COVER SHEET

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Developing a culture of evidence based practice within the library and information profession: the impact of library science education. A teaching and learning model from the Queensland University of Technology

Helen Partridge & Gillian Hallam
School of Information Systems
Faculty of Information Technology
Queensland University of Technology
Brisbane, Australia

Abstract

Evidence Based Practice (EBP) has recently emerged as a topic of discussion amongst professionals within the library and information industry. Simply stated, EBP is the process of using formal research skills and methods to assist in decision making and establishing best practice. The emerging interest in the EBP within the library context serves to remind the library profession that research skills and methods will ensure that the library industry remains current and relevant in a rapidly changing environment. The future of EBP within the library context relies upon effective cooperation between industry professionals, library science educators and professional associations. This paper will consider the role of library science education in ensuring the future of EBP within librarianship. Aware of its role to industry as a supplier of employees to the marketplace, the Queensland University of Technology (QUT) is continually reviewing its library science curriculum to more readily embrace the needs of current industry practice. This paper will discuss the teaching and learning model that is being at the Queensland University of Technology to foster student awareness and understanding of EBP and its practical role in the library and information industry. The paper examines the experiences of both the teaching staff and the students in practicing EBP within an industry context and considers the contribution the course makes in developing an EBP culture within the Australian library and information profession.

Introduction

Increasingly, the library and information practitioner is being encouraged to engage in research in order to "create new knowledge and thereby contribute to the growth of LIS as a profession or discipline" (Juznic & Urbanija, 2003, p.325). Crumley and Koufogiannakis (2002) propose that "when a librarian encounters a workplace problem or question to which there is no answer, conducting research to answer that question benefits the entire profession" (p.112). In 2001 the Centre for Information Research was commissioned by the Chartered Institute of Library and Information Professionals (CILIP) to conduct an examination into the research landscape for library and information science. The examination concluded that research is "important for the LIS domain in a number of ways" (McNicol & Nankivell, 2001, p.77). At the professional level, research can inform practice, assist in the future planning of the profession, and raise the profile of both the discipline and the library and information service itself. At the personal, level research can "broaden horizons and offer individuals development opportunities" (McNicol & Nankivell, 2001, p.77). However it was noted that "work is needed to stimulate greater interest in, and respect for, research within the LIS community" (McNicol & Nankivell, 2001, p.82). It was recommended that "research should be promoted as a valuable professional activity for practitioners to engage in" (McNicol & Nankivell, 2001, p.82). The study concluded, however, that for this to occur, there must be an "obligation on the part of library schools, employers and professional bodies to ensure the practitioners have the necessary skills to be able to conduct research effectively" (McNicol & Nankivell, 2001, p.82).

This paper will consider the role of library education in fostering a research culture within the profession. More specifically, the paper will discuss the teaching and learning model developed at the Queensland University of Technology (QUT) to develop student awareness, understanding and skills in evidence based information practice. The paper is divided into two parts. The first part considers the role of evidence based

practice within the library and information profession. A brief review of key literature in the area is provided. The second part discusses the teaching and learning model developed by QUT to embed the skills, knowledge and understanding of evidence based practice in the library curriculum. The paper concludes by considering the role library education can, and should, continue to play to establish an evidence based culture within the profession. The paper also considers the significant contribution to be made by the individual practitioner, the employer and the professional association in this context. The paper aims to open discussion on the future (if any!) of the library and information profession without evidence based practice, and the consequent implications for the skills and knowledge needed by the evidence based information professional.

Evidence Based Practice and the Library and Information Profession: A Brief Review of the Literature

Evidence Based Practice and Evidence Based Librarianship: A Few Definitions

Evidence based practice has progressively become a topic of discussion within the library and information literature. Evidence based practice is founded in Evidence Based Medicine, which has been described as "an approach to decision making in which the clinician uses the best evidence available in consultation with a patient to decide upon the option which suits the patient best" (Gray, 2001, p.17). More simply stated, evidence based practice is based on the concept that "practice should be based on up-to-date, valid and reliable research" (Brice & Hill, 2004, p.13).

In her inaugural speech in 1997, Rachael Anderson, then President of the Medical Library Association (MLA), suggested that librarians needed to develop their own version of evidence based practice (Anderson, 1998) In that same year the term evidence based librarianship was first introduced into the broader library and information profession's vocabulary by Jonathan Eldredge (1997).

The first attempt to define evidence based librarianship was provided by Andrew Booth. In 2000 he adapted a pre-existing definition of evidence based practice. Booth notes that the definition has the "advantage of being coined by a librarian, Anne McKibbon from McMaster University" (Booth & Brice, 2004, p.7).

> Evidence based librarianship (EBL) is an approach to information science that promotes the collection, interpretation, and integration of valid, important and applicable user reported, librarian observed, and research derived evidence. The best available evidence moderated by user needs and preferences is applied to improve the quality of professional judgements.
>
> (Cited in Booth, 2002, p.53)

In 2002 Jonathan Eldredge offered his definition of EBL:

> Evidence based practice (EBL) seeks to improve library practice by utilising the best available evidence in conjunction with a pragmatic perspective developed from working experiences in librarianship. The best available evidence might be produced from either quantitative or qualitative research designs, depending upon the EBL question posed, although EBL encourages using more rigorous forms over less rigorous forms of evidence when making decisions.
>
> (Eldredge, 2002, p.72)

Crumley and Koufogiannakis, noting that the current definitions of EBL were overly theoretical, offered a "practical definition for everyday referral" (p.62). Evidence based librarianship was defined as

> a means to improve the profession of librarianship by asking questions as well as finding, critically appraising and incorporating research evidence from library science (and other disciplines) into daily practice. It also involves encouraging librarians to conduct high quality qualitative and quantitative research.
>
> (Crumley and Koufogiannakis, 2002, p.62)

This last definition places a greater emphasis on "the improvement of professional practice together with the addition of the librarian as practitioner-researcher." (Booth, 2002, p.54)

In reviewing existing definitions of Evidence Based Librarianship, Booth (2002) compiled the following list of 'consensually based' defining characteristics of EBL:

- A context of day to day decision making
- An emphasis on improving the quality of the professional practice
- A pragmatic focus on the 'best available evidence'
- Incorporation of the user perspective
- Acceptance of a broad range of quantitative and qualitative designs
- Access, either first hand or second hand to the (process of) evidence based practice and its products. (Booth, 2002, p.54).

Booth also notes one significant omission form the list, and by consequence, from existing definitions of EBL: "a preoccupation with obtaining best value services for available resources" (Booth, 2002, p.54). Booth argues that this characteristic must be included as recognition of the "pragmatic real world thrust of EBL, coupled with its emphasis on decision making, requires that all decisions be taken in the context of finite resources" (Booth, 2002, p.54).

Evidence Based Librarianship or Evidence Based Information Practice?

In 2003 Booth challenged why proponents from within the library profession were so enthusiastic in adopting the term *evidence based librarianship*. Booth and Brice (2004) cite four sound reasons for the adoption of the preferred term *evidence based information practice (EBIP*):

- "The label 'evidence based librarianship' leads, as Crumley and Koufogiannakis (2002) recognise, to the inevitable confusion between librarians *supporting* evidence based practice and librarians *practising* evidence based practice" (Booth & Brice, 2004, p.6).

- The term 'evidence based information practice' places a stronger link between 'evidence based practice' which will allow the library and information profession to tap into "the emphasis on multidisciplinarity" (Booth, 2002, p.58) inherent in evidence based practice. The library and information profession will benefit from the "kinship with related [evidence based] professions such as teaching and social work" (Booth, 2002, p.58) and consequently will not miss out on new and interesting developments in other evidence based fields such as information systems which is closely related to those of evidence based librarianship (Booth & Brice, 2004, p.7).

- 'Evidence based information practice' acknowledges the wider context of information science (Booth & Brice, 2004, p.8).

- 'Evidence based information practice' places the focus on the "commonality of issues and methods within the domain of information practice with those that have emerged from the origins of the generic paradigm. Evidence based information practice is evidence based practice within information as both its subject and its object" (Booth & Brice, 2004, p.8).

Ultimately however, Booth (2003) anticipates that even the term "evidence based information practice will…write itself out of existence" (p.70). He proposes that:

> the long term future of evidence based information practice probably lies not in a single minded focus on research-derived evidence but in a more encompassing approach that embodies reflective practice. (Booth, 2003, p.70)

Booth indicates that the library and information professional of the future will be a *reflective practitioner* (with reference to the work by Schön,1991) "with the ability to critically analyse [and] make informed judgements" (Booth, 2003, p.70) by drawing on a range of catalysts, with research evidence representing one opportunity. Booth suggests "ultimately evidence based practice will contribute to a tool box from which the reflective practitioner will occasionally draw" (Booth, 2003, p.70).

This perception of the future is also favoured by Todd (2002):

> a profession without *reflective practitioners* [italics added] willing to learn about the advances in research in the field is a blinkered profession, one that is disconnected from best practice and best thinking, and one which, by default, often resorts to advocacy and position as a bid for survival (p.4).

Why is Evidence Based Information Practice Important?

The arguments for evidence based information practice have been well discussed within the LIS literature. In 2001, Williamson, Burstein and McKemmish proposed that "research can play a very valuable role in the practice of information professionals" (p.12). Six key reasons were identified to underscore the value of research to professional practice:

1. To assist in understanding the problems and issues which arise in the workplace
2. To add to knowledge in the field and/or provide solutions to problems
3. To maintain dynamic and appropriate services
4. To meet requirements of accountability – research is important in the age of accountability as it can assist in policy formulation and provide data to justify present funding or increased funding
5. To maintain and improve professional status
6. To provide a body of research findings and theory to inform practitioners (Williamson, Burstein & McKemmish, 2001, p.12).

Juznic and Urbanija (2003) observe that "research…[helps] LIS professionals to learn more about their work, perform better and offer a higher level of service to their clientele and users… research findings provide further motivation, guidance, and input to the successful services" (p.325). This idea is supported by Lowe (cited in Williamson et al, 2001) who contends that "research enables professionals to add value to their work and work practices" (p.12). Lowe extends the concept further by proposing that the use of research in practice makes a clear distinction between "professionals who maintain the status quo without question and those who strive to develop their work practices through continual evaluation and investigation" (cited in Williamson et al, 2001, p.12). Harvey (2001) builds upon this idea by arguing that "research and professional practice are inextricably linked" (p.xiii) and as such "research skills are a *prerequisite* [italics added] for those who want to work successfully in information environments" (p.xiii). He postulates that research skills represent an "essential set of tools which enable information *workers* to become information *professionals*" (p.xiii). According to Harvey:

> The work of information professionals is being transformed. The information services we offer, the information products we develop and sell, the information systems we design and implement, are undergoing rapid change. So, too, is the society in which we operate. We have a continual need to determine what is happening, how it is changing, how it will affect our places of work, how it will alter the services we offer. Change and its ramifications is the most important reason why research is necessary, and why it is here to stay. If you don't know something about the tools of research and about how to use these tools, then you cannot be an effective information professional.
>
> (Harvey, 2001, p.xii)

In 2001 the Special Libraries Association (SLA) released its revised Research Statement in which the role of evidence based practice, within current library and information work, is strongly advocated. In a recent commentary on the research statement, the SLA Research Committee and Joanne Gard Marshall (2003) suggest that, as the health and future of any profession depends on the members' ability to evaluate both themselves and their professional practice, the development of strategies to undertake evidence based practice may well be a valuable opportunity to improve and refine our own professional activities.

In further support of these views, the SLA research statement itself notes that

> These are challenging times for professional in all areas of practice. The consumer movement and the wide availability of information, including information that was formerly only accessible to professionals themselves, have led to a demand for increased professional competence and accountability. It is time for special librarians to recognize the potential value of formal and informal research in our field as the basis for evidence based practice. In the long term, such a knowledge base and its effective application will set information and library professionals apart in an increasingly competitive world of information service providers.
>
> (SLA Research Committee & Gard Marshall, 2003, p.43)

Juznic and Urbanija (2003) stress the importance of research, particularly in our own discipline: "Research is needed to create new knowledge and thereby contribute to the growth of LIS as a profession or discipline. If research is absent, non existent or even scarce, there is no profession, but only an occupation grounded in techniques, routine and common sense" (p.325). On a more pragmatic level the emerging literature exploring evidence based librarianship proposes that library and information professionals should 'practice what they preach'. Crumley and Koufogiannakis (2002) observed that "in our profession we help our patrons make decisions by leading them to research evidence. It is vital that we follow the same model: we should

consult our own literature when we have questions about best practices in our field" (2002, p.112). Ritchie (1999) also noted that, given our role as managers of the literature of research, library and information professionals are uniquely placed "to model the principles of evidence based practice, not only as they apply to other disciplines which we serve, but also as they apply to our own professional practice…'if you are not modelling what you are teaching you are teaching something else'" (Ritchie, 1999, para. 6).

Evidence Based Information Practice: the Challenge for Library and Information Science Education

Crumley and Koufogiannakis (2002) observed that "fostering an appreciation of research and how it relates to the profession is necessary for librarianship to grow and become more evidence based" (p.69). They conclude that "teaching research skills to all library school students is essential for the growth of EBL within the entire profession" (p.69) and as such, they challenge current library education to "play a major role in encouraging new librarians to take an evidence based approach to their profession" (p.69).

A similar conclusion is reached in the 2004 publication on evidence based practice for information professionals by Booth and Brice. In this work the authors argue that "getting research into practice…requires relevant skills to be built into professional development and educational initiatives" (Brice, Booth, Crumley, Koufogiannakis, Eldredge, 2004, p.282). They propose that "lobbying educational institutions to increase research and appraisal skills teaching in the curriculum" (Brice et al, 2004, p.289) is one of several short term priorities required to "sustain momentum and engage new activists" (Brice et al, 2004, p.287) to the evidence based phenomenon.

At the 2nd International Evidence Based Librarianship Conference held in 2003, Schrader commented on the incongruity between the prominence of research in the ALA Standards for Accreditation of Masters programs in Library and Information Studies and the reality of current library education in the US. Schrader made the following lament: "Why research training is not a mandatory component of every accredited program remains a mystery to me, and why deficient programs are able to get and continue their accredited status is an even bigger mystery" (2003, p.171). These concerns may indeed echo across the educational institutions in other countries; both LIS educators and the accrediting bodies should heed the need to take action. The immediate and pressing challenge for library and information science education is to take an active role in fostering the development of the new evidence based information professional, and consequently to more effectively achieve the goal of providing industry with information professionals who are well equipped and able to function in the ever-changing information environment of the twenty first century.

Meeting the Evidence Based Information Practice Challenge: Library Education at the Queensland University of Technology

The Master of Information Management

The Master of Information Management (MIM) is a course offered by the School of Information Systems within the Faculty of Information Technology. The Masters program was introduced in 2005 with an initial cohort of 49 students enrolled in the course, 32 part-time and 17 full-time. The course builds on a Graduate Diploma in Library and Information Studies (GDLIS), with the curriculum informed by teaching and learning research activities to identify the core discipline knowledge and generic capabilities required by LIS professionals (Partridge & Hallam, 2004). The Masters course, comprising ten core academic units and two elective units, is completed in one and a half years full-time or three years part-time. Table 1 provides a description of the ten core units. The MIM seeks to "provide graduates with the skills to find employment in a range of diverse information roles" (QUT, 2005). On completion of the course, students will be eligible for professional membership of the Australian Library and Information Association (ALIA).

While the MIM is an example of a tertiary education course that aims to prepare graduates for employment, the academic staff are mindful of the enormous range of employment opportunities available to 'information professionals'. The landscape is extensive, from the broad levels of academic libraries, public libraries, State and National libraries, through to the narrower levels of special libraries and information centres, such as law libraries, health and medical centres, music libraries etc. Opportunities also exist beyond this more traditional library context, with career avenues available within knowledge management, records management, Internet and intranet development and so on.

Unit Title	Unit Synopsis
ITN200 Database Systems	The unit introduces students to the fundamental information concepts: rules, facts, and their embodiment in database systems. This unit also helps to develop skills in independent work, problem solving and critical thinking.
ITN201 Enterprise Architecture	This unit introduces students to the context, value and need for enterprise architecture within an organisation. The unit also helps to develop skills in creative and critical thinking, oral and written communication team work and the ability to work independently.
ITN273 Information Retrieval	This unit introduces students to the ever changing information environment. Students develop skills in identifying, accessing, evaluating and retrieving information resources to meet specific information needs. This unit also helps to develop skills in reflective practice, evaluation, oral and written communication as well as the ability to work successful independently.
ITN274 Management Issues for Information Professionals	The overall aim in this unit is to identify key issues and management strategies within libraries and other information agencies. The unit also helps to develop skills in critical thinking, evaluation and written communication.
ITN275 Information Organisation	This unit provides an introduction to the rules and standards of bibliographic description, and shows how they are applied to description and classification for different types of user needs. The unit also helps to develop skills in reflection, creative thinking and evaluation, project management and oral and written communication.
ITN276 Information Services	This unit seeks to develop students' understanding of the key issues involved in developing, managing and evaluating a contemporary and innovative information service. The unit further seeks to develop oral and written communication skills, critical thinking, teamwork skills, and project management ability.
ITN266 Principles of Information Management	In this unit students focus on the management of information as an enterprise resource. The unit also helps to develop critical thinking, evaluation and problem solving skills.
ITN278 Web Content Management	In this unit students aim to develop an understanding of the principles underpinning web content management including, interface design and presentation issues and web information management. The unit also helps develop evaluation, critical thinking and problems solving skills.
ITN279 Information Literacy Instruction	This unit provides the opportunity for students to develop both a theoretical and practical understanding of information literacy and how to develop the information literacy of diverse clients. The unit also helps to develop skills in oral and written communication and critical thinking.
ITN280 Professional Practice	This unit provides students with the opportunity to spend time in the professional working environment via fieldwork placements, as well as to explore many of the issues that have an impact upon professionals working in information agencies. Students are encouraged to reflect on their own knowledge, skills, and abilities gained throughout the course of study, through the completion of a professional portfolio.

Table 1: The Master in Information Management Core Curriculum

What Skills and Knowledge are Needed for Evidence Based Information Practice?

It would be valuable to have a clear understanding of the skills, knowledge and attitudes required for evidence based practice within the profession which could serve to inform the development of the LIS curriculum as a vehicle for fostering the advancement of evidence based information practice. However, at present there exists no detailed listing or discussion on this issue. Booth and Brice recently stated that "specifying generic skills required for the development of EBIP at all levels (individual, organizational and policy), and allowing for flexibility in augmenting these with additional specialist skills, would be a major step forward, both in formal and in continuing education" (2004, p.285). Ongoing dialogue within the profession has clearly established that "research can and does play a vital role in professional practice" (Harvey, 2001, p.viii), indeed, "it is more important than ever to build our knowledge base and to use evaluation research methods to constantly monitor and improve the quality of the services provided" (SLA Research Committee & Gard Marshall, 2003, p.40). The current paper endeavours to contribute to the current professional debate by providing one perspective on the skills, knowledge and attitudes required by an evidence based library and information professional, and by explaining how the LIS curriculum can be designed and delivered to allow future information professionals to develop in these areas.

One of the key objectives at QUT is to develop new graduates who are enthusiastic and confident about their new profession – a dynamic and exciting world of library and information studies. Aware of its role to industry as a supplier of employees to the marketplace, QUT undertakes an ongoing review process for the library science curriculum to ensure it continues to embrace the needs of current industry practice. The world of libraries and information agencies in the 21st century is highly dynamic; while some traditional elements of librarianship remain important, the desired skills set for information professionals is rapidly expanding into new areas of knowledge. As the new LIS professional will be employed in a rapidly changing, information intensive working environment, he or she will need to not only have the ability to combine theoretical discipline knowledge with the practical application of this knowledge in a range of different situations, including situations in an unknown future, but to also embody a range of "holistic capabilities which represent the links between discipline knowledge and professionals skills' (Bowden & Marton, 1998, p.12). In terms of curriculum content, this encompasses the need to acquire sound disciplinary knowledge as well as to develop the personal attributes and attitudes, commonly referred to as 'generic capabilities', which are needed for a successful career as an LIS professional. At the highest level, QUT LIS educators believe in the need for a holistic approach to student learning where the personal and professional dimensions are intertwined. The authors of the current paper propose that is it this holistic focus in LIS education which will help twenty first century library and information professional to develop into, as proposed by Booth, a 'reflective practitioner' who has the ability to "critically analyse [and] make informed judgements" (Booth, 2003, p.70) drawing on a 'toolbox' of skill and knowledge which will include evidence based practice.

The focus on generic capabilities within LIS education is not new. The *Reading the Future for Library and Information Services Education and Practice Conference* held in Melbourne in 1996 made several important recommendations regarding LIS education, including incorporating generic transferable skills into the LIS curriculum (Todd, 1997). The importance of this point has been emphasised by ongoing dialogue and research throughout the world and by the importance given by professional bodies such as the International Federation of Library Associations and Institutions (IFLA), the American Library Association (ALA) and the Australian Library and Information Association (ALIA) to continuing education programs that not only incorporates discipline specific knowledge but also generic capabilities. As a case in point the Professional Development (PD) Program managed by ALIA provides a means by which members can document and monitor their professional growth. "The dynamic environment of the library and information sector dictates the need for library and information professionals to remain flexible and adaptable to change… Lifelong learning extends and develops the knowledge, skills and competencies of practitioners. It also enables them to prepare for their work more effectively, to broaden their career and to undertake new tasks" (ALIA, 1998, para 2-3). Significantly the distinction is made in the program between the necessity of developing skills in both the "LIS Specific Areas" and "Generic Areas". The latter refers to skills such as team membership, effective communication and critical and evaluative thinking. It is becoming apparent that library educators must not lose sight of the need for LIS courses to "equip graduates with a range of enterprise skills, transferable skills, including interpersonal communication, teamwork, report writing skills, numeracy, computer literacy, time management and so on" (Day, 1997). Generic capabilities must be considered in the current climate of change within the LIS profession, and by consequence, in LIS education.

From 2002 to 2004 QUT funded a research project aimed at identifying the key knowledge and skills required by the library and information professional of the twenty-first century (Partridge & Hallam, 2004). Participants in the study included library and information professionals, educators and students from South East Queensland. Focus groups were used for data collection with 98 participants taking part in 11 sessions. The focus group discussions resulted in the identification of 14 fields of discipline knowledge and 10 generic capabilities essential for the modern day library and information professional. A breakdown of the skills and knowledge regarded as essential to the library and information professional in these areas is provided in Tables 2 and 3. Full details on the research project can be found in Partridge & Hallam (2004).

In short, the current paper supports the view proposed by Booth (2003) by advocating that, to develop the 'new evidence based information professional', LIS education must focus on fostering the development of 'reflective practitioners' who are not only discipline savvy but also highly skilled in the area of generic capabilities.

	Fields of discipline knowledge	Scope of field
1	Information and society	The role of information in society as a social, cultural and economic motor.
2	Ethics & legal Responsibility	The study of : • ethical considerations that arise in the storage, processing, retrieval and use of information and information systems • standards of conduct for information professionals in the performance of their duties • legal issues that apply in relation to the storage, processing, retrieval and use of information and information systems.
3	Management	The study of management theories and the basic principles of management as they apply to libraries and information centres.
4	Information organisation	The study of the description and organisation of information resources to facilitate information access and retrieval
5	Information services	The study of the design and delivery of relevant and efficient information services.
6	Collection management & development	The study of the activities associated with the development and management of, and access to, library and information resources.
7	Information resources and retrieval	The study of the theory and practice of reference and information services.
8	Information literacy instruction	The study of information use theory, contemporary teaching theory and instructional design.
9	Information management	The study of: • of management principles to the acquisition, organisation, control, dissemination and use of information relevant to the effective operation of organisations. • knowledge within the context of an organisation, including information and knowledge creation, codification, sharing and learning.
10	Information systems for library and information professionals	The study of the application of computer-based systems in libraries and information centres.
11	Web content management	The study of the design and management of Internet and intranet sites.
12	Career planning skills	An understanding of the skills essential for successful career planning including employment seeking strategies and career planning.
13	Records management and archives	The study of the application of management principles to the control of an organisation's records. The study of the management and control of records that are judged to have permanent value.
14	Research	The generation of knowledge through the ability to systematically gather and analyse data to advance library and information science theory and its application to the provision of information services.

Table 2: The LIS discipline knowledge required by the Library and Information Professional of the Twenty First Century.

	Generic Capability	Description
1	Information Literacy	Information Literacy is the ability to recognize when information is needed and being able to locate, evaluate and use effectively the needed information.
2	Lifelong Learning	Lifelong Learning is the ability to learn how to learn in all facets of life (i.e. professional, personal and educational).
3	Teamwork	Teamwork is the ability to work effectively with others in a group with the view to achieving defined goals. Two distinct roles necessary for teamwork are the team member and the team leader. A team member makes a productive contribution to the collaborative effort of the group by participating in the pursuit of group goals under the guidance of the team leader. The team leader makes a productive contribution to the collaborative efforts of the group by providing guidance to ensure desired goals are met.
4	Communication	Communication is the ability to exchange feelings, ideas and information with others in an appropriate manner. Communication consists of the two key aspects of oral and written skills. Oral communication involves using the human voice to effectively articulate a message to an intended audience. Written communication involves using text or graphics to effectively transmit a message to an intended audience.
5	Ethics and Social Responsibility	Ethics and Social Responsibility relates to an awareness of the need for and commitment to the maintenance of high professional standards and social justice.
6	Project Management	Management is the ability to plan and to achieve desired goals to meet specified standards and criteria or to adapt to a changing environment through the effective co-ordination of available resources.
7	Critical Thinking	Critical Thinking is the ability to reach conclusions through reflection and evaluation by applying independent thought and informed judgement.
8	Problem Solving	Problem Solving is the ability to find effective solutions to problems through creative reasoning.
9	Business Acumen	Business Acumen is the ability to understand and contribute to the corporate culture and the business environment of the parent organization.
10	Self Management	Self-Management is the willingness and ability to develop a mature and balanced understanding of self. The ability to apply reflective practice to support ongoing personal and professional growth will enhance individual strengths and minimise weaknesses.

Table 3. The generic capabilities required by the Library and Information Professional of the twenty-first century.

Evidence Based Information Practice and LIS Education: The Issues

Developing an LIS curriculum relevant to the ever changing needs of the twenty first century is inevitably challenging. Three key issues must be considered when embedding the skills, knowledge and attitudes essential for evidence based practice into library education: the lack of homogeneity within the student cohort, the diversity of potential future career paths, and the constantly evolving discipline knowledge.

- The students entering LIS education are not a homogeneous group. The students represent a wide diversity of differences including gender, personal interests, employment history, academic background and life experiences. These differences have significant implications for staff who aim to foster knowledge and skill within research methods as applied to the library and information context. The diversity in university education of students is one way of illustrating this point. From 2002 to 2004 the LIS students were invited at the beginning of year each to complete an incoming student survey. A total of 107 completed surveys were received. This survey provided a basic profile of the students which could be used to further develop and refine the education program to the student's specific needs (Hallam & Partridge, 2005). In terms of previous education, 81% of the students surveyed had entered the library program as their first postgraduate course. The majority of students had an Arts degree (53%), with education graduates being the next most significant grouping (13%). 17% of respondents had completed a vocational course in addition to their university studies, with 26% having multiple university qualifications, eg more than one bachelor degree or postgraduate qualifications such as a postgraduate diploma, honours or masters degree. The main foci of the additional qualifications were education, business and information technology, although there was an eclectic range of fields including retail, tourism, horticulture and community services. Those students who had postgraduate qualifications included Honours (5.5%), Masters (4.5%) or postgraduate certificate or diploma (8%). There was one student who had a PhD. So whilst some students may have obtained research training though post graduate qualifications, for the majority of students this was not the case. Also of interest is that students have completed their earlier education at different universities, with the result that it was unlikely that there were many common denominators in terms of the research methodologies experienced. The QUT context is probably no different to many universities in Australia or, indeed, around the world.

- The students entering LIS education have very different future career paths. One of the more interesting, and challenging, aspects of library education is preparing students to be successful in one of the many possible career choices. The students entering LIS education at QUT all have very different career ambitions. This was clearly demonstrated in the 2002-2004 survey of LIS students enrolled in the QUT program. The 107 students were asked to indicate what type of library or information work they would enter upon graduating from the LIS program. They were given the option of nominating: public, academic, government, law, special, other, no preferences. If they nominated special or other they were asked to elaborate on their choice. Study findings clearly showed that students had very diverse career goals with a large percentage of the students indicating an open future with either no specific preference provided, or a preference for 3 or more of the options. Possible future work contexts identified by students included libraries or information agencies specializing in: arts and multimedia, music, environmental management, landscape architecture, archives, information broker, medical information, knowledge management, website development, and school librarianship.

One of the biggest challenges facing contemporary library education is developing a curriculum that encompasses the traditional and enduring knowledge of the profession alongside the new and emerging areas. Put simply the library curriculum is becoming increasingly congested. This is not a new problem. In 1992 Clayton observed that "it is simply not possible to cover all the essentials for professional preparation in a single short year. The [library] schools are already torn between the need to provide a theoretical basis for information work that will be of enduring value, and to equip graduates with skills that will be of marketable value in a very tight employment situation. As a result research gets left out" (p.74). Even though QUT has this year extended its LIS program to one and a half years (as opposed to one year), the challenge to deliver a well rounded curriculum continues.

Evidence Based Information Practice: The QUT Teaching and Learning Model

The MIM program has been designed and developed as a positive, non-threatening learning context through which the future library and information professionals may acquire "the conceptual structures and thinking processes of [their] discipline" (Toohey, 1999, p55). The individual's journey to becoming a professional involves active engagement with two processes: individual change and development by acquiring new knowledge and attitudes, and adopting the cultural dimensions of the profession itself (Boshuizen, Bromme and Gruber, 2004). The MIM course seeks to support the students' transitional journey into the LIS profession through the interplay of a range of teaching and learning strategies. The program is underpinned

by the holistic philosophy that encourages the development of the whole person through a curriculum that successfully encompasses both discipline knowledge and generic capabilities. Specific characteristics of the program include the direct involvement of industry practitioners, authentic learning activities, research skills and reflective practice.

The seamless integration of the two dimensions of learning, discipline knowledge and generic capabilities, achieving a balance focus, time and resources within the 13 week semester timeframe remains an ongoing challenge for the MIM teaching. Each of the three semesters has been carefully crafted to provide a scaffolded learning context for the students to provide a guided curriculum that allows them to progressively develop their skills and knowledge. Each new semester helps the learners build upon the skills and knowledge acquired in the previous semester. Rather than having whole subjects dedicated to the development of specific generic capabilities within the curriculum (cf professional studies units), the academic staff at QUT have adopted the view that generic capabilities are best learnt when contextualised within the discipline itself.

The involvement of industry practitioners contributes significantly to the success of QUT's holistic model of LIS education. Industry professionals provide the authentic context from which students can directly learn about discipline knowledge and generic capabilities within the profession. At QUT, industry practitioners have taken on three vital roles in the MIM learning environment: as guest speakers, as mentors and as industry partners in the learning activities.

The importance of real world examples cannot be underestimated, as students need to appreciate the application of the theoretical structures within a range of diverse situations, given the individuality and often uniqueness of LIS institutions. Drawing guest speakers into the academic program is therefore an integral ingredient in this learning environment. It is through the direct involvement of practitioners that students grasp the amazing diversity of information problems and the range of possible approaches to solve them.

Reinforcing Kolb's (1984) views that "an excellent education in any field should extend beyond the classroom", valuable learning is achieved through the mentoring program run jointly with the professional association, ALIA, which involves students being paired with an industry professional. The mentors and mentees get together in their own time and in their own ways: some in the workplace, some more socially over coffee or lunch. Mentoring is a natural part of life for information professionals, as noted by Field: "It is part of the ethos of our profession to share knowledge. We are not natural competitors like those within the business world. (Mentoring) is an excellent way for professionals to leverage their expertise and serves as a mechanism to continue their own professional growth" (Field, 2001, p.273). Mentors can also foster an understanding of the relevance of generic capabilities in the workplace, such as problem solving and critical thinking as well as lifelong learning, to be able to deal with a range of complex situations, ethical and moral principles. The program is therefore an example of a strategy designed to meet the need for more elaborate induction programs for new professionals "with greater obligations on the professions to participate in professional education through coaching and mentoring programs – in association with universities" (Gonczi, 2001, p.2). At the same time, the industry practitioners personally gain a great deal by being introduced to the current approaches to learning at QUT which include the focus on reflective practice and evaluation.

Through the learning tasks themselves, industry practitioners and employers offer a fertile context for students to apply the skills and knowledge they are acquiring within the academic confines of the MIM. Fieldwork placements and industry based projects are an invaluable source of linking theory to practice within an authentic learning environment. They also provide the opportunity for students to begin to think critically about the skills, knowledge and attributes that they are personally developing as they progressively acquire the conceptual structures and thinking processes of working information professionals.

It should be noted that the MIM teaching team believes that the primary aim of the MIM is to prepare graduates for their roles as future library and information practitioners, rather than as academic researchers. The MIM, like many other LIS education programs in Australia, is a course work program. Whilst QUT does offer both a Masters by Research and a PhD program, and students are actively encouraged to pursue these avenues at some point in their career, QUT is very much aware that academic research is not a path that the majority of MIM graduates initially wish to follow. Consequently, the MIM has a focus on fostering skills in evidence based practice or research in practice, rather than academic research. To this end the teaching of research skills has been embedded in the context of the discipline knowledge itself.

Research skills are specifically introduced to students within the second semester unit, ITN276 Information Services. Students learn about the range of research methodologies that can be applied within the working environment. They are asked to undertake a major group project which requires them to gather sound evidence that will allow for a critical evaluation of an existing (real) information service. Students work with

the industry practitioners who host the assignment to consider the research methodology which is best suited to the evaluative tasks they undertake. This assignment is valued by students as it gives them the opportunity to develop sound foundational skills which they can use once employed in industry. For those students interested in further developing and refining their research skills an elective unit – ITN315 Information Management Project – is available for students to undertake industry based projects that require the student to draw on the wide spectrum of skills and knowledge they have been developing in the MIM, including research skills or evidence based practice. Increasingly, libraries and information agencies in the region are contacting QUT staff to initiate interesting and challenging project work that enables students to become directly involved in authentic research activities.

The focus of the major assignment in ITN276 is primarily on the process of research rather than on the final product itself. Students are asked to reflect on their learning through the tasks they have completed and to consider how they would improve on the approach taken in a future scenario. Reflective practice is increasingly identified as a core skill required by all professionals. For many students entering the MIM, reflective practice is a novel and unexplored – and often challenging – domain. Taking this into consideration the MIM program has been designed to provide students the opportunity over the three semesters to progressively gain both theoretical understanding and practical experience in reflective practice. Four units over the three semester long program have been developed to provide the context for the students to learn about, and experience reflective practice first hand:

- *ITN273 Information Retrieval* (Semester One) provides the opportunity for students to develop a theoretical understanding on reflective practice and to begin using reflective practice as a tool for self evaluation as they develop their information literacy skills.

- *ITN275 Information Organisation* (Semester Two) allows students to consider the role of reflective practice as a vehicle for self directed learning as they compose a reflective learning journal to support the construction of their own understanding about bibliographic database development.

- *ITN276 Information Services* (Semester Two) allows students to learn about the role reflective practice can have as a tool for professional development in other skills such as teamwork project management and informed decision making in the context of the information service evaluation.

- *ITN280 Professional Practice* (Semester Three) provides the students the opportunity to observe and use reflective practice within the context of 'real life' information work as they complete their fieldwork placements. Their studies conclude with the creation of a professional portfolio which presents their reflections on their own role as an information professional.

Table 4 provides a brief overview on the learning outcomes for students over the course of the three semesters as they develop their skill and knowledge of reflective practice.

Semester One

On successful completion of this semester students will be able to:
- Discuss the concept of reflective practice as a learning tool (ITN273)
- Write a short reflective discussion on an activity experienced. (ITN273)
- Write a short reflective discussion that critically evaluates the strengths and weaknesses of their own work including a grade allocation. (ITN273)

Semester Two

On successful completion of this semester students will be able to:
- Compile a self paced learning journal over a 13 week period to assist with skill acquisition and knowledge development in a specific area. (ITN275)
- Apply the principles of reflective practice to team, self and goal development within the context of a group project team. (ITN276)
- Discuss the concept of reflective practice as a professional development tool (ITN276)

Semester Three

On successful completion of this semester students will be able to:
- Observe and comment on the role of reflective practice within a 'real life' work context (ITN280)
- Demonstrate their ability to apply reflective practice in the development of a professional portfolio (ITN280)

Table 4: Scaffolded approach to reflective writing skill and knowledge development

The model developed and implemented by QUT, incorporating a blend of discipline knowledge and generic capabilities, industry involvement, authentic learning activities and reflective practice, is but one example of an approach to embedding EBP within an LIS curriculum. As the model itself is embryonic, it is far from being a final, fully developed approach to educating the contemporary library and information professional for success in EBP. By way of 'practicing what is preached', QUT LIS educators are themselves reflective practitioners who engage in their own evidence based teaching by continually questioning, reviewing and examining their approaches to learning and teaching, and by gathering evidence from students, recent graduates, industry practitioners and the professional literature to further develop and refine the learning activities within the curriculum. Evidence of this reflective approach to LIS education can be found in several recent publications (Hallam & Partridge, 2002; Hallam & Partridge, 2003; Partridge & Hallam, 2003a; Partridge & Hallam, 2003b).

Discussion

Evidence based practice can be regarded as one of the most significant contemporary developments for the library and information profession. At the IFLA conference in 2003, Tord Hoivik suggested that "evidence based [information] practice represents something different: a deliberative approach to change" (p.5) and that by embracing evidence based practice the LIS profession is acknowledging, and reaffirming, that it is a "learning profession" (p.6). But how does the LIS profession embrace and foster a culture of evidence based practice? How does it commit itself to becoming a "learning profession"?

The issue of professional learning and how a professional evolves has been considered by Boshuizen, Bromme and Gruber (2004). This work provides an interesting insight into the broader areas of professional development and preparation. The authors propose that a professional, regardless of their discipline, progresses from the status of novice to that of expert by "a process of continually transforming the repertoire of knowledge and skills that make up expertise". In short, they suggest that lifelong learning is the key to a professional become an expert in their own field. According to Boshuizen et al, a professional must develop both academic knowledge and professional knowledge, with academic knowledge imparted via formal training in a university and subsequently transformed into professional knowledge by learning in the workplace.

Booth (2002) observed that one of the main assumptions in fostering a culture of evidence based practice is that "practitioners are enlightened enough to *want* to practice evidence based practice". For EBP to succeed therefore, library and information practitioners need to be willing to develop the skills and knowledge essential for evidence based practice and to be motivated to use these within the context of their day-to-day work. Whilst current LIS education can help to foster the birth of a new breed of evidence based information professional, ultimately it is up to the new professional working in industry to put into place the skills they have learned during their academic studies. It is also the responsibility of those practitioners who have been in industry for some time, and who have not had the opportunity to learn about EBP via their formal library studies, to develop the necessary skills, knowledge and understanding of EBP by undertaking professional development (PD) activities.

However, the individual practitioner clearly cannot succeed in developing a culture of evidence based practice without the support of both their employer and their professional association. Employers have a responsibility to provide an environment that encourages and rewards EBP and to provide access to the resources and training needed to implement EBP within the work context. Professional associations have a responsibility to encourage, enable and reward the development of EBP skills and knowledge within the profession as well as developing and articulating the profession's EBP policies and future directions.

These views suggest that, whilst formal LIS education has a vital role to play in fostering a culture of evidence based practice (be it as advocated via the QUT model through the development of reflective practitioners or through any alternative models employed by other LIS educators) within the library and information profession, success will only be achieved when all stakeholders in the profession actively work together to build the desired culture. For the LIS profession this means cooperation and collaboration between library practitioners, library educators, library employers and the professional associations. Table 5 illustrates the contribution that could feasibly be made by each of the different stakeholders in pursuing the EBP goal.

Stakeholders	Roles or Responsibilities
Practitioners	*Individuals have a responsibility to:* • Have the motivation to be an evidence based information professional. • Ensure that they acquire and maintain the knowledge and skills necessary for evidence based practice by completing professional development programs • Undertake work based or higher degree research and actively take a role in establishing a clearer and stronger link between theory and practice within the profession • Strive towards completing higher degree research degrees
Educators	*Educators have a responsibility to:* • Provide and promote educational courses and qualifications necessary for developing evidence based information practitioners • Seek opportunities for updating own practical skills and knowledge to ensure relevancy and currency of curriculum • Provide and promote research degrees such as Masters by Research and PhD's to the profession. • Develop and deliver professional development courses in the area of evidence based practice. • Actively pursue research activities to generate new theoretical knowledge. • Seek opportunities for cooperative research and development activities
Employers	*Employers have a responsibility to:* • Provide the opportunities and resources for practitioners to engage in evidence based practice, including dissemination of findings to the profession • Encourage and allow their staff to engage in ongoing learning and professional development necessary for maintaining skills and knowledge in evidence based practice • Provide opportunities for LIS students to learn about evidence based practice in situ through fieldwork and project work • Participate in LIS course advisory work • Serve as guest lecturer/tutors within Library education programs • Include evidence based practice activities as part of the staff appraisal program • Encourage mentoring of evidence based practice for novice or inexperienced research-practitioners • Provide opportunities for collaboration with academic researchers and other industry employers on research project and funding
Professional bodies	*The professional association has a responsibility to:* • Encourage, enable and reward the learning and development of skill, and knowledge in evidence based practice within the profession • Determine and articulate a policy position on the role of evidence based practice for the profession as a whole and in the education for library and information professionals specifically • Encourage employers to support evidence based information practice by recognising institutional members' involvement in, and dissemination of, evidence based projects as eligible for individual's PD points • Ensure that the profession's research agenda, priorities, values and expectations are heard in government and by other key policy and decision makers • Offer research awards and funding opportunities • Facilitate forums for sharing and dissemination of evidence based practice knowledge • Arrange partnerships with training providers to provide training courses in evidence based practice tailored to the specific needs of diverse contexts (i.e. public libraries, law libraries etc)

Table 5: Stakeholders' roles and responsibilities

In 2004 Peter Macauley, a librarian at Deakin University challenged Australian LIS practitioners and educators to reconsider what is relevant and necessary training and education for the profession in terms of research skills. Macauley argues that the "PhD has a place in professional practice". He suggests that the doctorate is the "ultimate in professional development" for the library and information professional. It "is a flexible, multi-vocational form of training, and is well suited to professionals undertaking applied (and theoretical) research in the workplace" (p.6). Macauley suggests that the benefits of a doctorate are many "including an opening of your mind – and hopefully the minds of others; getting out of your comfort zone; the ability to critique the work of others, and for others to critique yours; and importantly, to make a contribution to Australia's knowledge base" (p.6). Macauley concludes by proposing that "undertaking a doctoral program of study will make a significant contribution to professional practice and in doing so enhance Australian's reputation as a knowledge economy" (p.6). Macauley argues that the LIS profession cannot – and should not - rely on practice alone. Practice should be based on the evidence gathered through our own research activities.

In the US the ALA shows its support of EBP by the inclusion of research skills within its Standards for Accreditation of Masters Program in Library and Information Studies. LIS Programs should reflect "the importance of research to the advancement of the field's knowledge base" (1992, p.3). A direct reference to the important role of EBP within the profession in Australia can be found in the Association's research statement which asserts that ALIA:

> strives for best practice by promoting research which underpins innovation and by fostering a research culture where applied workplace research and the communication of outcomes support improvement and effectiveness in the provision of library and information services. (ALIA, 2002, para. 3)

ALIA outlines its goals for fostering research, to provide for:

- Encouraging research for innovative practice leading to excellence in professional practice
- The formation of partnerships between the Association, educators, researchers and the workplace so that there is a sharing of knowledge for mutual benefit in the conduct of research for innovative practice
- Support to new practitioners thereby building a research culture and increasing the capacity of the field for research which informs professional practice
- Research activities that are scientific in nature and of value to Australia: (i) in the application of library and/or information service to improve practice in Australia; and (ii) in the extension of knowledge to add to the sum total of knowledge in library and /or information science. (ALIA, 2002, para. 6)

In commitment to these goals, ALIA launched the Research and Exchange Partnership (REAP) as a partnership which will "enable the Association to become more proactive in the support and encouragement of Australian library and information (LIS) research, particularly research based in information practice". REAP has been established as "a network of peers working together to exchange ideas and information… to bring library and services practitioners and researchers together, both face-to-face and online to share ideas, information and experiences about doing research and using results of research" (ALIA, 2005, para, 2&3).

However, despite the rhetoric, at this point in time the achievements of REAP remain low key and require a considerable injection of energy to stimulate a greater level of collaborative activity. As an Association, ALIA is challenged to build on the initial REAP program to truly promote and encourage research as a key driver for professional development. By hosting the 3rd Evidence Based Librarianship Conference to be held in Brisbane, Australia, in October 2005, ALIA has a chance in the near future to play an important role in encouraging a better understanding of the issues, as well as encouraging a stronger degree of commitment on the part of practitioners and employers. Whilst LIS education can adopt a proactive stance in fostering EBP within the profession by including relevant and necessary skills within the LIS curriculum, an evidence based culture within the library and information profession will not be achieved unless all stakeholders are actively and proactively engaged with the process.

Conclusion

The QUT teaching and learning model presented in this paper is just one possible approach to embedding EBP within LIS education. The model adopted by QUT reflects the belief that fostering a culture of evidence based practice requires LIS education to serve as the cornerstone to equip library professionals with the necessary skills and understanding to become reflective practitioners in an evidence based industry, with the aim of progressing professional knowledge. Accordingly, QUT strives to develop a curriculum which focuses on content that is topical and relevant, but which at the same time helps develop the individual dimensions of the students so that they graduate with a sound understanding of the full spectrum of professional and personal attributes that they will need for successful careers as LIS professionals. It would be beneficial for LIS education, and for the future of the library and information profession in general, if other teaching and learning models were presented and critically discussed. This profession requires an informed discussion at both the national and international levels about the specific skills and knowledge required by the evidence based library professional, about the best manner teaching and learning approaches that will help to prepare and educate future evidence based professionals, and about ways to firmly establish an evidence based culture within the profession, so that the profession itself truly has a future.

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