

Emerging roles for the Librarian in Problem Based Learning

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Abstract

The collaboration of faculty and library in Problem Based Learning (PBL) has led to an abundance of studies in the medical and health sciences. This article reports on the emerging roles of librarians in studies on PBL implementation during the past 10 years. The initial analysis revealed studies which focussed on the effects of PBL on library usage. However the trend has since evolved to studies on the involvement of librarians in building and implementing the PBL curricula. The aim of this article is to summarize the main findings of these research. This would provide directions for policy makers and PBL practitioners. Librarians may also find new challenging roles for themselves within the academia. The studies included in the review were selected by conducting a literature search within identified online databases and selection was done based on empirical studies on PBL in higher learning. The outcomes reveal that there are many noteworthy efforts describing faculty-librarian involvement in PBL implementation in higher learning. It is concluded that a framework be proposed for the role of the librarian in the implementation of PBL.

Keyword: PBL, Librarian

Introduction

Problem-based learning originally gained popularity in the context of medical education. It is a teaching technique wherein the learning takes place in the context of solving real-world problems. The students are given a scenario based on a topic or dilemma, and they work in teams through a structured process of problem solving.

In the PBL environment, information skills (Rankin, 1999) or information literacy competencies (Cunningham & Lanning, 2002) are essential to the learning process. The Association of College and Research Libraries (2000) information literacy competency standards parallel the problem-solving process of problem-based learning. From the first standard "determining the nature and extent of the information needed", all the way to the fourth standard of "using information effectively to accomplish specific purpose" solving problem scenarios requires proficiency in all the competency standards to be completed successfully.

Since PBL is a student-centered curriculum, and librarians are significant providers of information literacy, librarians can help students learn how to find information using library resources, and how to evaluate that information so that they can produce better papers and projects (Cunningham & Lanning, 2002). As PBL is a form of education in which information is mastered in the same context in which it will be used, technology and an electronic curriculum are important tools in supporting problem solving and PBL. In discussing a curriculum for the information age, educational specialist urge us to use the emerging technologies and methods to help students develop skills to judge the reliability and validity of information (Tedesco, 1999).

Increased access to technology has altered the way that students search and use information, while the variety of electronic resources has widened the potential resource base for all students. These developments have reduced face-to-face teaching in the library and the need to visit the library building. Student most often assume that being technology savvy means that they are experts in looking for information. However, what comes to mind is 'Do students have the ability to evaluate and be selective of this information?' Their technology literacy cannot guarantee information literacy, as most teaching staff

would readily agree. Learning will take place when there is a curriculum model that incorporates the process of seeking, evaluating, and using information into the curriculum and consequently, into all students' experience. Orr, Appleton, & Wallin (2001) believe that this opportunity is presented to the librarians through PBL.

The aim of this article is to analyse the outcomes of studies and reports on the various levels of librarian's involvement in PBL curriculum and implementation. It is to recognize the various roles played by librarians in this area of research and to discuss the implications for educational practice and research.

PBL-Library Research

Studies on the effect of PBL on libraries, especially in the medical and health sciences have been gaining interest in the past years. With its emphasis on independent learning and information-gathering, the PBL environment promotes many values that librarians have believed in for years. As PBL became popular in the medical sciences and began to proliferate within other disciplines, librarians became aware of the increase in library usage and demand for information resources. Several librarians actually carried out studies to document this trend as libraries are ever so concerned about their usage especially as technology takes over. Studies in USA, Canada, UK and even Sweden began to survey the frequency of library visits, duration of use, loans patterns, and complexity of reference questions. Librarians wanted to know if students involved in PBL used the library differently, and if yes, how and does this have an effect on their learning outcomes.

Once the research on library usage showed positive relationships between PBL students compared to the students of the traditional curriculum, librarians took advantage and used this opportunity to bring forth their role as information specialist. It was time to emphasize information skills and information literacy, which were the librarians core competencies, as the way to life-long learning and independent learning. In time, studies focused on the librarian's role in the PBL curriculum. Information literacy and information skills become important aspects of the PBL curriculum. At the same time, libraries were promoting user education, so PBL posed an opportunity for librarians to gear information skills programmes to the PBL environment.

Method

The aim of this article is to bring together the findings of those studies that cover studies on the librarian's role or involvement in the PBL environment. A literature search was conducted on online databases available at the University of Malaya: LISANet, Library Literature & Information Science(WilsonWeb), EbscoHost, Emerald Intelligence, OVID, INFOTRAC and Proquest@Medical Library & Proquest@Educational Journals. Among the journals publishing articles on this subject matter were: *Medical Teacher*, *Research Strategies*, *Nurse Education Today*, *IFLA Journal*, *Reference Services Review*, *C&RL News*, *Bulletin of the Medical Library Association* *Health Libraries Review*, etc. Most of the literature was based on studies and reports on medical and health science. The keywords used were: problem-based learning, information literacy, information skills, library, librarian. The period from which studies and reports were selected covers the last 10 years (1993 -2003). Rankin's *Handbook on Problem-Based Learning* has been a good source of reference too. Additional literature not retrieved from the formal search, but relating to the area, were also included in the analysis. There is an indication that the studies included in this article might not completely cover all studies conducted on librarians' involvement in PBL. Care has been taken to reduce bias in the selection of studies.

Librarians In The PBL Environment

Librarians have always believed themselves as being custodians of information. With the impetus of technological advancement and "information" being available to all, librarians have faced the challenge to retain and uphold their role in the academia. The emergence of education policies to produce lifelong learners and independent learners, especially the PBL curriculum, has opened new paths for information

literacy, a core competency of all librarians. The challenge is now to enhance their standing in the academic environment by proving that the library is not just a place of records but also a service provider to life-long learners and independent learners. Faculty-librarian collaboration began to take shape more actively and for mutual benefit.

Curriculum Planning

In the mid 1990s focus on effect of PBL on library usage began to shift on how library staff may be utilized in PBL. In the medical and health sciences, the first initiatives began with inviting librarians as members in the PBL curriculum planning committee. Fitzgerald, Flemming, Bayley (1999) report that at the McMaster University, librarians serve on two of the first-year planning committee to contribute to the medical curriculum's information management component and information resource use by students. At McMaster the role of curriculum integration coordinator has even been added to the librarian's job description. Heaton & Sutherland (1999), in their guidelines to librarians in schools making transition into PBL based on two Canadian medical schools, support the participation of librarian in faculty planning committees. Among the benefits are to coordinate information technology applications; resource sharing; developing "problems" or "cases" where resources and course materials are identified. Eaton & Richardson's (1993) review of the librarian's role and involvement in PBL curricula, with an emphasis on Tufts University, also report that librarians are member of the PBL committee and their role is to advice on integration of library skills in the curriculum and also on availability of resources.

Facilitators (user education)

The presence of librarian on curriculum planning committees evolved from being just an advisor on availability of information resources to a more active role in implementation. Librarian began to act as consultants to PBL groups and later as facilitators. At the University of California, the Patient Doctor II course in which information management is learned, the role of the librarian is to simulate discussion to identify resources and later the librarian facilitates advanced search techniques in using online resources and also the Internet. Minchow's (1996) study revealed greater use of reference sources by PBL students and less querying of the librarian over time. This may be because students were now able to find information independently. Other findings were that study space was heavily utilized; the use of databases increased; significant changes in searching behaviour were evident and Minchow summarizes that students information-seeking skills were more advanced after the integration of information management into the PBL curriculum. Blake (1994) in his observation of students in McMaster University reports librarians as facilitators who were able to target students specific request for instruction.

Satterhwaite, et al. (1995) reports how several library faculty members at the McGoogan Library of Medicine, act as facilitators for PBL groups. In this case the believe is that librarians are skilled in group dynamics and know how to interact with people. Barrows (1985) believes that the subject expertise is a bonus for the tutor, but most important skill is getting students to work together to learn from each other, recognize learning issues and locate learning resources. As a result, librarian's contact with faculty has grown in number and depth. It has also been immensely rewarding and enriching in terms of the librarian's professional growth.

Schilling et al. (1995) and Minchow et al. (1993), describe how information literacy skills can be fully integrated into the PBL curricula. In their case, librarians are also used as facilitators for student groups working on problems together with the medical faculty members. Since the problem with facilitators is usually not imparting their information to students, but rather facilitating the finding of answers by students for themselves, librarians were valued for their abilities to clarify problems and issues and to point students in the right direction to find their own answers, as done by librarians at the reference desk every day. Schilling et al (1995) carried out a post-course evaluation at the University of

Pittsburg School of Medicine, and the overall survey feedback and comments indicated that the majority of students responded positively to PBL and they were particularly impressed with the information resources and the role of the librarian as facilitator. Minchow et al (1993) studied the changes in information-seeking patterns of medical students in a PBL curriculum. The researches have underlined some limitations of their survey but nevertheless they conclude that student's information-seeking skills are more advanced after the integration of information management into the PBL curriculum. Fosmire & Macklin (2002) report that through a project called LEADER, the librarians at Purdue University have integrated information skills into two undergraduate science courses. They believe that librarians are well positioned to facilitate the adoption of active learning, PBL into course curriculum. Even at the Earth and Atmospheric Science department both librarian and faculty write problem statements appropriate for the resources students will be using.

Resource consultants

According to Fitzgerald, Flemming & Bayley (1999) in one of the undergraduate MD program at McMaster University, which is entirely problem-based, students are provided handbooks with a list of resources available and the library staff are listed as 'people resources'. A number of librarians are assigned as resource persons to tutorials groups and the librarian has the responsibility to enable the students to identify key concepts to be investigated, identify keywords, terminology and select appropriate sources of information, in other words to integrate information literacy into the PBL.

Whitehead (1999) examined the New Pathway PBL at the Harvard University, which recognized the overload of information and the need for students to develop adequate lifelong learning skills, and reports that librarians became information consultants to groups of PBL students. 25% of the librarian's time is devoted to medical education information issues. Literature search assignments became a required component and searching effectiveness was evaluated by the librarians.

Tutor facilitators

Friden (1996) discusses the integration of library instruction or library skills into the curriculum. He supports that PBL and IT have created the opportunity for library instruction to be integrated into curriculum to make learning more meaningful. In addition he also suggests tours and training of the lectures by the librarians. Heaton & Sutherland (1999) also describe professional librarian's participation in tutor training sessions at the two Canadian medical schools as being successful.

Other interesting initiatives

There are some other interesting initiatives by various universities over the years to create a collaboration among faculty and librarian for the benefit of the students. These initiatives are in par with the changing technologies and increasing IT know-how among the librarians and faculty. Eeckhout (1996) describes the experience of the University of Maastricht, the first university in Netherlands to implement PBL. The university with collaboration of the library created a "Study Landscape" consisting of a collection of learning areas and learning resources managed by the library to create a logical transition to the library facilities later. There is constant liaison between the faculty and library on collection development and provision of advanced facilities for the processing of information, independent of teaching staff.

Rankin, Tedders, & Dever (1999) report that at Mercer University School of Medicine, which is fully PBL, the library support off-campus educational program through GaIN, the library electronic information network. The library provides skills to students for gathering information in an independent setting and support lifelong learning. Among the innovative strategies used by library staff are access to

MEDLINE, electronic mail and even assisting students in developing their own web pages to organize the internet resources. Carder et al. (2003) in their article about case-based, problem-based learning (CBPBL), which is a variation of PBL also support the potential use of CBPBL for introducing information literacy skills to students to encourage development of critical thinking and lifelong learning skills. The librarian may act as a facilitator to the CBPBL group, involved in the case writing and resource identification; or even as a liaison who would collect resources, prepare pathfinders and serve as consultant to both students and faculty.

In summary although most the literature are reports of experiences and practices at various institutions, it is clear that librarians can facilitate the integration of information resources into the curriculum, by offering their expertise in teaching information skills to students, helping faculty become knowledgeable about electronic information formats and also provide physical learning facilities for students. Information literacy is not only important in PBL curriculum but also in any other teaching strategy. In US the academic libraries have realized that resource-based learning at all disciplines will depend on electronic information resources and librarian's involvement in teaching information skills will be in demand. The librarians possess the expertise of finding, evaluating, organizing and applying information to problem solving. In US librarians are collaborating with faculty in instructional development through national initiatives (Rader, 1999). A two-year study designed to integrate the medical communication skills and library skills curricula at the University of the West Indies, St. Augustine by Godfrey & Ernesta (2002) reports that students performed better on a test of their knowledge and application of library skills after instruction (in relation to practical and intellectual issues in curriculum integration), however the unavailability of a control group made this finding inconclusive. The findings are discussed in relation to practical and intellectual issues in curriculum integration.

Conclusion

The outcomes of the studies and reports on the librarian's involvement in PBL reveals some interesting roles for the librarians in PBL; role in curriculum development, user education and facilitation of small groups, tutor facilitators and resource consultants.

The medical library literature demonstrates the effect of information use by students in a PBL curriculum. Rankin (1996) reviewed the literature and found PBL students used the library more often, used a wider variety of resources, showed more independence in information gathering, asked more complex reference questions, and generally acquired information skills sooner than their peers in traditional education curricula. Carolyn Gutierrez and Jianrong Wang (2001) found that "students who regularly used the library benefited the most" from literacy instruction. It reinforces the argument that research skills require practice. A single library research class as conducted traditionally is not sufficient to significantly improve these skills.

Most literature after the mid 1990s has focused on how libraries librarians can play a more active role in the PBL curriculum planning and implementation. Libraries have begun to introduce a variety and range of approaches in PBL settings. Fitzgerald, Flemming & Bayley in their description of the classic PBL implementation at the McMaster University have discussed thoroughly the library's role in the program. In a study in 1991 the university had established the fact that their students made significantly more use of the library and library resources than traditional medical school students. Among the roles played by library and its staff are: library staff are identified as people resources in the programs handbook; library is included as places identified as key resources; the library has been designed to accommodate greater usage, catering especially for PBL groups. Besides the traditional library services such as orientation, seminars for small groups of students with special needs, reference counters and

longer hours, the library has made some significant changes to support PBL. These initiatives are : librarian serves on the curriculum planning committee, a stronger voice in the planning and implementation of the medical curriculum's information management component and information resources by students; role of curriculum integration coordinator added as librarians job description; librarian as a resource person to tutorials.

Librarians have also been in the lead in IT. The evolution of print resources to electronic formats and traditional services to digital or electronic services have been an advantage to librarians. Information technology enhancement to provide students with greater variety of electronic resources, such as CD-ROM, Internet, online databases and also means of communication, were already gaining footage in libraries. The emergence of PBL may be used as a tool to accelerated the usage of such resources and services by the faculty and students at large.

PBL has evolved the role of librarians. There is a need to create a framework for the librarian to participate in PBL at various stages of its implementation. Miller (2001) proposed a framework for the roles of librarians in problem-based learning curricula. While many of these roles are described in the literature, Miller (2001) describes the librarian's role according to level of curricular involvement and includes the following levels: assistance at the reference desk; instruction at the reference desk; course-related instruction; resource management and utilization; consultation with faculty and students; and group facilitation.

While librarians know that information literacy is a requirement for survival in the information age, not all faculty fully understand yet the value of information skills. It may take a long time yet, before the library is invited to provide instruction as an integral part of the curriculum, even a PBL curriculum (Heaton & Sutherland, 1999). Education is a growing role for librarians. It is time for traditional librarians and information science curricula to change to reflect this trend. As information technology has evolved, library science schools slowly have incorporated to address the interpersonal aspects of change, which consistently have been neglected. It is important to recognize that librarians always have been educators and that this education role will continue to grow (Satterthwaite, et al., 1995). The challenge faced now is how to build library and librarians integration into the curriculum, and then to meet the demand after it is created. It is not feasible to build a library collection that answer all possible questions that might arise, at all levels of student background knowledge, and that satisfies all learning styles. In order to serve self-directed learners well, the importance of information management skills must be stressed, then balanced with other learning objectives, in particular , knowledge acquisition. Within this setting, with so many small groups, ways must be found to make the most effective use of library staff time (Fitzgerald, Flemming & Bayley ,1999).

From the literature it is evident that further research must be carried out to enable the creation of a framework for the librarian as a tutor or facilitator in PBL implementation. Studies focusing on students perception of the librarian as facilitator or resource person may provide feedback for future planning and resource development. The research agenda should be expanded to include PBL application in other disciplines besides medical and health sciences. Qualitative studies also would enable in-depth knowledge on the effectiveness of integrating information skills into the curriculum via PBL initiatives. Another useful study would be to examine the effects of librarian's involvement in PBL to their professional development since there is an increasing demand by society for professional accountability.

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