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Health Information Literacy and Higher Education: The King's College London Approach

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Abstract:

Information literacy is a key issue in a knowledge-based society, particularly in health care. The Information Services and Systems department at King's College London is in a good position to improve health information literacy in two sectors: 60 % of its 5,000 staff and 17,000 students are in health-related academic disciplines, and it also serves thousands of healthcare staff including those who work in the two principal teaching hospitals associated with the College (Guy's & St Thomas' NHS Trust and King's College Hospital). ISS addresses information literacy in three ways: through training delivered as part of the taught undergraduate and postgraduate curriculum; through its iGrad programme aimed at postgraduate research students; and through its work with the Personnel department, developing staff knowledge and information competencies via the TrainIT suite of IT and information retrieval courses. This paper will review all three approaches and discuss future plans.

About King's College London:

King's College London is situated in the heart of London, with four main sites on both sides of the Thames. It has a long and proud history of commitment to "the advancement of knowledge, learning and understanding in the service of society" and recently celebrated its 175th anniversary.

King's has a strong research tradition and is among the top five universities in the UK in relation to research income. Management of King's intellectual assets, including the transfer of knowledge generated by King's researchers, is a major activity.

The College is also committed to excellence in teaching and has a diverse teaching programme for undergraduates and postgraduates which incorporates traditional teaching methods as well as new pedagogies associated with e-learning and distance learning.

King's is part of the University of London and is one of its largest Colleges with over 5,000 staff and 17,000 students. It has ten Schools, six of which are health related: Medicine, Nursing & Midwifery, Dentistry, Health & Life Sciences, Biomedical Sciences, and the Institute of Psychiatry.

Health Science students' studies are complemented by clinical placements in a number of hospitals in the South East, including the two principal teaching hospitals associated with the College: Guy's & St. Thomas' NHS Trust and King's College Hospital. The College has five library and information service centres on these hospital sites, serving all NHS employees as well as students and teaching staff.

Like all UK Higher Education Institutions, King's is welcoming an increasingly demanding and diverse student population to the College as a consequence of its widening participation programmes, and is embracing a growing number of overseas students through its distance-learning initiatives.

The information needs of staff and students at King's are catered for by the Information Services and Systems Directorate (ISS), one of the largest academic support departments. ISS is an integrated library, computing and information service with over 200 staff working in four main teams – Information Systems, Customer Services, Archives and Information Management and Corporate Services. Information literacy programmes for staff and students are primarily the responsibility of the Customer Services team, who provide classroom- and department-based instruction as well as online tutorials via the public access computer workstations provided across campus by ISS (some of which are available 24x7).

Information Literacy Drivers:

There are two main drivers for information literacy training in health sciences at King's. The first is the widespread recognition of the need for information and knowledge skills in order to succeed in a knowledge-based society. The second is the emergence of evidence-based practice in the health sciences.

Information Literacy in Higher Education

The UK Government made a commitment to ensure that the UK is a leader in the global information and knowledge economy, and one of the ways it is taking this forward is to encourage the widespread development of information and computer skills in the public and private sector and in the wider population.^{1,2} There has been considerable government

¹ IT for All. 1996

² Our Information Age. 1998

investment in information skills training for students, as well as for teachers and public and school librarians, and all education sectors are taking information literacy seriously as a result.

In Higher Education, the 1998 Dearing report identified the need for skills that students can use throughout their life in a knowledge-based society.³ One of the leading academic librarians in the UK, Sheila Corral, stressed the importance of both IT skills and information handling skills for higher education students.⁴ This led to SCONUL (the Society of College, National and University Libraries) developing a model called the Seven Pillars of Information Literacy, presented at IFLA in 2001 by Toby Bainton.⁵ These are:

1. The ability to recognize a need for information.
2. The ability to distinguish ways in which the information 'gap' may be addressed.
3. The ability to construct strategies for locating information.
4. The ability to locate and access information.
5. The ability to compare and evaluate information obtained from different sources.
6. The ability to organize, apply and communicate information to others in ways appropriate to the situation.
7. The ability to synthesize and build upon existing information, contributing to the creation of new knowledge.

These seven pillars not only address basic library and IT skills but provide for different levels of ability from novice to expert.

In 2004, most higher education institutions are providing information literacy training to the majority of their student population and many provide the same training for their staff. The major challenges in designing information literacy programmes are in assessment of outcomes; developing online modes of delivery; and ensuring that programmes meet the needs of a diverse user group - students now arrive at university with varying levels of IT and information literacy, depending on the nature of their home circumstances and studies. This will only intensify as more non-traditional students are welcomed into the College.

An additional driver for information literacy programmes in Higher Education is the relatively new set of requirements from the joint group of UK Research Councils for skills development among postgraduate research students. A programme called UK Grad has been established by all the Councils, and UK universities will need to demonstrate that they are meeting the wide range of skills specified by the Councils, including information literacy.⁶

Information Literacy in Health Care

Similarly, in the National Health Service, there was an early response to the Government imperative for an information-skilled workforce with the 1998 publication *Information for Health*.⁷ A separate training and development plan, *Working Together with Health Information: A*

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⁴ Dearing Report

⁵ Corral, Sheila

⁶ Bainton, Toby

⁷ LISU statistics

⁸ Information for Health, NHS Executive, 1998.

Partnership Strategy for Education, Training and Development, was also produced.⁸ Early NHS information skills training generally emphasized IT skills and there has been a massive programme to get all NHS staff trained to ECDL standards (European Computer Driving Licence) and to ensure that NHS information professionals also receive appropriate training and support.⁹

Recently, there has been a recognition that information literacy spans a wider skill set than computer skills, and newer education, training and development plans have emphasized information management skills as well. This approach to widening the information skills base of NHS staff has been reinforced by the workforce development strategy *Working Together, Learning Together*¹⁰ and by the programmes proposed by the new NHS University.¹¹

Another driver in health care has been “evidence-based practice” (EBP), a paradigm which emerged from work at McMaster University drawing together clinical epidemiology and problem-based learning to ensure that clinical decision-making is based on the best available evidence from research or practice.¹² The steps in EBP include:

- Define a problem with a structured question.
- Find information relevant to the problem.
- Appraise the relevance, reliability and quality of this information.
- Apply the results to the problem.
- Evaluate the outcome.

It was clear in the UK that if clinicians were to practice EBP, then their skills in finding, appraising and using information needed to be improved. “Critical Appraisal Skills” training programmes were established and NHS librarians added their own contribution with courses on information retrieval and management.¹³

Information Literacy at King’s College London

These drivers in Higher Education and in the NHS have had a major influence on how ISS delivers information literacy support to students, staff and NHS clients. Our interpretation of information literacy is very broad-based and follows the definition adopted in 1989 by the American Library Association:

⁹ *Working Together with Health Information: A Partnership Strategy for Education, Training and Development*. NHS Executive, 1999.

¹⁰ *Making Information Count: A Human Resources Strategy for Health Informatics Professionals*, Department of Health, 2002.

¹¹ *Working Together, Learning Together: A Framework for Lifelong Learning for the NHS*. London: Department of Health, 2001.

¹² NHSU website www.nhsu.nhs.uk

oth, Andrew and Brice, Anne. Eds. *Evidence Based Practice for Information Professionals...*

¹⁴ Palmer, Judy and Streatfield, David. *Good diagnosis for the 21st Century*. *Library Association Record*, 1995, 97(3): 153-4.

“Information literacy is an understanding and set of abilities enabling individuals to recognise when information is needed and have the capacity to locate, evaluate and use effectively the needed information.”¹⁴

We believe that all students need to develop skills for searching, evaluating and managing information if they are to be effective as students and as professionals in the health sector. Similarly, we believe that information literacy is an essential life skill for all staff working in our institution, enabling them to be effective in their jobs and as citizens.

Our information literacy programmes, like those of many other universities in the UK, follow the Seven Pillars model from SCOUNL described above. Information literacy is promoted in three ways:

- Taught modules are embedded in the undergraduate and postgraduate curriculum.
- A programme of information courses called “iGrad” is aimed at postgraduate research students.
- Staff are eligible to book online to attend a range of IT and related courses alongside a bespoke programme of on-demand departmental support. ISS is working with the Personnel department to ensure that this extensive portfolio of training opportunities is developed to support staff information and knowledge competencies.

1. Curriculum-based courses in information literacy

Information literacy training is delivered by information specialists in the Customer Services team in ISS as part of the taught course curricula. Each school has an assigned information specialist whose job is to understand the information needs of staff and students in that School and to liaise with other ISS departments to provide services which meet those needs.

The information literacy programme designed for the King’s College Medical School is described in detail in the box on the following pages and includes a description of the assessment methods used for this programme. Similar information literacy programmes are offered in other health science disciplines. For example:

- In Physiotherapy, first- and second-year training concentrates on key health sciences databases, and the training is linked to essay titles that students are required to do. A short session in the third year is linked specifically to clinical practice. Students use scenarios from their experiences on clinical placement to influence their searches.
- In Dentistry, database training occurs at the end of the first year and is specifically linked to an Oral Biology project required in the second year. Students choose a project title from a list of about 200 topics and are required to begin their searches over the summer vacation.
- In Nursing, the delivery of information literacy training is particularly problematic, owing to a massive yearly intake of 450 nursing, 50 midwifery and 800 post-registration students. This has necessitated a more creative and innovative approach to delivery, including more extensive collaboration with academic teaching staff. The information specialists for Nursing have created support

documentation to enable teaching staff to deliver their own sessions, and also to support online practicals with ISS. This not only widens the support base for delivery, but enhances the profile and visibility of information literacy.

All health sciences postgraduates on taught courses are additionally offered bespoke specialty-based information training which provides an overview of information retrieval, is oriented towards EBP approaches, and introduces a number of important ISS and external resources. This represents a significant undertaking as there are currently some 100 postgraduate courses within the portfolio. There is ongoing collaboration between the health sciences information specialists to ensure that best practice is shared.

A number of important factors have affected the content, nature and delivery of these information literacy modules over the past two years:

- Rising student numbers have necessitated a rethink on delivery options, with a move to online tutorials, and strategies for cascading responsibility for induction and basic training to a larger constituency of ISS staff.
- Overcrowded timetabling has made negotiation for a reasonable number of slots even more complex. Large group teaching has been jettisoned in favour of smaller groups, which in turn places pressure on the timetable.
- Early onset induction and information literacy training (aside from general introductions to the basic service) have proven to be least effective and have been realigned to coincide with curricular demand.
- Curricular relevance and appropriate timing of information literacy courses is achieved through extensive liaison with academic staff. A team of health sciences information specialists attend relevant curricular, course and education committees to ensure that information literacy receives a high profile in course content. This has proven particularly successful in the medical curriculum, where information skills are a formal element of course work.
- It has been essential to make information literacy training as relevant and interesting as possible in order to retain student interest. Teaching methods have moved on from the talk and demonstration approach to a more hands-on style and the practical element has been increased year-on-year. An online workbook/tutorial has been introduced to allow students to pace their learning.

An Example of One Health School's Information Literacy Programme

In Medicine, Information literacy training was introduced in the mid-1990s as part of a broader continuum of 'professional skills' teaching, incorporating numeracy and study skills. The training is distributed over five years as follows:

Year 1

- *The nature of biomedical information within the context of healthcare delivery*
- *Problems/solutions in finding and using this information*
- *Biomedical resource discovery on the Internet*
- *Basic Medline skills (hands on, using an online tutorial)*

Year 2

- *Medline refresher plus an overview of alternative resources to support Special Study Modules*
- *Evaluation of health resources on the Web (lecture, linked to an assessment, marked by academic staff)*
- *Evidence-based practice (very practical, less didactic approach in which students look for evidence to make clinical decisions related to a straightforward scenario, then report back - this is timed to coincide with their introduction to the principles of research methodology and clinical epidemiology).*

Years 3-5

- *Advanced Medline skills.*
- *On-demand sessions including: an information retrieval refresher session, EBP resources, web resources.*
- *The use of bibliographic management software including Reference Manager.*
- *Access to the staff training programme when there are vacancies.*

Assessment:

ISS has been particularly successful in establishing a compulsory information skills assessment for all medical students. Over the years different arrangements have been tried: multiple choice questions were quick to mark but prone to ambiguous answers, or to correct answers being changed at the last minute. Search skills assessments involving a Medline and Internet search were more demanding and more useful as academic exercises, but proved impractical in terms of the demands imposed on staff time.

The latest incarnation centres on the completion of an online information skills workbook. Medical students are required to complete a series of clinical and other skills during each academic year. When they have demonstrated competence in a particular skill, or have attended a demonstration, they are 'signed off'. In Year 1, information literacy is one of the logbook skills, and is signed off once the students have completed the Medline tutorial and the information skills workbook. The workbook covers the essential elements of the 'introduction to biomedical information' session, and can be delivered by more junior staff to ease the pressure on information specialists. The Medline tutorial consists of a step-by-step guide through two worked examples using a live Medline session, and can be used for self-study or for a face-to-face exercise. There are different versions of the tutorial: more advanced for medics, more basic for nursing.

*<http://www.kcl.ac.uk/depsta/iss/schools/bdhmn/medicine/infoskills/ws1.html>
<http://www.kcl.ac.uk/depsta/iss/schools/bdhmn/medicine/med/medline1.html>*

The workbook and tutorial exist as resources for everyone to use, but medical students are asked to complete a short form at the end of each, which submits their details to an email address. While this programme has worked very well in many respects, the disadvantage is that we no longer have a means of estimating how successful our teaching is. This is an area which may require further exploration.

2. iGrad Programmes

In the summer of 2003, ISS responded to a proposal by the Graduate School for Health Sciences to plan and deliver a pilot programme of Information Technology and Information Retrieval courses for postgraduate research students. The iGrad programme comprises three-hour introductory small group sessions where postgraduate research students are introduced to the principles of information literacy and its importance, not only as a transferable skill but also as a key research management skill. These sessions also cover the cycle of information literacy: from approaching the research project with a narrow knowledge base, through the construction of a systematic literature review, to the use of tools like Word, PowerPoint and bibliographic management software to enhance post-process research outputs. The sessions also include basic and advanced database searching beyond Medline, and statistical methods and packages.

The iGrad programme has raised two key issues. The first centres around how to establish consistent College-wide models for the assessment of training needs. The second and related issue concerns how to ensure that self-assessed competency ratings are not artificially inflated (a marked tendency in information literacy, where retrieval skills tend to be over-estimated by the student). To address both problems the College is working on a gap analysis for graduate skills. This work is being led by the Graduate School for Health Sciences.

Assessment of information literacy skills is still a problematic issue for UK higher education institutions which need to do more work in evaluating the development of transferable skills. The US and Australia are well ahead in this regard, having access to defined and detailed national standards for information literacy which support the teaching and assessment of these skills. This level of national recognition does not exist in the UK.

At King's, there is still a tendency to base assessment on the "happy" sheet approach: did you understand the course objectives, how well did the course meet its declared objectives, were the learning outcomes achieved, how well did it meet your personal needs? This trainee reaction approach is limited, and ISS recognizes the need to build on learning and behavioral change. Our intention is to conduct an observational cohort study that assesses students' skills on arrival, post-induction, and after a six-month period. We are also working with major players across the country (including University College London, Manchester and Edinburgh) to share best practice and to research the effectiveness of provision.

There are plans for a significant expansion of the iGrad portfolio to include: critical appraisal; journal club support; and the enhanced use of software tools to manipulate and enhance research outputs. The iGrad programme will also be extended to taught postgraduate courses which are increasingly research-based and populated by 'non-traditional' students.

The iGrad programme will play an important role in the College's Human Resources Strategy, forming part of a wider continuum of support for both postgraduate research students and research staff. The College has established an Advisory Group on Researcher Development to bring together key stakeholders in the College to plan the extended iGrad programme and to discuss how the College is addressing the Research Councils' requirements described earlier. It is developing a new induction programme and an appraisal/personal development plan (PDP)

process, and is undertaking a training needs analysis of the skills required by research students. Establishing PDPs for postgraduate research students will enhance the quality of their tenure at the College, and will articulate a well-supervised training programme that meets both their personal needs and the requirements of the College.

3. Staff Information and Knowledge Competencies

The third element of our information literacy strategy is short course information skills training provided under the “TrainIT” umbrella. The training is organized jointly by ISS and the Staff Development and Training Unit in Personnel, and covers a range of IT and information retrieval and management skills (such as basic and advanced bibliographic and full-text database search skills, internet searching, and the full range of MS Office applications). The TrainIT team also provide ECDL training for staff, and develop customized courses for specific groups within the College. Breakfast and twilight sessions are organized in order to suit staff working patterns, and staff may register for and evaluate courses online for greater convenience. Staff are generally given priority on these courses, but students are welcome to register whenever vacancies occur.

TrainIT has proved to be very popular with staff, so much so that students often have to wait a long time to get on courses. The TrainIT team is consequently exploring ways to manage the demand, including:

- Outsourcing and commissioning training both from within King’s and from outside.
- Collaboration with other King’s departments and with other Colleges in the University of London community.
- The creation of an ECDL test centre to facilitate remedial IT training.

While King’s has recognized the importance of information skills training for staff for some years now, these skills have not yet been built into a formal competency framework for the College. The College is now developing a Human Resources Strategy and, as part of this work, is examining core competencies to ensure greater consistency across the College in matching roles to skills requirements.

ISS is seeking to play a major role in this development for two key reasons. Firstly, ISS is leading on the development of an Information and Knowledge Strategy for the College, a key plank of which will be the creation of a knowledge-enabled workforce. Secondly, ISS will most likely deliver the majority of the information skills training, and we want to ensure that we contribute our expertise and knowledge to the definition of core information competencies. We have already been involved in national projects relating to information and knowledge competencies (such as the TFPL KM Skills Toolkit)¹⁵ and we hope to share our experience and knowledge with the Personnel department for the benefit of the College as a whole.

Conclusion

There are a number of challenges currently facing ISS in the development of information literacy programmes at King’s College London:

The sheer growth in student numbers generally, along with widening participation initiatives, are extending health sciences intakes, but often these students have a low level of IT skills and require remedial support. This will inevitably place a strain on face-to-face delivery, and training via virtual learning environments will need to be explored. However, we will need to ensure that online resources are educationally sound, and are not just a convenient way of dealing with large numbers of students without sufficient staff. This will require a close partnership with those in the College who lead on pedagogy. It will also require sustained investment to provide reliable and robust networks capable of supporting 24x7 access to these information literacy training resources.

Many health schools are re-modelling the curriculum to involve more online learning and to centre around clinical scenarios. This requires a review of information literacy programmes to ensure their continued relevance within the new structure e.g.

- Should introductory programmes continue to focus on large-scale biomedical databases like Medline, or should evidence-based practice resources such as the Cochrane Library and Clinical Evidence be given more emphasis?
- Should information management and bibliographic software training be included at any stage? While all students are provided with advice on reference styles and plagiarism, launching reference management software training would involve considerable time and effort.

It will also be important to review assessment methods to see if they are still appropriate and effective. Experiences so far have been mixed. Students who have failed and then repeated assessments have often learned a lot, but some have simply found it frustrating - another burden in an already busy curriculum. ISS hopes to create more sophisticated versions of the workbook and tutorial, delivered via a virtual learning environment and allowing the assessment element to be built in with automated checking of answers. The first stage will be a benchmarking exercise to identify best practice in other large-scale London institutions.

Working with those in the NHS responsible for information literacy is another much needed development. The NHS and HE sectors negotiate their licences to e-resources and e-journals separately. This means that our students access e-resources using one password and software and then have to use another password and software to access the same resources when they are working in the NHS. This has implications for information retrieval training and is confusing for students. A national NHS/HE Forum has been established and is proposing to fund a one-year project to develop an information literacy skills pathway for users of NHS and HE library and knowledge resources. This project will design and test a modular curriculum for information literacy skills, which in the longer term will be accredited as a national scheme and promoted as a cross-sectoral and multi-professional scheme for all students and staff in the healthcare sector.

In taking information literacy forward at King's, advocacy skills will be crucial to engage stakeholders and identify champions in the institution and in our partner NHS Trusts. ISS will ensure that information literacy as a transferable skill is incorporated into any personal development framework that the College wishes to pursue, and that the best practice initiated in medicine and health sciences is taken up across the College. Similarly, advocacy will be essential to ensure that our plans for a knowledge-enabled workforce are implemented as part of the College's Information and Knowledge Strategy and Human Resources Strategy. Finally, advocacy will be important to ensure that the information skills we develop in our health science students prepares them adequately and allows an easy transition to careers in the health service.

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¹ *Our Information Age: The Government's vision*. London: HMSO, 1998.

² *Our Competitive Future: Building the Knowledge Driven Economy*. London: HMSO, 1998.

³ National Committee of Inquiry into Higher Education. *Higher Education in the learning society: report*. London: the Committee, 1997.

⁴ Corral, Sheila. 'Key skills for students in higher education,' *SCONUL Newsletter* 15, Winter 1998, pp25-29.

⁵ Bainton, Toby. 'Information literacy and academic libraries: the SCONUL approach (UK/Ireland)'. Paper presented at 67th IFLA Council and General Conference, August 16-25, 2001

⁶ *Joint Statement of the Research Councils'/AHRB's Skills Training Requirements for Research Students*. <http://www.grad.ac.uk>.

⁷ *Information for Health*. London: NHS Executive, 1998.

⁸ *Working Together with Health Information: A Partnership Strategy for Education, Training and Development*. London: NHS Executive, 1999.

⁹ *Making Information Count: A Human Resource Strategy for Health Informatics Professionals*. London: Department of Health, 2002.

¹⁰ *Working Together, Learning Together: A Framework for lifelong learning for the NHS*. London: Department of Health, 2001.

¹¹ <http://www.nhsu.nhs.uk>.

¹² Booth, Andrew and Brice, Anne. Eds. *Evidence-based practice for information professionals: a handbook*, London: Facet, 2004.

¹³ Palmer, J. and Streatfield, D. 'Good diagnosis for the twenty-first century'. *Library Association Record*, 97(3), 1995, pp153-4

¹⁴ American Library Association. Presidential committee on information literacy. *Final Report*. Chicago: ALA, 1989

¹⁵ <http://www.tfpl.com/toolkit>.