria. Hitherto, the earliest formal training in librarianship for the entire West Africa region consisted of short courses taught by practising librarians to prepare participants for the British Library Association examinations (Ojo-Igbinoba, 1995). The impetus for the establishment of the LIS School in Ibadan was provided by the West African Library Association (WALA) when it solicited the financial assistance of Carnegie Corporation of New York to develop its headquarters. This request prompted the commissioning of Harold Lancour to study the library situation in West Africa, with a view to advising on the intervention strategy required for its development (Abioye, 2014). The Lancour Report described the local training needs and recommended the establishment of a library school at the then University College, Ibadan (Ojo-Igbinoba, 1995). This led to the establishment of the Institute of Librarianship in 1959 with an initial grant of \$88,000 from the Carnegie Corporation. The Institute's first batch of six students was admitted in 1960. It was domiciled in the University Library until 1965, when an increase in the number of staff and students resulted in space constraints that necessitated its re-location to the Faculty of Education. Since then, it has been domiciled in the Faculty of Education even though discussion is currently ongoing on a proposal to transform it, together with related departments and academic units in the University, into a faculty.

The Institute of Librarianship ran and awarded the Postgraduate Diploma in Librarianship (PGDL) from 1960 to 1970. This academic programme was for graduates of other disciplines wishing to take up a career in the field of librarianship. In 1971, the Institute transformed into the Department of Library Studies. The PGDL programme was scrapped and replaced with the Master in Library Studies degree programme, which continues to run today, but with an enhanced curriculum appropriate to the title of Master in Library and Information Studies degree. In 1986, the Bachelor of Library Studies (now Bachelor of Library and Information Studies) degree programme was introduced. In addition, the Diploma in Library Studies programme was introduced although it is now run on the Distance Learning platform of the University. It should be noted that the Bachelor of Library and Information Studies degree programme also runs concurrently on the same platform for persons who cannot afford to be on full-time study. The name of the Department was also changed in 1986 to the Department of Library, Archival and Information Studies by which it is known today, to clearly mirror the full range of disciplines covered in its programmes.

By 1985, the Master in Archival Studies degree programme was introduced. The introduction of the programme was informed by the urge to meet the staffing needs of government ministries, departments and agencies, as well as the private sector in archives administration and records management. Besides, the National Archives, which had the tradition of training its archivists abroad in countries like Britain, Germany, Canada, India and Ghana (where the UNESCO assisted regional training centre in archival work was based) was finding overseas training increasingly difficult due to economic recession and foreign exchange problems. As such, it had to look inwards and open up discussion with the Department for the professional training of its staff. Indeed, the National Archives was instrumental in the take off of the programme, which it supported with a pledge of an annual subvention for a period of five years to stabilise it,

and a crop of experienced archivists to serve as part-time lecturers on the programme. It is also interesting to note that the staff of the National Archives formed the bulk of the first set of students on the programme. The curriculum for the programme has been reviewed from time to time to reflect developments in the field and it was the last review exercise that changed its nomenclature to Master in Archives, Records and Information Management degree.

The programme in its present form consists of course work spread across three semesters as well as industrial training for a period of six weeks in an archival or related establishment to acquire practical experience. The core courses, according to the departmental prospectus for master degree programmes, include the following courses.

The course, 'Archives Administration' with ARM 701 as the course code, focuses on the concept of archives and the various activities involved in acquisition, processing, housing and making archives accessible to users. Records and Information Management (ARM 702) deals with the whole gamut of records and information management, adopting the life cycle and continuum model, taking into consideration the hybrid system operated in Nigeria. The course 'Preservation and Conservation of Library and Archival Materials' (ARM 703) focuses on the techniques for preservation of information resources (irrespective of the format) including reformatting and disaster control management, taking into consideration the peculiarities of African environment. Archival Description (ARM 704) takes students through the basic principles of and standardization in the description of archival holdings through the preparation of finding aids. The course 'Element of Law for Archivists and Records Managers' (ARM 705) introduces students to legal provisions governing archives administration and records management, particularly the provisions in archival legislations, access rules, freedom of information law and concept of evidence and proof. The course 'Use of Archives' (ARM 706) deals with the principles and policy of access to archival holdings and reference service procedure. Oral Archives and Indigenous Knowledge System (ARM 707) underscores the importance of oral archives and indigenous knowledge in Africa and focuses specifically on the procedure for collection and preservation of oral archives. Foundation of Information Studies (LIS 701) introduces students to the evolution and development of libraries, archives and information centres, particularly in Nigeria, as well as modern trends in the information field. Management of Special Types of Archives (ARM 711) as a course exposes students to special types of archives and their organisation and management. The course 'Administrative History of Nigeria' (ARM 712) focuses particularly on the British colonial administration and its documentary system, as well as the documentary systems of other bodies in Nigeria (public and private) since independence. Automation in Archives and Records Management (ARM 713) focuses on the principles and practice of computing and the application of automation to archival work. Finally, the course 'Document and Data Management' (ARM 715) deals with the principles of document management, enabling technologies as well as costs and benefits.

Admission into the Master in Archives, Records and Information Management of the University of Ibadan is open to graduates of the University, or other universities recognised by the Senate of the University who possess a Bachelor's degree in Library, Archival and Information Studies, or any other discipline with a minimum of second class (lower). Experienced archivists and records managers with lower or fewer academic qualifications but with more than ten years practicing experience, particularly those sponsored by recognised institutions, may also be considered for admission.

The Department runs a doctoral degree programme with four areas of specialisation, namely Library and Information Science, Archives and Records

Management, Preservation and Conservation and Publishing and Copyright Studies. Through the programme, the Department has been producing faculty for most of the other LIS schools in Nigeria.

Background to the Liverpool Programme

At the end of the nineteenth century, there was a considerable demand for higher education in Liverpool. The city's University College developed out of an assortment of other educational establishments in the city and was granted a charter on 18 October 1881. For over a decade, it was part of the federated Victoria University together with other colleges across the North West of England, although during the 1890s there was a growing demand for an independent university in the city. The University of Liverpool received a charter on 15 July 1903, and formally separated from Victoria University later that year. A series of newspaper articles by Ramsay Muir, Assistant Lecturer in the School of History, had been influential in moulding public opinion in Liverpool in favour of this independent university (Kelly, 1981).

The energetic Muir also had a keen interest in stimulating research into local history and had, by 1902, established the School of Local History and Palaeography, later the School of Local History and Records. From 1908, the school was headed by J.A. Twemlow, Lecturer in Palaeography and Diplomatics, and aimed to facilitate 'the study, editing and publication of the history and records, mediaeval and modern, of the City of Liverpool and adjoining counties' (University of Liverpool, 1953).

In 1947, Geoffrey Barraclough, Professor of Medieval History, established the Archive Diploma in the Study of Records and Administration of Archives (Shepherd, 2009). The impetus for the creation of the course, came partly from concerns over the widespread destruction of records in Britain during the Second World War and the subsequent need to preserve them in a systematic manner. This led to the establishment of local government records offices, and a need for professionals to staff the offices. By the mid-1960s, more records were being deposited in record offices, larger business firms were starting to realise the usefulness of systematic and professional record-keeping and the Diploma came to be seen as an essential qualification for employers looking to appoint archivists. Over the next few decades, the course continued to grow, most years attracting many more applicants than there were places.

Although it had offered a Masters programme since 1983, the University restructured the course into a modular credit based programme in 1996, as the Masters of Archives and Records Management (MARM). This offered more pathways to international and part-time students, and required a 12,000-15,000 word dissertation, encouraging students to engage with the wider archives and records management research community. In 1999, the Liverpool University Centre for Archive Studies (LUCAS) was set up as a 'forum for the discussion and promotion of matters relating to archives and records management practice, research and education for both professionals and users' (Allan, 2003).

Admission to the MARM course requires a first degree in any discipline, with a UK classification of 2.1 or above, or the international equivalent. Traditionally, applicants have come from humanities backgrounds, particularly history, but this has been diversifying over the last ten years. Admission also requires awareness of the record-keeping profession, which is gauged through admissions interviews. Finally, admission requires some relevant work experience, gained by volunteering or through employment. This does not need to be specifically archival, and can include

employment that exposes applicants to the use or management of records, such as in clerical work. This requirement is in place so that students can draw on their practical experience in order to understand the principles and methods taught to them during the MARM course.

At present, MARM students take four compulsory modules over two terms: HIST577: Record-keeping Theory and Practice; HIST575: Record-keeping Systems and the Organisational Context; HIST579: English post-Medieval Records (Reading and Interpretation), including an introduction to palaeography and diplomatic; HIST578: Managing Services, Access and Preservation; and two out of three optional modules: HIST561: International Record-keeping; HIST540: Medieval Palaeography; HIST566: Digital Records: Their Nature, Use and Preservation in the Information Society.² Methods of assessment vary across the modules, but all MARM assessments are marked according to comprehensive generic criteria as well as the specific requirements of the assessments. The methods of assessment include essays, formal reports, blog posts, catalogues, condition reports (for preservation and conservation), presentations and training videos. On the completion of the teaching component of the course, students can choose to write a dissertation to complete the Masters degree, or be awarded the Diploma in Archives and Records Management. Post-graduate research in records and archives at the doctoral level is also available at Liverpool.

The MARM degree prepares students for work in record-keeping. The Archives and Records Association (ARA) accredits the course as a qualification for archivists, and the majority of graduates will be employed as archivists. Traditionally, most MARM graduates were employed in local records offices (the archives of local government bodies in the UK) and the MARM curriculum reflected the needs of that job market. There is still a high rate of employment in local records offices, which typically care for large volumes of early modern records, and this is one of the reasons that English post-medieval palaeography continues to be a mandatory subject. Other students will be employed as archivists in other sectors, including central government, and the private and third sectors, both in the UK and internationally. The job market for 'digital archivists' continues to grow. The ARA accreditation guidelines include digital knowledge and skills, and MARM graduates are currently considered qualified for employment as digital archivists. Other graduates will work as records managers, again in diverse organisations. Finally, a small proportion of graduates will work in related fields, such as information governance and compliance. As with applicants to the programme, the employment profile continues to diversify.

Assessing the Digital Curation Curricula at the Universities of Ibadan and Liverpool

Following informal discussions about the teaching of digital curation, the principal investigators on what would become the Ibadan / Liverpool Digital Curation Curriculum Review project explored existing articulations of digital curation skill sets. The project team decided on the DigCurV Curriculum Framework as a metric for assessing the curricula at Ibadan and Liverpool. This choice was based on the advice of the Digital Records Expert Group (DREG) of the International Council on Archives, and a review of the digital curation literature, which shows a wide acceptance of the

² Fuller descriptions of the modules are available at: <https://www.liverpool.ac.uk/study/postgraduate-taught/taught/archives-and-records-management-ma/module-details/>

framework as the leading statement of professional skills in this area (Verbakel and Grootveld, 2016; Mason and Halvarsson, 2017; Cushing and Shankar, 2018; Feng and Richards, 2018). The Framework was published in 2013, as the major output of the Digital Curator Vocational (DigCurV) Education Europe Project, funded by the European Commission.

The DigCurV Project anticipated that the Framework would ‘be used to guide the development and evaluation of training programmes, to support the benchmarking of existing courses, and in planning ongoing professional development’ (Molloy, 2013). The framework has been used in different ways, (Verbakel and Grootveld, 2016; Cushing and Shankar, 2018; Feng and Richards, 2018), but perhaps the most fully described application, prior to our work, was the training needs assessment at the Bodleian libraries (Mason and Halvarsson, 2017). Whereas Mason and Halvarsson were assessing staff skills gaps using interview questions derived from the framework, our project was concerned with assessing curricula, so we needed a different approach to data collection. What follows is a description of our interpretation of the Framework and development of a data collection tool.

The DigCurV documentation notes:

For successful professional performance, staff must demonstrate domain-specific and technical competencies, generic professional and project skills, and personal qualities in a blend appropriate to their particular professional context (Gow, Molloy and Konstantelos, n.d.).

The Framework addresses these specific, generic and personal competencies and qualities through various levels and lenses, as described below. In terms of professional contexts, the Framework is designed for the cultural heritage sector, but rarely makes reference to that sector, and is broadly applicable across sectors because the skills concern digital curation, professional and personal skills and qualities. Where the Framework references the cultural heritage sector, the Ibadan/Liverpool team treated the skill more generically.

The Framework identifies the need for different levels of skill or knowledge at different levels of digital curation practice.

Table 1. DigCurV Skills and Competency Levels³

Level	Description of competency	Denoted by
Basic	Maintains a basic awareness of a given subject area, including basic knowledge of the range of issues that shape developments in the subject area.	<i>Is aware of</i>
Intermediate	Able to demonstrate understanding of a given subject area, and possesses some knowledge of the terminology, business processes and tools relevant to the subject area.	<i>Understands</i>
Advanced	Possesses detailed knowledge of a given subject area, and is able to apply this knowledge to complete tasks on an independent basis.	<i>Is able to</i>

³ DigCurV Skills and Competency Levels: <http://www.digcurv.gla.ac.uk/skills.html>

The Framework also defines three ‘skills lenses’; one for Practitioners, who would be expected to ‘plan and execute a variety of technical tasks’, one for Managers, who would be expected to ‘plan and monitor execution of digital curation projects, to recruit and support project teams, and to liaise with a range of internal and external contacts within the cultural heritage sector’, and one for Executives, who would be expected to ‘maintain a strategic view of digital curation, to understand the emerging challenges in digital curation for the cultural heritage sector, and to make informed funding decisions to meet these challenges’ (DigCurV, n.d.). The ‘lenses’ are used to pinpoint appropriate skill levels at the various levels of practice. For example, a Practitioner may be expected to have an advanced level of competency in a given skill (be *able to* perform the task) when an Executive may only be expected to have a basic level of competency in the same skill (be *aware of*). The DigCurV project team noted:

We do not, however, expect an individual working within cultural heritage digital curation to possess every skill, ability or piece of knowledge described within the Framework. Rather, the Framework is an *aspirational* model, providing a range of competences and qualities to which individual professionals can aspire in their pursuit of professional excellence (Gow, Molloy and Konstantelos, 2014).

The Masters programmes offered by Ibadan and Liverpool are intended to prepare students for their first professional post; our project team, therefore, did not expect to see all of the skills or competency levels represented in the curricula. However, we hoped to see in both curricula evidence of teaching each skill to the level defined by the Framework as being appropriate to the Practitioner and/or Manager level of competency.

In addition to the skill levels and lenses, the Framework conceives of skills across four domains: Management and Quality Assurance (MQA); Knowledge and Intellectual Abilities (KIA); Professional Conduct (PC); and Personal Qualities (PQ). At Ibadan and Liverpool, skills across these categories are taught across modules/courses, so it was essential that we apply the Framework to the whole of the Masters programmes, rather than specific digital curation modules/courses. As discussed in the section below, this raised a question about mandatory and elective modules/courses: are all students exposed to the same opportunities for the development of skills and knowledge in digital curation? In other words, are the programmes achieving a baseline of digital curation skill and knowledge in all graduates? In applying the Framework, the team identified mandatory and elective programme components against the skill identifiers to help to answer these questions.

Each skill is given a unique identifier that ties it to its domain. Rosemary Lynch, of the Ibadan/Liverpool project team, developed a matrix using a spreadsheet with four worksheets, one for each skill domain (KIA, PQ, PC and MQA). Within each worksheet, the skills for that domain are listed in order of unique identifier, alongside a column for the University of Ibadan and a column for the University of Liverpool. Within these columns, three columns are provided to document the skill levels (is aware of, understands, is able to). For increased insight into the quality of digital curation teaching in the programmes, the project team inserted three rows under each skill to document whether a skill was taught (i.e. information delivered through tutor-student contact, which may be augmented by readings and group work), practiced (i.e. students are given the opportunity to practice the skill or apply the knowledge through in-class

exercises, group work, projects, etc) and tested (i.e. student ability is assessed and feedback is provided, whether or not the assessment is graded for course credit). This was thought appropriate because of the professional natures of the degrees: just as the admission requirements include academic performance and practical experience, so should the curriculum include opportunities for teaching, practice and assessment. During a two week working meeting in Liverpool in March 2017, the project team applied the matrix to the Ibadan and Liverpool curricula. This was achieved by an analysis of course/module documentation including syllabi, module handbooks, reading lists, lecture slides, lesson plans, exercise documentation and formal (graded) assessment requirements. To assess the 'taught' component, we reviewed syllabi, module handbooks, reading lists and lecture slides. To assess the 'practiced' component, we reviewed lecture slides and lesson plans for evidence of in-class activities, and we reviewed exercise documentation and formal assessment requirements. To assess the 'tested' component we reviewed the module handbooks for evidence of group work, projects, etc., where feedback to students would be expected, and we reviewed the formal assessment requirements of modules.

Analysis

The following analysis references the skills included in the DigCurV framework by their unique identifiers (i.e. KIA1.1). See the appendix to this article for a tabulated expression of these findings.

Regarding KIA1.1 'Subject-specific knowledge and definitions', the DigCurV model conceives of 'subject-specific' knowledge as baseline knowledge of digital curation, such as common terminology and concepts. Liverpool's coverage of this knowledge is extensive, while Ibadan is teaching this only to 'awareness' level, indicating that Liverpool's material covering terminology and concepts could be shared with Ibadan.

Across skill requirements KIA1.2 to KIA1.5, the skills are taught, practiced and tested in a variety of ways across the Liverpool programme. By the end of the programme, successful students understand and are able to articulate the relevance and need for digital curation as part of organisational record-keeping and within archives services (KIA1.2), the current and emerging subject landscape (trends, people, institutions) (KIA1.3), respective responsibilities for digital curation across institutions (KIA1.4), and scope the boundaries for digital curation at their institution. While the same skills are taught, practiced and tested across the Ibadan programme so that successful students will be able to understand and articulate them, the operating environment of the university and most employers of Ibadan graduates is such that digital curation is not yet critical. As such, the recommendation is that Ibadan frame the relevant teaching to cover both paper and digital records, in anticipation of the increased computerisation in Nigeria and in recognition of the advanced state of digital working in some sectors (notably banking and primary industry).

The fundamental digital curation principles, including lifecycles, (KIA1.6) are taught, practiced and tested in the Liverpool programme as part of the HIST566 module to the 'understands' level, which is the acceptable benchmark for Managers and Practitioners, so there is no recommendation for change. With no teaching of this skill requirement at Ibadan, it is recommended that the materials used in Liverpool's HIST566 module are shared for adaptation by Ibadan.

Understanding of the 'designated community' (KIA1.7) is taught at Liverpool at the 'understands' level, which is the benchmark for Managers and Practitioners. It is not

practiced or tested. It is not taught, practiced and tested, at Ibadan. The recommendation is that the two universities work together to adapt and extend the Liverpool material for use by both universities.

At Liverpool, 'Select appropriate technological solutions' (KIA1.8) is taught and practiced in the HIST566 module, but is not tested. There was uncertainty over whether students could be said to 'understand' or 'be able to', which is the Manager / Practitioner benchmark. This arose from the lack of testing for this skill requirement, and the potential crossover with KIA1.9 'Apply appropriate technological solutions', for which both institutions received the same results as KIA1.8. The recommendation is to revisit the question during a review of HIST566.

KIA1.10 'Develop a professional network for support' is taught and practiced across both programmes to the 'is able to' level, which is the benchmark for all levels. The research team agreed that there was no need for testing this skill requirement, so the recommendation is for no changes.

KIA1.11 'Digital curation tools (at high level)' is taught and practiced at Liverpool, largely in HIST566, to the 'understands' level, which exceeds the benchmark for Managers. It is not tested. KIA1.11 is not taught, practiced or tested at Ibadan. The recommendation is to revise HIST566 to ensure testing of knowledge of digital curation tools, before sharing the module materials with Ibadan for adaptation.

Liverpool students are taught, practice and tested on their knowledge of digital preservation standards (KIA1.12) to the 'understands' level, which is higher than the benchmark for Managers and Practitioners. They are not considered to be 'able to' where ability is framed as the ability to contribute to the development of standards, which the research team felt required relevant post-graduate work experience. Ibadan students are not exposed to digital preservation standards, so the recommendation is to share HIST566, noting that many international standards will be difficult to obtain at Ibadan due to the expense of purchasing from the International Standards Organisation and accessing standards through library subscriptions.

KIA1.13 'Digital curation and preservation terminology' is taught, practiced and tested at Liverpool to the extent that students are expected to be 'able to' use terminology appropriately. This is not taught at Ibadan and the recommendation is to share HIST566 as well as elements of HIST575 and HIST577.

Both universities cover KIA 1.14 'Scope of team responsibilities within institution' to the 'understands' level, which is the benchmark for Managers. No recommendation.

KIA 1.15 'information technology definitions and skills' is covered in both programmes through the inclusion of computer science classes. At Liverpool, this is taught at the awareness level, which is below the benchmark for Practitioners, who should 'understand'. It is not practiced or tested. KIA1.15 is taught, practiced and tested at Ibadan, also at the 'awareness' level. The recommendation is that both programmes review their provision of computer science with a view to increasing student understanding of definitions and skills, and that Liverpool looks to the Ibadan provision of practice and testing in this area to increase the practical aspects of digital engagement in its course.

KIA1.16 'Select and apply digital curation and preservation techniques', is adequately covered by Liverpool to the benchmark for Practitioners, 'is able to', largely in HIST566. As Ibadan is not teaching in this area, the recommendation is to share HIST566 with Ibadan for adaptation.

Liverpool and Ibadan both cover KIA1.17 'Scope of own role within institutional context' adequately; there was no recommendation.

The project team answered conservatively to KIA2.1 ‘Maximise benefits and long-term value of collections’ for both programmes because of a lack of clarity on the meaning of the skill statement, and both programmes therefore fell short of the Executive benchmark of ‘is able to’. As there is no benchmark in this skillset for Practitioners or Managers, which is the target skill level for Liverpool and Ibadan graduates, the project team did not seek to define the skill statement more clearly.

As both programmes taught, practiced and tested KIA2.2 ‘Articulate information- and records-management principles’ and KIA 2.3 ‘Articulate the benefits and long-term value of collections’ to the ‘is able to’ level, which is the benchmark for Managers and for Managers and Practitioners respectively, no recommendations were made.

At Liverpool, students are taught, practice and are tested on ‘contributing to institutional policies, including criteria for selection/appraisal’ (KIA2.4) to the ‘is able to level’, which is the benchmark for Executives and Managers. Ibadan similarly teaches, allows practice and tests, but stops at the ‘understands’ level, so it may be beneficial to share materials in this area.

Across the remainder of the KIA2 skills, both programmes performed well, meeting or exceeding benchmarks for Practitioners; no recommendations were needed.

Across the range of KIA3 skill requirements (Evaluation Studies), neither programme performed well. None of the skills were taught, practiced or tested to any level, with the exception of risk assessment teaching at Liverpool, which resulted in KIA3.1 being taught and practiced to the ‘understands’ level, which is below the Executive benchmark of ‘is able to’ and KIA3.7 being taught, practiced and tested to the ‘understands’ level, which is below the Practitioner benchmark of ‘is able to’. Additionally, Liverpool taught an ‘awareness’ of the need to ‘continuously monitor and evaluate digital curation technologies’ (KIA3.4), which is well below the Manager and Practitioner benchmark of ‘is able to’. The recommendation is that the institutions work together to develop teaching materials in the area of Evaluation Studies.

KIA4.1 ‘Information-seeking strategies, access technologies and user sharing behaviours’ is taught, practiced and tested at Liverpool to the Manager and Practitioner benchmark of ‘understands’, but it is not taught at Ibadan and the recommendation is to share Liverpool’s search and retrieval teaching materials.

Both institutions covered KIA4.2 ‘Support information access and sharing’ to the highest level, exceeding the Practitioner benchmark of ‘understands’. No recommendations were made.

As with KIA4.1, KIA4.3 revealed that Liverpool could usefully share information seeking teaching material with Ibadan, though the researchers observed that Ibadan’s teaching in the area of librarianship may also include content that could be brought into its archival degree.

Knowledge of and the ability to select metadata standards (KIA4.4 – 4.6) is taught and practiced to the appropriate level (4.4 ‘understands’ (benchmark for Practitioner, exceeding benchmark for Executive and Manager), 4.5 and 4.6 ‘is able to’, which is the benchmark for Managers and Practitioners (4.5) and Practitioners (4.6)) at Liverpool. These skill requirements are not covered at Ibadan and the recommendation is to share relevant materials from HIST566 and HIST577.

The relationship between appropriate controlled vocabularies and metadata standards (KIA4.7) is taught and practiced at Liverpool to the ‘is able to’ (apply knowledge) level, which exceeds the ‘understands’ benchmark for Managers and Practitioners. Again, this teaching material could be shared with Ibadan, which is not teaching in this area.

Liverpool fell short of Ibadan in the data skills area. Ibadan is covering data structures and types (KIA5.1) and database types and structures (5.3), teaching, practicing and testing at the ‘is aware of level’, which is the benchmark for Executives in the case of KIA5.1, falling short of the ‘understands’ level, which is the benchmark for Managers in the case of both skill requirements. The recommendation is that Ibadan share teaching materials in this area with Liverpool, and that both institutions look to develop the material further, together.

KIA5.2 ‘File types, applications and systems’ had very different coverage across the two institutions. Liverpool was teaching to an ‘understands’ level, which is the benchmark for Managers and exceeds the benchmark for Executives. It was not facilitating practice and was not testing. Ibadan was teaching, practicing and testing, but at a lower level (‘awareness’), which is the benchmark for Executives but short of the benchmark for Managers. It is recommended that the two universities work together to develop teaching in this area.

Neither institution was teaching the skill requirement KIA5.4 ‘Execute analysis of and forensic procedures in digital curation’. The recommendation is that the two institutions explore how to develop teaching in this area.

The ‘Integrity’ skill requirements are not taught, practiced or tested in the Ibadan programme, and are taught, practiced and tested to various extents in the Liverpool programme. The following analysis concerns Liverpool and the broad recommendation is that Liverpool’s teaching material could be shared with Ibadan.

At Liverpool, PQ1.1 ‘Responsibility, accountability and good practice in digital curation’ is taught to the ‘understands’ level, which is the benchmark for Executives, but stops short of the Managers and Practitioners benchmark of ‘is able to’. It is not practiced or tested. It is recommended that Liverpool reviews its teaching of this skill.

Regarding PQ1.2 ‘Value of policy formulation to deal with malpractice’, the Liverpool programme contains policy formulation and implementation across its modules and in relation to various areas of practice. Furthermore, teaching around organisational culture and change management deal with the malpractice component. This is taught, practiced and tested to a level equal to, or higher than, the benchmark for the Executive level. There are no benchmarks for Managers or Practitioners.

The PQ1.3 ‘Make transparent decisions’ skill requirement is taught to the ‘understands’ level, which with the benchmark for the Executive and Manager levels. The skill requirement is not practiced or tested.

Concerning PQ1.4 ‘Demonstrate leadership in high quality standards of work’, the researchers observed that neither programme had conceptualised teaching around ‘leadership’. This was identified as a subject for further discussion, particularly: what are the leadership expectations for new graduates in the archives and record-keeping field in our respective countries, and how can our programmes best encourage the development of leadership traits in students?

PQ1.5 ‘Identify malpractice’ The Liverpool programme taught and allowed students to practice identifying malpractice through exercises across a range of professional activities.

For skill requirements PQ2.1, 2.2, and 2.4 through 2.8, Liverpool was teaching, practicing and testing, or teaching and practicing to the ‘is able to’ level, meeting benchmarks for Executives, Managers and Practitioners. Much of this is covered in HIST575 and the recommendation is that Liverpool share HIST575 materials with Ibadan, which was not teaching in this area.

Both institutions were teaching, practicing and testing PQ2.3 ‘Articulate value of collections to peers, other staff and public’ to the ‘is able to’ level, which is the

benchmark for Executives and Managers, so there were no recommendations for this skill.

Neither institution was teaching PQ2.9 'Communication protocols for designated community', which has a Practitioner benchmark of 'Understands'. The recommendation is that the two institutions work together to develop teaching material for PQ2.9.

Skills PQ3.1-5 are taught at the levels appropriate to Executives, Managers or Practitioners, at Liverpool, through a combination of digital curation teaching in HIST566 and change management teaching in HIST575, but there are limited opportunities to practice the skills. These skills are not embedded in the Ibadan programme. The recommendation is that Liverpool review its teaching in this area to look for opportunities for project-based teaching and practice, and share the results with Ibadan.

Skills PQ3.6-8 are taught at Liverpool at well below the benchmarks for Managers and Practitioners, with no opportunity for practice. Again, the recommendation is for Liverpool to review teaching in this area and share its results with Ibadan, which is not teaching in this area.

Skill PQ3.9 is not taught at either Liverpool or Ibadan, and should be considered in the review recommended above.

Liverpool is teaching, practicing and testing PC1.1 'Legal frameworks in which digital curation is taking place' at the 'is able to' level, which is above the 'understands' benchmark for Executives, Managers and Practitioners. It is teaching and practicing at the 'is able to' level for PC1.2 'Domain policies and standards for management and preservation of digital objects', which is above the 'is aware of' benchmark for Executives and Managers and the 'understands' benchmark for practitioners. However, it is teaching PC1.3 'Contribute to national/international regulatory frameworks in which digital repositories operate' to the 'understands' level, which is below the benchmark for Executives. The research team felt that the 'is able to' benchmark was not attainable within the framework of a Masters degree, and given that both programmes aim to prepare students to the Manager or Practitioner levels, there was no recommendation for revision or development here. Ibadan is not teaching in this area of skill requirements, so the recommendation is that Liverpool material should be shared for adaptation.

PC2.1 'Institution's legal culpabilities in digital curation activity' is taught and practiced at Liverpool to the 'understands' level, which is the benchmark for Executives, Managers and Practitioners. Ibadan teaches about legal culpability in relation to hardcopy records, so the recommendation is that Ibadan revise its material on compliance to ensure students are aware of the issues in the digital environment.

Both universities are teaching, practicing and testing PC2.2 'Incorporate legal requirements into institutional policies' to the 'is able to' level and there is no further work needed in this area.

PC2.3 'Contribute to institutional regulatory framework in which digital repositories operate' and PC2.4 'Apply appropriate actions to curation workflow to ensure compliance with legal and policy frameworks and relevant standards' are adequately taught and practiced at Liverpool, at least to the benchmarks for Managers and Practitioners. Ibadan is not teaching these skills and the recommendation is for sharing in this area.

There was some discussion over the nature of PC2.5 'Select and apply validation techniques to detect policy infringement', particularly over whether 'validation' refers to quality control measures such as reviewing classification practices or to technical

measures such as automated integrity checks on digital records. The skill statement was finally interpreted broadly, covering the range of possible organisational, procedural and technical measures. Liverpool teaches to the ‘understands’ level, exceeding the benchmark for Managers, but falling short of the benchmark for Practitioners. There is also no practicing or testing. The recommendation is to look for practical ways to teach this at Liverpool, allowing students to practice the skill, helping to ensure that they are ‘able to’, and sharing relevant material with Ibadan for adaptation.

Ibadan does not cover PC3.1 ‘Social and ethical responsibility in digital curation’. Liverpool teaches and facilitates practice to the ‘understands’ benchmark for Executives, Managers and Practitioners, so the recommendation is for sharing in this area.

Liverpool students will have an awareness of PC3.2 ‘Energy consumption and carbon footprint of digital curation activity’, which is below the ‘understands’ benchmark for Executives, Managers and Practitioners. Ibadan does not cover this issue at all. It is recommended that the two universities work together to develop adequate teaching in this area.

Liverpool students are taught and practice PC3.3 ‘Embed principles of ethical conduct throughout institutional policies (including those affecting curation activity)’ to the ‘is able to’ level, which is the benchmark for Executives and Practitioners. However, this is largely in relation to representativeness in appraisal and description and principles of transparency and privacy in access policy and provision: as a result of this benchmarking exercise, the research team recognised a need to reflect further on how and where, in the programmes, ethical conduct is taught.

Both programmes teach and allow the practice of PC3.4 ‘Adhere to principles of ethical conduct’ to the ‘is able to’ level, which is the benchmark for Executives and Managers. The research team noted that this should also be identified as a benchmark for Practitioners. The Ibadan programme goes further than the Liverpool programme by testing students on ethical conduct, so the recommendation is that Ibadan shares its assessment methods for ethical conduct with Liverpool.

The researchers agreed that it is not practicable to teach PC3.5 ‘Evaluate and treat employees fairly’ in Masters programmes that are already struggling to accommodate all the technical content necessary to prepare students for work in archives and record-keeping. The researchers felt that, to the extent that fairness can be taught, it is adequately covered in the teaching of professional ethics (i.e. PC3.4).

Across the risk management skill requirements, Liverpool fell short of the ‘is able to’ benchmark for Executives and Managers in relation to succession planning (MQA1.1) and the Manager and Practitioner benchmark for assessing, analysing, monitoring and communicating risks (MQA1.4), and there is a need for some revision of teaching in these areas. Liverpool exceeded the benchmarks for the remaining two skill requirements in this area. As Ibadan is not teaching risk management, the recommendation is to share and adapt any of Liverpool’s resources that may be useful.

Aside from some basic coverage of audit and certification standards in the Liverpool programme, teaching about audit and certification is severely lacking in both programmes. A good deal of work will need to be done to bring both programmes up to the benchmark requirements, and the recommendation is that the two universities work together to develop teaching materials relating to audit and certification.

Again, in the area of resource management, both programmes need to do much more to prepare students. With the exception of project management (MQA3.18), where skill requirements in this category are taught at Liverpool, they are below the benchmark for Executives, Managers or Practitioners. Where skill requirements are covered in the Ibadan programme (MQA3.6 and MQA3.15), they are generally to the

relevant benchmark level, though instances of skill requirement coverage are fewer than in the Liverpool course. The recommendation is that the two universities work together to explore problem-based teaching of digital curation, with practical project management exercises that could increase student knowledge of core digital curation concepts and practices as well as more general, transferable skills in resource management.

Summary of Recommendations

There is a range of material developed for the Liverpool course that could be shared with Ibadan for adaptation, either because the knowledge and skills are not being taught at all, or because the teaching stops short of the benchmark set by the DigCurV framework. This material covers terminology and concepts, fundamental digital curation principles, selecting and applying appropriate digital curation and preservation techniques, understanding information-seeking behaviours and strategies (though Ibadan's librarianship programme is another source of teaching material for this), contributing to policy development, including appraisal and selection criteria, the integrity skill requirements, knowledge of metadata standards and their application, the relationship between controlled vocabularies and metadata standards, [social and ethical aspects of digital curation](#), [legal frameworks for digital curation](#), policies and standards for management and preservation of digital objects and aligning curation workflows with compliance requirements.

Some of the Liverpool material needs to be revised and expanded before being shared, for instance, to include a testing element in the coverage of digital curation tools, and more in-depth treatment of change management and risk management. Ideally, these revisions will find ways to facilitate problem-based learning in developing services for the designated community and selecting and applying validation techniques to detect policy infringements.

It is important that this material should be reviewed for relevance before being introduced into the Ibadan course: some of the content will need to be adapted to the circumstances. For example, teaching around international standards will need to be rethought for Ibadan, where it may not always be possible to obtain copies of the standards due to the expense of purchasing from the International Standards Organisation and accessing standards through library subscriptions.

Materials developed at Ibadan could usefully be shared with Liverpool in areas where it's teaching fell short. The review found that Ibadan's teaching in the data skills area, including data structures and types and database types and structures, was more advanced than Liverpool's. The Ibadan programme also goes further than the Liverpool programme by testing students on ethical conduct, so it's recommended that Ibadan shares its assessment methods for ethical conduct with Liverpool.

The review found areas where both programmes could be improved. There is a need for a revision to some aspects of Liverpool's HIST566 module, particularly in relation to the level to which skills and knowledge are taught, and whether testing should be devised for more of the skill requirements. Ibadan could review its material to ensure that teaching reflects the increasingly digital records that graduates will be working with, particularly in relation to 'Institution's legal culpabilities in digital curation activity'.

The study found that the two universities could usefully collaborate on the development of new material that covers file types, applications and systems in more detail, understanding 'designated communities' and 'Communication protocols for

designated community’, ‘Energy consumption and carbon footprint of digital curation activity’ audit and certification standards, Translate current digital curation knowledge into new services and tools. Neither university is teaching evaluation studies or digital forensics at appropriate levels, and the study found that the two universities could collaborate on new material around these subjects.

One of the most important findings of this review is that baseline knowledge of computer science is not being inculcated in students on the Liverpool and Ibadan courses. Both programmes need to work to increase student understanding of computing definitions and skills. Furthermore, the review found that Liverpool could learn from Ibadan in its provision of practice and testing in the practical aspects of digital technology use.

The review also uncovered a need to think about how both programmes prepare students for leadership, and lead to the question ‘what are the leadership expectations for new graduates in the archives and record-keeping field in our respective countries, and how can our programmes best encourage the development of leadership traits in students?’, as well as a need to reflect further on how and where, in the programmes, ethical conduct is taught.

The recommendation is that the two universities work together to explore problem-based teaching of digital curation, with practical project management exercises that could increase student knowledge of core digital curation concepts and practices as well as more general, transferable skills in resource management.

Conclusion

The project found that both universities have some materials that could usefully be shared, with varying degrees of adaptation. Liverpool could share some of its teaching resources about subject knowledge, policy and appraisal, various information skills, communication and advocacy, change management, regulatory frameworks and compliance and risk management. Ibadan could share some of its teaching resources about data skills, particularly data structures and types and database design and management, and information ethics. The partners have undertaken to share the relevant materials.

There are areas where both universities would benefit from further developing material they already have. For Liverpool, this concerns teaching about information technology and risk management, and for Ibadan, this concerns subject knowledge, information technology, information seeking behaviours (which could be brought in from its librarianship programme) and regulatory compliance (shifting from an analogue focus). There are also areas where both universities need to reflect further on teaching – selecting and applying technological solutions, and embedding ethical conduct in policy frameworks.

New materials are needed by both universities to cover:

- KIA3.1-3.7 - Evaluation studies
- KIA5.2 - File types, applications and systems
- KIA5.4 - Execute analysis of and forensic procedures in digital curation
- PQ2.9 - Communication protocols for designated community
- PQ3.9 - Translate current digital curation knowledge into new services and tools

- PC3.2 - Energy consumption and carbon footprint of digital curation activity
- MQA2.1-2.10 - Audit and certification
- MQA3.1-3.18 - Resource management

The project report to FIDA identified these areas of need, and this information may inform the focus of the ICA training programme that is now in development. Future collaborations between the two universities may also focus on these areas.

The use of the DigCurV Curriculum Framework was an effective metric for analysing the Liverpool and Ibadan courses. Discussions between the project team and subject experts throughout the course of the project often focused on the subject-specific skills and knowledge required of new graduates. The DigCurV Curriculum Framework deals with core skills such as appraisal and repository management, but the assessment of the programmes would have benefitted from more granularity in subject-specific skills and knowledge, in particular drilling down into KIA1.1 'Subject-specific knowledge and definitions' to identify and benchmark relevant technical knowledge. Although subject-specific skills are not described in the Framework, the process of reviewing the curricula against the Framework helped to identify skills and knowledge that are not covered in sufficient depth in either programme. These included digitisation, web and social media archiving, open data and civic technologies, blockchain, linked data, text encoding, and more general knowledge of information studies and computer science subjects.

The findings of this project are of particular relevance to the two universities involved, but the methodology, and in particular the data collection matrix, could be of value to other digital curation educators who wish to align their programmes with the knowledge and skill requirements of practice. Apart from identifying gaps in curricula, the matrix allows users to ensure that educational programmes are delivering at the right level of skill or knowledge for the level of practice or management expected of graduates. Finally, for the digital curation educator, the matrix encourages reflection about the alignment of teaching with assessment through the 'taught, practiced, tested' elements. The methodology and matrix may also be useful to practitioners who wish to audit their own skills and knowledge.

The Liverpool and Ibadan courses have continued to evolve since they were both established in the mid-20th century. It is clear from this benchmarking exercise that they will both need to continue to evolve in order to meet the skill and knowledge requirements of digital curation. The Ibadan / Liverpool Digital Curation Curriculum Review Project was a useful way for plotting the next steps in the course of that evolution.

















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Appendix

Table 2. Knowledge and Intellectual Abilities








KIA: Knowledge and Intellectual Abilities		University of Liverpool			University of Ibadan		
		Is aware of	Understands	Is able to	Is aware of	Understands	Is able to
KIA1	Subject Knowledge						
KIA1.1	Subject-specific knowledge and definitions	E	M P			M P	
	Taught						
	Practiced						
	Tested						
KIA1.2	Relevance of, and need for, digital curation activity within subject context	E M			E M		
	Taught						
	Practiced						
	Tested						
KIA1.3	Current and emerging subject landscape (trends, people, institutions)	E			E		
	Taught						
	Practiced						
	Tested						
KIA1.4	Respective responsibilities for digital curation across institution		E			E	
	Taught						
	Practiced						
	Tested						
KIA1.5	Scope the boundaries for digital curation at institution			E M			E M
	Taught						

KIA: Knowledge and Intellectual Abilities		University of Liverpool			University of Ibadan		
Identifier	Skill requirement	Is aware of	Understands	Is able to	Is aware of	Understands	Is able to
KIA1.6	Practiced	[Redacted]	M P	[Redacted]	[Redacted]	M P	[Redacted]
	Tested						
	Fundamental digital curation principles including lifecycles						
KIA1.7	Taught	[Redacted]	M P	[Redacted]	[Redacted]	M P	[Redacted]
	Practiced						
	Tested						
KIA1.8	Designated community	[Redacted]	M P	[Redacted]	[Redacted]	M P	[Redacted]
	Taught						
	Practiced						
KIA1.9	Tested	[Redacted]	M P	[Redacted]	[Redacted]	M P	[Redacted]
	Select appropriate technological solutions						
	Taught						
KIA1.10	Practiced	[Redacted]	P	[Redacted]	[Redacted]	P	[Redacted]
	Tested						
	Apply appropriate technological solutions						
KIA1.11	Taught	[Redacted]	E M P	[Redacted]	[Redacted]	E M P	[Redacted]
	Practiced						
	Tested						
KIA1.12	Develop a professional network for support	[Redacted]	M	[Redacted]	[Redacted]	M	[Redacted]
	Taught						
	Practiced						
KIA1.12	Tested	[Redacted]	M P	[Redacted]	[Redacted]	M P	[Redacted]
	Digital curation tools (at high level)						
	Taught						
KIA1.12	Practiced	[Redacted]	M P	[Redacted]	[Redacted]	M P	[Redacted]
	Tested						
	Digital preservation standards						
KIA1.12	Taught	[Redacted]	M P	[Redacted]	[Redacted]	M P	[Redacted]
	Practiced						
	Tested						

KIA: Knowledge and Intellectual Abilities		University of Liverpool			University of Ibadan		
Identifier	Skill requirement	Is aware of	Understands	Is able to	Is aware of	Understands	Is able to
	Practiced						
	Tested						
KIA1.13	Digital curation and preservation terminology		M P			M P	
	Taught						
	Practiced						
	Tested						
KIA1.14	Scope of team responsibilities within institution		M			M	
	Taught						
	Practiced						
	Tested						
KIA1.15	Information technology definitions and skills		P			P	
	Taught						
	Practiced						
	Tested						
KIA1.16	Select and apply digital curation and preservation techniques			P			P
	Taught						
	Practiced						
	Tested						
KIA1.17	Scope of own role within institutional context		E M P			E M P	
	Taught						
	Practiced						
	Tested						
KIA2	Selection/Appraisal						
KIA2.1	Maximise benefits and long-term value of collections			E			E
	Taught						
	Practiced						
	Tested						

KIA: Knowledge and Intellectual Abilities		University of Liverpool			University of Ibadan		
		Is aware of	Understands	Is able to	Is aware of	Understands	Is able to
KIA2.2	Articulate information- and records-management principles Taught Practiced Tested			M			M
KIA2.3	Articulate the benefits and long-term value of collections Taught Practiced Tested			M P			M P
KIA2.4	Contribute to institutional policies, including criteria for selection/appraisal Taught Practiced Tested			E M			E M
KIA2.5	Information- and records-management principles Taught Practiced Tested	P			P		
KIA2.6	Institutional policies, including criteria for selection/appraisal Taught Practiced Tested	P			P		
KIA2.7	Plan application of selection/appraisal criteria to collections Taught			P			P

KIA: Knowledge and Intellectual Abilities		University of Liverpool			University of Ibadan		
Identifier	Skill requirement	Is aware of	Understands	Is able to	Is aware of	Understands	Is able to
	Practiced						
	Tested						
KIA3	Evaluation Studies						
KIA3.1	Prioritise funding for curation activities based on the value of digital objects and the risks facing objects			E			E
	Taught						
	Practiced						
	Tested						
KIA3.2	Respond to findings from user studies constructively in future decision-making			E			E
	Taught						
	Practiced						
	Tested						
KIA3.3	Conduct user needs analysis		M	P		M	P
	Taught						
	Practiced						
	Tested						
KIA3.4	Continuously monitor and evaluate digital curation technologies			M P			M P
	Taught						
	Practiced						
	Tested						
KIA3.5	Monitor and assess needs of designated community			M			M
	Taught						
	Practiced						
	Tested						
KIA3.6	Conduct usability evaluation			P			P

KIA: Knowledge and Intellectual Abilities		University of Liverpool			University of Ibadan		
		Is aware of	Understands	Is able to	Is aware of	Understands	Is able to
	Taught Practiced Tested						
KIA3.7	Prioritise curation activities based on value of digital objects and the risks facing them			P			P
	Taught Practiced Tested						
KIA4	Information Skills						
KIA4.1	Information-seeking strategies, access technologies and user sharing behaviours		M P			M P	
	Taught Practiced Tested						
KIA4.2	Support information access and sharing		P			P	
	Taught Practiced Tested						
KIA4.3	Deploy appropriate information seeking strategies			P			P
	Taught Practiced Tested						
KIA4.4	Key metadata standards for sector/subject	E M	P		E M	P	
	Taught Practiced Tested						
KIA4.5	Select metadata standards			M P			M P
	Taught						








KIA: Knowledge and Intellectual Abilities		University of Liverpool			University of Ibadan		
		Is aware of	Understands	Is able to	Is aware of	Understands	Is able to
KIA4.6	Practiced						
	Tested						
	Apply metadata standards						
KIA4.7	Taught						
	Practiced						
	Tested						
KIA5.1	Relationship between appropriate controlled vocabularies and metadata standards	M P			M P		
	Taught						
	Practiced						
KIA5.2	Tested						
	Data Skills						
	Data structures and types	E	M		E	M	
KIA5.3	Taught						
	Practiced						
	Tested						
KIA5.4	File types, applications and systems	E	M		E	M	
	Database types and structures	M			M		
	Taught						
Practiced							
KIA5.4	Tested						
	Execute analysis of and forensic procedures in digital curation	M			M		
	Taught						
	Practiced						
	Tested						

Table 3. Personal Qualities

PQ: Personal Qualities		University of Liverpool			University of Ibadan		
Identifier	Skill requirement	Is aware of	Understands	Is able to	Is aware of	Understands	Is able to
PQ1	Integrity						
PQ1.1	Responsibility, accountability and good practice in digital curation		E	M P	E		M P
	Taught	[Redacted]					
	Practiced	[Redacted]					
	Tested	[Redacted]					
PQ1.2	Value of policy formulation to deal with malpractice		E		E		
	Taught	[Redacted]					
	Practiced	[Redacted]					
	Tested	[Redacted]					
PQ1.3	Make transparent decisions		E M		E M		
	Taught	[Redacted]					
	Practiced	[Redacted]					
	Tested	[Redacted]					
PQ1.4	Demonstrate leadership in high quality standards of work			E			E
	Taught	[Redacted]					
	Practiced	[Redacted]					
	Tested	[Redacted]					
PQ1.5	Identify malpractice			M P			M P
	Taught	[Redacted]					
	Practiced	[Redacted]					
	Tested	[Redacted]					
PQ2	Communication and Advocacy Skills						
PQ2.1	Communicate across domains, staff groups and with other relevant communities			E M P			E M P
	Taught	[Redacted]					
	Practiced	[Redacted]					
	Tested	[Redacted]					


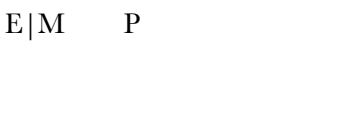






PQ: Personal Qualities		University of Liverpool			University of Ibadan		
Identifier	Skill requirement	Is aware of	Understands	Is able to	Is aware of	Understands	Is able to
PQ2.2	Articulate importance of digital curation to peers, other staff and public Taught Practiced Tested			E M P			E M P
PQ2.3	Articulate value of collections to peers, other staff and public Taught Practiced Tested			E M			E M
PQ2.4	Make case for funding of digital curation activity Taught Practiced Tested			E M			E M
PQ2.5	Manage and foster stakeholder relationships Taught Practiced Tested			E M			E M
PQ2.6	Plan and deliver dissemination activities Taught Practiced Tested			M			M
PQ2.7	Make case for staff training and development Taught Practiced Tested			M			M
PQ2.8	Engage with wider digital curation community			M P			M P











PQ: Personal Qualities		University of Liverpool			University of Ibadan		
Identifier	Skill requirement	Is aware of	Understands	Is able to	Is aware of	Understands	Is able to
	Taught Practiced Tested						
PQ2.9	Communication protocols for designated community		P			P	
	Taught Practiced Tested						
PQ3	Responsiveness to Change						
PQ3.1	Potential developments in business models, strategic planning and management models in digital curation	E			E		
	Taught Practiced Tested						
PQ3.2	Potential of developments in digital curation to influence new services and tools	E			E		
	Taught Practiced Tested						
PQ3.3	Emerging developments in discipline, and their applicability to digital curation activity in the institution		E			E	
	Taught Practiced Tested						
PQ3.4	Cultivate and maintain relationships with			E M P			E M P

PQ: Personal Qualities		University of Liverpool			University of Ibadan		
Identifier	Skill requirement	Is aware of	Understands	Is able to	Is aware of	Understands	Is able to
	other relevant sources of information in digital curation (individuals/services/institutions)						
	Taught						
	Practiced						
	Tested						
PQ3.5	Value of new and emerging digital curation technologies and processes		M			M	
	Taught						
	Practiced						
	Tested						
PQ3.6	Translate knowledge of technology and processes into services and tools for needs of designated community			M			M
	Taught						
	Practiced						
	Tested						
PQ3.7	Assess, extend and generate digital curation models for cultural heritage domain			M			M
	Taught						
	Practiced						
	Tested						
PQ3.8	Maintain continuous awareness of emerging developments in digital curation			P			P
	Taught						
	Practiced						

PQ: Personal Qualities		University of Liverpool			University of Ibadan		
Identifier	Skill requirement	Is aware of	Understands	Is able to	Is aware of	Understands	Is able to
PQ3.9	Translate current digital curation knowledge into new services and tools			P			P
	Taught						
	Practiced						
	Tested						

Table 4. Professional Conduct

PC: Professional Conduct		University of Liverpool			University of Ibadan		
Identifier	Skill requirement	Is aware of	Understands	Is able to	Is aware of	Understands	Is able to
PC1	Regulatory Requirements						
PC1.1	Legal frameworks in which digital curation is taking place		E M P			E M P	
	Taught						
	Practiced						
	Tested						
PC1.2	Domain policies and standards for management and preservation of digital objects	E M	P		E M	P	
	Taught						
	Practiced						
	Tested						
PC1.3	Contribute to national/international regulatory frameworks in which digital repositories operate			E			E
	Taught						
	Practiced						
	Tested						
PC2	Regulatory Compliance						

PC: Professional Conduct		University of Liverpool			University of Ibadan		
Identifier	Skill requirement	Is aware of	Understands	Is able to	Is aware of	Understands	Is able to
PC2.1	Institution's legal culpabilities in digital curation activity		E M P			E M P	
	Taught						
	Practiced						
	Tested						
PC2.2	Incorporate legal requirements into institutional policies			E			E
	Taught						
	Practiced						
	Tested						
PC2.3	Contribute to institutional regulatory framework in which digital repositories operate		M P	E		M P	E
	Taught						
	Practiced						
	Tested						
PC2.4	Apply appropriate actions to curation workflow to ensure compliance with legal and policy frameworks and relevant standards			M P			M P
	Taught						
	Practiced						
	Tested						
PC2.5	Select and apply validation techniques to detect policy infringement	M		P	M		P
	Taught						
	Practiced						
	Tested						
PC3	Ethics, Principles and Sustainability						
PC3.1	Social and ethical responsibility in		E M P			E M P	

PC: Professional Conduct		University of Liverpool			University of Ibadan		
Identifier	Skill requirement	Is aware of	Understands	Is able to	Is aware of	Understands	Is able to
	digital curation						
	Taught						
	Practiced						
	Tested						
PC3.2	Energy consumption and carbon footprint of digital curation activity		E M P			E M P	
	Taught						
	Practiced						
	Tested						
PC3.3	Embed principles of ethical conduct throughout institutional policies (including those affecting curation activity)			E P			E P
	Taught						
	Practiced						
	Tested						
PC3.4	Adhere to principles of ethical conduct			E M			E M
	Taught						
	Practiced						
	Tested						
PC3.5	Evaluate and treat employees fairly			M			M
	Taught						
	Practiced						
	Tested						

Table 5. Management and Quality Assurance









MQA: Management and Quality Assurance		University of Liverpool			University of Ibadan		
Identifier	Skill requirement	Is aware of	Understands	Is able to	Is aware of	Understands	Is able to
MQA1	Risk Management						
MQA1.1	Undertake			E M			E M

MQA: Management and Quality Assurance		University of Liverpool			University of Ibadan		
Identifier	Skill requirement	Is aware of	Understands	Is able to	Is aware of	Understands	Is able to
	succession planning						
	Taught						
	Practiced						
	Tested						
MQA1.2	Risk management theory and standards		E M			E M	
	Taught						
	Practiced						
	Tested						
MQA1.3	Apply risk management practice, techniques and standards to digital curation activities within institutional risk management context		M P			M P	
	Taught						
	Practiced						
	Tested						
MQA1.4	Assess, analyse, monitor and communicate risks			M P			M P
	Taught						
	Practiced						
	Tested						
MQA2	Audit and Certification						
MQA2.1	Audit and certification standards	E	M		E	M	
	Taught						
	Practiced						
	Tested						
MQA2.2	Benefits of audit process, and relevance of audit results	E			E		
	Taught						

MQA: Management and Quality Assurance		University of Liverpool			University of Ibadan		
Identifier	Skill requirement	Is aware of	Understands	Is able to	Is aware of	Understands	Is able to
	Practiced						
	Tested						
MQA2.3	Institutional liabilities in audit process		E			E	
	Taught						
	Practiced						
	Tested						
MQA2.4	Level of audit appropriate to institution		E			E	
	Taught						
	Practiced						
	Tested						
MQA2.5	Lead repository through certification process			M			M
	Taught						
	Practiced						
	Tested						
MQA2.6	Respond to audit report and build new service plan where required			M			M
	Taught						
	Practiced						
	Tested						
MQA2.7	Prepare effectively for an audit of curation functions			M			M
	Taught						
	Practiced						
	Tested						
MQA2.8	Audit of curation functions		P			P	
	Taught						
	Practiced						
	Tested						
MQA2.9	Certification of		P			P	

MQA: Management and Quality Assurance		University of Liverpool			University of Ibadan		
Identifier	Skill requirement	Is aware of	Understands	Is able to	Is aware of	Understands	Is able to
	repositories or programme						
	Taught						
	Practiced						
	Tested						
MQA2.10	Maintain documentation in preparation for audit process			P			P
	Taught						
	Practiced						
MQA3	Resource Management						
MQA3.1	Undertake strategic planning			E			E
	Taught						
	Practiced						
	Tested						
MQA3.2	Undertake business continuity management including disaster planning			E			E
	Taught						
	Practiced						
	Tested						
MQA3.3	Resources required for digital curation activity including energy consumption		E			E	
	Taught						
	Practiced						
	Tested						
MQA3.4	Reputation management		E			E	
	Taught						
	Practiced						
	Tested						
MQA3.5	Respond to staff recruitment,			E M			E M

MQA: Management and Quality Assurance		University of Liverpool			University of Ibadan		
Identifier	Skill requirement	Is aware of	Understands	Is able to	Is aware of	Understands	Is able to
	training and development needs						
	Taught						
	Practiced						
	Tested						
MQA3.6	Undertake financial planning, cost analysis and economic sustainability	E		M	E		M
	Taught						
	Practiced						
	Tested						
MQA3.7	Undertake business planning in line with corporate/institutional goals			E M			E M
	Taught						
	Practiced						
	Tested						
MQA3.8	Make sound decisions based on information produced by project team			M			M
	Taught						
	Practiced						
	Tested						
MQA3.9	Recruit and motivate staff			M			M
	Taught						
	Practiced						
	Tested						
MQA3.10	Create a team environment			M			M
	Taught						
	Practiced						
	Tested						
MQA3.11	Plan and implement sound			M			M

MQA: Management and Quality Assurance		University of Liverpool			University of Ibadan		
Identifier	Skill requirement	Is aware of	Understands	Is able to	Is aware of	Understands	Is able to
	staff training and development						
	Taught						
	Practiced						
	Tested						
MQA3.12	Make sustainable storage decisions in institutional context			M			M
	Taught						
	Practiced						
	Tested						
MQA3.13	Creation, management and monitoring of project plans		P	M		P	M
	Taught						
	Practiced						
	Tested						
MQA3.14	Undertake project management activities and innovative practices			M P			M P
	Taught						
	Practiced						
	Tested						
MQA3.15	Data management requirements		M P			M P	
	Taught						
	Practiced						
	Tested						
MQA3.16	Produce relevant information to support decision-making		P	M		P	M
	Taught						
	Practiced						
	Tested						
MQA3.17	Deal with data curation challenges			P			P

MQA: Management and Quality Assurance		University of Liverpool			University of Ibadan		
Identifier	Skill requirement	Is aware of	Understands	Is able to	Is aware of	Understands	Is able to
	through structured planning Taught Practiced Tested						
MQA3.18	Project management concepts and techniques Taught Practiced Tested		P			P	