# DIGITAL REFERENCE SERVICES IN SELECTED PUBLIC ACADEMIC LIBRARIES IN MALAYSIA: A CASE STUDY

WAN A. KADIR WAN DOLLAH

*Faculty of Information Management*
*MARA University of Technology (UiTM)*
*40150 Shah Alam, Malaysia*
*E-mail:* wanab@perdana.um.edu.my

**Abstract**. Reference service is one of the library's primary services besides acquisitions, classification, cataloguing and physical planning. This service provides personalized assistance to library users in accessing and using suitable information resources to meet their needs. This research progress paper attempts to identify the status of digital reference services (DRS) in four public university libraries in Malaysia. In this study, the researcher attempts to identify usage of both traditional and digital reference services, user awareness of DRS, user satisfaction, and need for DRS. Two different sets of questionnaires were distributed: (1) a librarians' questionnaire to librarians in the four university libraries, namely, Tun Abdul Razak Library, UiTM; University of Malaya (UM) Library; Tun Seri Lanang Library, UKM; and Sultan Abdul Samad Library, UPM; (2) a users' questionnaire to students of the Faculty of Information Management, UiTM, and the Faculty of Computer Science and Information Technology, UiTM, UM and UPM. The findings show that DRS are effective forms of service delivery but their full potential has not yet been exploited. E-mail reference, Web forms and Ask-A Librarian are the main channels used in providing digital reference, although plans are under way to implement more sophisticated Internet technologies and collaborative digital reference.

## Introduction

Librarianship in the digital era combines the long-established discipline of library science with computer science and information retrieval. Computers are used to assist in a variety of functions including the provision of information and reference services. Librarians are exploring ways of assisting users in the emerging virtual communities. According to Moyo (2002), one way is to offer value-added services such as digital reference services and web-based instruction, to support remote access and navigation of library electronic resources.

## Statement of the Problem

The application of ICT is widespread in many disciplines. Wasik (2004) wrote that the dynamic nature of the Internet creates an ever-changing information environment and transforms the way information is delivered and accessed. Since a great number of users connect to the Internet (Penka, 2003), their expectation of immediate access to information and knowledge resources steadily increases. McClure, Lankes, Gross and Choltco-Devlin (2002) noted that people have become increasingly comfortable utilizing and indeed relying on digital services as part of their way of life. For instance, many people are now shopping, banking and paying their bills through various electronic and digital technologies. They also communicate with others in their personal and business lives by using e-mail or real-time services such as online chat, instant message services, and video conferencing. In the context of librarianship, users expect their libraries to provide more services online, including access to online catalogs, the ability to place requests online, access to electronic resources and the provision of some type of digital reference services.

Based on my experience as a librarian for 11 years and later as a university lecturer, most academic libraries in Malaysia have made advances in the digital era. However, the structure and organization of reference service in academic libraries have changed little since its inception. Services continue to be tied to the physical desk, requiring users to come into the library building for assistance.

Campbell (1992) observed that the model of reference focused on a physical desk could not survive in the information age. He challenged reference librarians to create a service that is 'increasingly electronic and non-building-centered'. Although much of what he envisioned has occurred, the reference desk remains at the center of reference services. Academic reference librarians should play an important role in assisting undergraduates, postgraduates, and faculty in teaching, learning and research, by offering digital reference services.

**Definitions**

The following definitions are used in this study:

   **Reference service** refers to personal assistance provided to library users seeking information (Huling, 2002), including: (1) information services that involve either finding the required information on behalf of the users, or assisting users in finding information; (2) instruction in the use of library resources and services; and (3) user guidance, in which users are guided to the most appropriate information sources and services.

   **Digital reference service** refers to a mechanism by which users can submit their questions and have them answered by a library staff member through some electronic means (e-mail, chat, Web forms, etc.), not in person or over the phone (Janes, Carter, & Memmott, 1999). It generally has the following elements: (1) the user, (2) the interface (e-mail, web form, chat, videoconference, etc.), (3) the information professional, and 4) electronic resources (including electronic or CD-based resources, web resources, local digitized materials, etc.), as well as print resources (Berube, 2003).

   **Academic libraries** in this study refer to libraries attached to academic institutions above the secondary or high school level, serving the teaching and research needs of students and staff (Feather & Sturges, 2003).

   **Case study** is a research design that entails the detailed and intensive analysis of a single case (Bryman, 2004).

**Objectives of the Study**

The objectives of the study are:
   a) To identify the existing status of digital reference services in academic libraries in Malaysia
   b) To identify the usage of such services
   c) To determine the effectiveness of such services
   d) To identify the perceived needs of such services
   e) To identify issues and problems faced by librarians and users in their use of such services
   f) To recommend solutions pertaining to digital reference services in academic libraries.

**Literature Review**

*The Role of Academic Libraries in Malaysia*

In Malaysia, academic libraries are able to provide better and more services to users compared to school libraries, special libraries and public libraries. This is because: (1) Academic libraries hold relatively larger collections as well as being better staffed and funded, (2) Most university libraries are headed by senior librarians and supported by a number of professional staff, (3) University libraries are well endowed with financial resources for collections, and (4) The academic community has pioneered the establishment and use of the Internet and Web sites (Lee & Teh, 2000).

   The public higher education institutions (IPTA) in Malaysia currently consists of 11 universities, 6 university colleges and 1 international university (Education Guide Malaysia, 2005). The public university enrolment increased from 141,059 in 1999 to 290,512 in 2003 (Malaysia. Ministry of Finance, 2004). There are also 518 private colleges, 16 private universities and 4 foreign universities' branch campuses. As at December 2003, there were 39,577 international students, mostly from the developing countries, and 314,344 local students, studying in Malaysia's private higher educational institutions ("International students: private education in Malaysia", 2005).

*Reference Service*

Together with the library, reference services have been constantly developing, from the traditional, to automated, to hybrid, and now to digital. The modern concepts of reference work can be traced to Samuel Green's 1876 paper, 'Personal relations between librarians and readers', later published in *American Library Journal* (now *Library Journal*) (Bopp & Smith, 2001). While it is doubtful that Green actually invented the idea of reference service, he was the first to speak publicly about the concept and was also the first to discuss it in writing. In both his speech to the first meeting of the American Library Association and in his article, Green discussed the need for librarians to actively assist members of their communities in using library resources. While the term 'reference' did not evolve

until several decades later (Rothstein, 1953), the publication of Green's article helped to popularized the new concept of reference service.

Green introduced four main functions of the reference librarian, which remain the basic tenets of reference service today: (1) instruct patrons how to use the library, (2) answer patron queries, (3) aid patron in selecting resources, and (4) promote the library within the community. His article noted that although catalogs and indexes are valuable, most users require instruction in their use. Users also must be guided in selecting the books that best meet their information needs. Green also highlighted the importance of human interaction in the personal assistance process, where librarians must be '*easy to get at and pleasant to talk with*' (i.e., approachable), and must mingle freely with users and help them in every way.

Numerous changes have taken place since Green's article. Nowadays, we are bringing the Internet and its interactive technologies (such as e-mail, chat, and instant messaging) to the reference desk (Penka, 2003).

### Emerging Models of Digital Reference Service (DRS)

There are two broad categories of digital reference service models. Adapting Francoeur (2002) and Berube (2003), they are:
1. *Asynchronous transactions*, where there is a time delay between the question and answer.
   a. E-mail: This is still the most used format for online information delivery. User sends the library an e-mail with a reference query, supplying whatever information he or she feels is necessary and the library replies by e-mail, telephone, fax, correspondence, etc.
   b. Web Forms: Web form transactions as found within the UK public library service, Ask A Librarian, can be initiated only from a designated web site, where users must respond to specific queries in addition to asking their questions.
   c. Ask-A services: Such services are usually corporate-sponsored web sites that allow users to ask questions and receive answers for free from public information located mainly on the World Wide Web or from proprietary databases and networks of field experts. A list of current AskA services is available at *http://www.vrd.org/locator/subject.shtml.*
2. *Synchronous transactions,* which take place in 'real-time', with an immediate response to the query.
   a. Text-based chat: Chat or Instant Messaging is where librarians and users can 'speak' to each other in real time on the Internet using special text-based software. The transaction involves a split web screen -- on one screen, the user types a question and can instantly see the librarian's response on the second screen. Librarians can call up web pages or other electronic references to search for the required information.
   b. Video-conferencing or web-cam services: This form of digital reference includes the visual element, which may be an antidote to the communications problems inherent in the more text-based services. Librarians and users are able to use both text and speech for reference transactions. Instead of a window for the textual exchange, there is a window in which librarians and users can see each other while conducting a face-to-face interview.
   c. Digital Reference Robots: The Robots essentially use artificial intelligence to respond to questions. The best known example is Ask Jeeves, available on the Internet.

The other format of digital reference services is *Collaborative digital reference services (CDRS),* where two or more libraries team up to offer reference services using any of the above formats.

## Methodology

The population in this study were:

a) Librarians in four public academic libraries in Malaysia: Tun Abdul Razak Library, UiTM; University of Malaya Library; Tun Seri Lanang Library, UKM; and Sultan Abdul Samad Library, UPM.

b) Students of the Faculty of Information Management, UiTM, and the Faculty of Computer Science and Information Technology in UiTM, UM and UPM.

Two sets of questionnaires were developed and administered: Questionnaire Set 1: Librarians' Questionnaire, and Questionnaire Set 2: Students' Questionnaire. The questionnaires were based on a series of standards developed by McClure, Lankes, Gross and Choltco-Devlin (2002) and Kasowitz, Bennett and Lankes (2000) to evaluate the quality of DRS.

**Data Analysis and Findings**

Analysis for the survey questionnaires was done using the Statistical Package for Social Sciences (SPSS) version 12.0 for Windows. The descriptive analysis has been performed to produce significant result that can be used to reflect the research objectives.

*Questionnaire Set 1: Questionnaire for Librarians*

A total of 163 questionnaires were sent to the librarians in the above four public academic libraries. 93 (57%) returned the questionnaires: 24 (25.8%) from Tun Abdul Razak Library, UiTM; 35 (37.6%) from University of Malaya Library; 15 (16.1%) from Tun Seri Lanang Library, UKM; and 19 (20.4%) from Sultan Abdul Samad Library, UPM.

 Table 1 gives the respondents' demographics and working experience, and Table 2 the frequency they were the only reference librarian on duty. The 20 (21%) who worked daily were Reference Librarians who permanently work in the Reference Service Divisions/Units, whilst the others were on a rotation basis, either on-call or on night duty.

**Table 1. Demographic Data and Working Experience**

| Demographic variable | Categories | % (Frequency) |
|---|---|---|
| Gender | Male | 25.8 (24) |
| | Female | 74.2 (69) |
| Age | Below 25 | 2.2 (2) |
| | 26-35 | 49.5 (46) |
| | 36-45 | 31.2 (29) |
| | Above 46 | 17.2 (16) |
| Position | Head of Division | 15.1 (14) |
| | Librarian | 84.9 (79) |
| Grade | S41 | 78.5 (73) |
| | S44 | 5.4 (5) |
| | S48 | 16.1 (15) |
| Highest Academic Qualification | Master's degree | 55.9 (52) |
| | Postgraduate Diploma | 6.5 (6) |
| | Bachelor's degree | 37.6 (35) |
| Working Experience as a Librarian | Below 10 years | 61.3 (57) |
| | 10-19 years | 19.4 (18) |
| | 20-29 years | 12.9 (12) |
| | Above 30 | 5.4 (5) |
| Duty as Reference Librarian | Have Experience | 73.1 (68) |
| | No Experience | 26.9 (25) |
| Working Experience as a Reference Librarian (for those 68 librarians with reference experience) | Below 3 years | 27 (18 ) |
| | 3-5 years | 29 ( 20) |
| | 6-9 years | 22 (15 ) |
| | Above 10 years | 18 (12) |
| | No response | 4(3) |

**Table 2. Frequency as the only Reference Librarian on Duty**

| | Frequency | % |
|---|---|---|
| Always (Daily) | 20 | 21 |
| Frequently (Weekly) | 14 | 15.1 |
| Sometimes (Monthly) | 38 | 40.9 |
| Rarely (A few times) | 15 | 16.1 |

Tables 3 to 7 report on various aspects of DRS use by the Reference Librarians.  In Table 4, 74% and 32% had used e-mail and Web forms (respectively) – similar to Janes' results (2002) of 78.8% and 46.6%. Most (82%) of the Reference Librarians taught themselves DRS skills, as shown in Table 8.

**Table 3.  Answering Reference Questions**

| Have you been answering reference questions using any DRS format? | Frequency | % |
|---|---|---|
| Yes | 77 | 82.8 |
| No | 16 | 17.2 |

**Table 4. Usage of DRS**

| Format of DRS used | Frequency | % |
|---|---|---|
| E-mail Reference | 69 | 74.2 |
| Web Forms | 30 | 32.3 |
| Ask-A-Librarian Service | 25 | 26.9 |
| Online Chat Reference | 1 | 1.1 |
| Collaborative DRS | 4 | 4.3 |
| Others (e.g. Virtual Research Facilitators, FAQs) | 3 | 3.2 |

**Table 5. How Long Have You Been Using DRS**

| | Frequency | % |
|---|---|---|
| More than 5 years | 27 | 29 |
| 4 years | 13 | 14 |
| 3 years | 12 | 12.9 |
| 2 years | 6 | 6.5 |
| Below 1 year | 12 | 12.9 |

**Table 6. Frequency of Using DRS**

| | Frequency | % |
|---|---|---|
| Always | 9 | 9.7 |
| Frequently | 17 | 18.3 |
| Sometimes | 35 | 37.6 |
| Rarely | 23 | 24.7 |

**Table 7. How Long Have You Been Using the Web to Answer Reference Questions**

| | Frequency | % |
|---|---|---|
| More than 5 years | 27 | 29 |
| 4 years | 11 | 11.8 |
| 3 years | 13 | 14 |
| 2 years | 7 | 7.5 |
| Less than 1 year | 11 | 11.8 |

**Table 8.  How Respondents Acquired Skills**

| Type of Training | Frequency | % |
|---|---|---|
| Continuing Education | 39 | 41.9 |
| In-service Training | 67 | 72.0 |
| Self-taught | 76 | 81.7 |
| Friends | 32 | 34.4 |
| Others | 3 | 3.2 |

*Types of Reference Questions and Subject Areas*

Table 9 lists the types of questions normally asked during DRS: the majority of the enquiries concern specific knowledge. This finding, however, contradicts a study by Chowdhury and Margariti (2004) that enquiries handled by libraries are relatively low-level.

*Benefits and Problems*

Tables 11 and 12 sought the librarians' views on the benefits and problems associated with DRS.

**Table 9. Types of Reference Questions Received**

| Type of Question | Frequency | % |
|---|---|---|
| Directional | 55 | 59.1 |
| Ready Reference | 38 | 40.9 |
| Specific Search | 64 | 68.8 |
| Research | 53 | 57 |

**Table 10. Subject Areas**

| Subject Area (Multiple Answers Possible) | Frequency | % |
|---|---|---|
| Arts and Humanities | 39 | 41.9 |
| Computers | 30 | 32.3 |
| Education | 53 | 57.0 |
| Engineering | 37 | 39.8 |
| Medical | 11 | 11.8 |
| Legal | 17 | 18.3 |
| Government | 22 | 23.7 |
| Science and Technology | 52 | 55.9 |
| Social Sciences | 72 | 77.4 |
| Others | 3 | 3.2 |

**Table 11. Benefits of DRS**

| Benefit (Multiple Answers Possible) | Frequency | % |
|---|---|---|
| Convenience | 73 | 78.5 |
| Faster Access to Information | 80 | 86.0 |
| Time saver | 73 | 78.5 |
| Cheaper than Using Telephone | 55 | 59.1 |
| Increase Motivation | 32 | 34.4 |
| More Time for Thought and Reflection | 48 | 51.6 |
| New Options for Answering Reference Questions | 66 | 71.0 |
| Providing More Complete Answers | 46 | 49.5 |
| More Personalized Services | 46 | 49.5 |
| Workload Can Be Distributed Among Staff | 43 | 46.2 |
| Questions Can Be At Any Location/Time (24/7) | 72 | 77.4 |
| Active Learning Promotion | 63 | 67.7 |
| Benefits to Particular Group of Users | 54 | 58.1 |

**Table 12. Problems in the Use of DRS**

| Problem (Multiple Answers Possible) | Frequency | % |
|---|---|---|
| Absence of Human Element | 55 | 59.1 |
| Information Overload | 41 | 44.1 |
| Staff Need to be Trained | 70 | 75.3 |
| Time Consuming | 26 | 28.0 |
| Action-oriented | 62 | 66.7 |
| No Face-to-face Interaction | 57 | 61.3 |
| Difficult to Conduct Interview | 51 | 54.8 |
| Limited Explanation | 50 | 53.8 |
| Misuse of Service | 36 | 38.7 |
| Infrastructure/System Instability | 71 | 76.3 |

***Librarians' Comments***

From the open-ended question that asked for comments and suggestions, the popular answers were as follows:

1. Many library users are ignorant about e-developments in the library.
2. Difficult to get cooperation from all professional librarians when reference/research work has been distributed, resulting in very slow response to requestor or no response at all.
3. There is no face-to-face interaction with the user, so there is no obligation to give an answer unless duties are properly assigned.

4. The librarians need support from top management.
5. System instability is the main problem, and librarians have to depend on other departments to resolve the matter.
6. Need to upgrade the system and infrastructure, for instance, use of wireless system and upgrading the server.
7. DRS is very applicable to Tun Abdul Razak Library, UiTM, where the student population is huge.
8. The DRS provided by Tun Abdul Razak Library, UiTM, known as Virtual Research Facilities (VRF), is available to registered users only. Although this service has been promoted, usage has been fairly low.
9. There is still room for improvement of the services.
10. Easier said than done.

### *Questionnaire Set 2: Questionnaire for Students*

A total of 500 questionnaires were randomly distributed to students of the Faculty of Information Management, UiTM, and the Faculty of Computer Science and Information Technology in UiTM, UM and UPM. 406 (81.2%) questionnaires were returned: 190 (46.8%) from the Faculty of Information Management and the Faculty of Information Technology and Quantitative Sciences, UiTM; 125 (30.8%) from the Faculty of Computer Science and Information Technology, UM; and 91 (22.4%) from the Faculty of Computer Science and Information Technology, UPM. Table 13 gives the students' demographics. Tables 14 to 17 summarize the students' use of the Internet. Table 18 tabulates the students' responses when asked to comment on whether computer literacy was important in the usage of electronic resources/services.

**Table 13. Demographic Data of Students**

| Demographic variable | Categories | % (Frequency) |
|---|---|---|
| Gender | Male | 34 (137) |
| | Female | 66 (269) |
| Age | Below 20 | 26.8 (109) |
| | 20-22 | 51 (207) |
| | 23-25 | 17.7 (72) |
| | Above 26 | 4.4 (18) |
| Student Level | Undergraduate | 87.9 (357) |
| | Postgraduate | 12.1 (49) |
| Semester | Semester 2 | 7.4 (30) |
| | Semester 3 | 31.0 (126) |
| | Semester 4 | 25.4 (103) |
| | Semester 5 | 9.1 (37) |
| | Semester 6 | 11.3 (46) |
| | Semester 7 | 7.6 (31) |
| | Semester 8 | 2.7 (11) |
| Currently Living | On Campus | 58.9 (239) |
| | Outside | 39.2 (159) |
| Mode of Study | Full Time | 76.4 (310) |
| | Part Time | 17.7 (72) |

**Table 14. Internet Use (405 responses)**

| | Frequency | % |
|---|---|---|
| Always | 285 | 70.2 |
| Frequently | 95 | 23.4 |
| Sometimes | 18 | 4.4 |
| Rarely | 7 | 1.7 |

**Table 15. Average Time Using Internet**

|  | Frequency | % |
|---|---|---|
| Less than 3 hours | 116 | 28.6 |
| 4-6 hours | 115 | 28.3 |
| 7-9 hours | 52 | 12.8 |
| More than 10 hours | 116 | 28.6 |

**Table 16. Purpose of Accessing Internet**

|  | Frequency | % |
|---|---|---|
| Communication | 302 | 74.4 |
| Education | 356 | 87.7 |
| Viewing Current News | 240 | 59.1 |
| Business | 49 | 12.1 |
| Entertainment | 299 | 73.6 |
| Research | 282 | 69.5 |
| Others | 23 | 5.7 |

**Table 17. How They Acquired the Skills to Use Internet**

|  | Frequency | % |
|---|---|---|
| Self-taught | 349 | 86 |
| Training | 64 | 15.8 |
| Friends | 260 | 64 |
| Teachers/Lecturers | 147 | 36.2 |
| Information Literacy Skills | 96 | 23.6 |
| Others | 19 | 4.7 |

**Table 18. The Importance of Computer Literacy**

|  | Frequency | % |
|---|---|---|
| Strongly Agree | 142 | 35 |
| Agree | 189 | 46.6 |
| Somewhat Agree | 37 | 9.1 |
| Disagree | 2 | 0.5 |
| Strongly Disagree | 14 | 3.4 |

*Awareness of DRS*

Tables 19 and 20 cover the students' interaction with the library and its electronic resources, while Tables 21 to 23 ask them about their awareness of its website and DRS. The results of Table 20 are similar to that of Foley (2002), who found that 69% of the respondents were on-campus when they sent enquiries through DRS. However, Table 22 contradicts Johnson (2004), who found that awareness of DRS was low.

**Table 19. How Often Do You Physically Visit the Library**

|  | Frequency | % |
|---|---|---|
| Always | 45 | 11.1 |
| Frequently | 81 | 20.0 |
| Sometimes | 124 | 30.5 |
| Rarely | 108 | 26.6 |
| Never | 34 | 8.4 |

**Table 20. Where Do You Access Library's Electronic Resources**

|  | Frequency | % |
|---|---|---|
| Library | 251 | 61.8 |
| Campus hostel | 96 | 23.6 |
| Faculty | 193 | 47.5 |
| Home | 110 | 27.1 |
| Others | 47 | 11.6 |

**Table 21. Awareness of Library Website**

|  | Frequency | % |
|---|---|---|
| Yes | 309 | 76.1 |
| No | 82 | 20.2 |

**Table 22. Awareness of DRS**

|  | Frequency | % |
|---|---|---|
| Yes | 297 | 73.2 |
| No | 94 | 23.2 |

**Table 23. How Do You Know About DRS**

|  | Frequency | % |
|---|---|---|
| Found it on the Library Web site | 217 | 53.4 |
| Friends | 156 | 38.4 |
| E-Mail | 39 | 9.6 |
| Information Literacy Skills | 61 | 15.0 |
| Library Promotion | 89 | 21.9 |
| Others | 16 | 3.9 |

*Usage of DRS*

Tables 24 to 28 probe student use of DRS and other forms of reference service. Regarding Table 24, Johnson (2004) also found that the survey respondents reported prior use of face-to-face reference and a desire to use this service first when pursuing research topics.

**Table 24. Usage of DRS**

| Reference Services/DRS | Frequency | % |
|---|---|---|
| Face-to-face consultation | 259 | 63.8 |
| Telephone consultation | 53 | 13.1 |
| Correspondence | 27 | 6.7 |
| E-Mail Reference | 117 | 28.8 |
| Web form | 173 | 42.6 |
| Ask-A Librarian | 160 | 39.4 |
| Online Chat Reference | 24 | 5.9 |
| Others | 8 | 2.0 |

**Table 25. Frequency of Use of DRS**

|  | Frequency | % |
|---|---|---|
| Always | 19 | 4.7 |
| Frequently | 54 | 13.3 |
| Sometimes | 116 | 28.6 |
| Rarely | 137 | 33.7 |
| Never | 63 | 15.5 |

**Table 26. Time of Use of DRS**

|  | Frequency | % |
|---|---|---|
| 12.00 am – 6.00 am | 29 | 7.1 |
| 6.00 am – 12.00 noon | 37 | 9.1 |
| 12.00 – 6.00 pm | 95 | 23.4 |
| 6.00 pm – 12.00 midnight | 52 | 12.8 |
| Not sure | 171 | 42.1 |

**Table 27. Rate Value/Importance of DRS**

| Format of DRS | Very Important | Important | Somewhat Important | Not Important | Not Important at All |
|---|---|---|---|---|---|
| E-Mail Ref | 106(26.1%) | 189(46.6%) | 66(16.3%) | 6(1.5%) | 3(0.7%) |
| Web Forms | 98(24.1%) | 200(49.3%) | 73(18%) | 2 (0.5%) | 2(0.5%) |
| AskA Librarian | 89(21.9%) | 173(42.6%) | 97(23.9%) | 10(2.5%) | 6(1.5%) |
| Online Chat | 47(11.6%) | 145(35.7%) | 124(30.5%) | 27(6.7%) | 9(2.2%) |

**Table 28. Do Not Use the Service**

| Reason for non-use | Frequency | % |
|---|---|---|
| Do not need it | 78 | 19.2 |
| Not Interested | 71 | 17.5 |
| Don't Know How to Use | 68 | 16.7 |
| Complicated | 61 | 15.0 |
| Others | 15 | 3.7 |

***Students' Perceptions of DRS***

Tables 29 to 31 present the students' perceptions in terms of quality of service, usability and access time. From Table 32, it can be seen that students were very satisfied, satisfied or somewhat satisfied with the DRS provided by the libraries. Table 33 shows that most of the students agree that the libraries have provided sufficient access to electronic resources, information literacy skills programmes, as well as guidance and training on how to use DRS. In Table 34, students were asked their preferred format or option of assistance. Table 35 records the students' replies when asked to predict the most heavily used format of reference service over the next five years. Table 36 asked students to give their perception to describe the future when technology makes more information accessible.

***Benefits and Problems***

Tables 37 and 38 reflect the students' opinions on the benefits and problems associated with DRS.

**Table 29. Quality of Service**

| | Frequency | % |
|---|---|---|
| Very High quality | 20 | 4.9 |
| High quality | 142 | 35.0 |
| Somewhat High Quality | 205 | 50.5 |
| Poor quality | 14 | 3.4 |
| Very poor | 2 | 0.5 |

**Table 30. Usability of DRS**

| | Frequency | % |
|---|---|---|
| Very Easy | 22 | 5.4 |
| Easy | 140 | 34.5 |
| Somewhat easy | 200 | 49.3 |
| Difficult | 20 | 4.9 |
| Very Difficult | 3 | 0.7 |

**Table 31. Typical Access Time**

| | Frequency | % |
|---|---|---|
| Very Fast | 16 | 3.9 |
| Fast | 99 | 24.4 |
| Somewhat Fast | 219 | 53.9 |
| Slow | 50 | 12.3 |
| Very Slow | 22 | 5.4 |

**Table 32. User Satisfaction with DRS**

|  | Very Satisfied | Satisfied | Somewhat Satisfied | Dissatisfied | Very Dis-satisfied |
|---|---|---|---|---|---|
| Access to Information Resources | 27 (6.7%) | 158(38.9%) | 137(33.7%) | 16(3.9%) | 2(0.5%) |
| Availability of Resources | 25 (6.2%) | 158(38.9%) | 135(33.3%) | 17(4.2%) | 3(0.7%) |
| Accuracy | 23 (5.7%) | 140(34.5%) | 162(39.9%) | 12(3.0%) | 0(0%) |
| Current Information | 33 (8.1%) | 156(38.4%) | 135(33.3%) | 11(2.7%) | 0(0%) |
| Response Time | 17 (4.2%) | 136(33.5%) | 149(36.7%) | 32(7.9%) | 1(0.2%) |
| Answer Given | 17 (4.2%) | 137(33.7%) | 154(37.9%) | 22(5.4%) | 1(0.2%) |
| Efficiency of library staff/librarian | 24 (5.9%) | 164(40.4%) | 129(31.8%) | 16(3.9%) | 4(1.0%) |
| Knowledge of library staff/librarian | 25 (6.2%) | 164(40.4%) | 127(31.3%) | 14(3.4%) | 1(0.2%) |
| Courtesy of library staff/librarian | 18 (4.4%) | 144(35.5%) | 152(37.4%) | 13(3.2%) | 1(0.2%) |
| Cooperation of library staff/librarian | 22 (5.4%) | 158(38.9%) | 136(33.5%) | 16(3.9%) | 3(0.7%) |

**Table 33. Library's Performance**

|  | Strongly Agree | Agree | Somewhat Agree | Disagree | Strongly Disagree |
|---|---|---|---|---|---|
| Library provides sufficient access to electronic resources | 31(7.6%) | 226(55.7%) | 115(28.3%) | 13(3.2%) | 5(1.2%) |
| Librarians offer sufficient information literacy skills | 24(5.9%) | 159(39.2%) | 170(41.9%) | 31(7.6%) | 4(1.0%) |
| Library provides sufficient guidance and training | 24(5.9%) | 148(36.5%) | 163(40.1%) | 44(10.8%) | 8(2.0%) |

**Table 34. Options for Assistance**

|  | Frequency | % |
|---|---|---|
| Face-to-face Consultation | 259 | 63.8 |
| Telephone Consultation | 34 | 8.4 |
| E-Mail Reference | 123 | 30.3 |
| Online Chat Reference | 49 | 12.1 |
| Others | 14 | 3.4 |

**Table 35. Most Heavily Used Format of Reference Service in Five Years**

|  | Frequency | % |
|---|---|---|
| Face-to-face Consultation | 106 | 26.1 |
| Telephone Consultation | 56 | 13.8 |
| E-Mail Reference | 170 | 41.9 |
| Online Chat Reference | 178 | 43.8 |
| Video Conferencing | 160 | 39.4 |
| Others | 19 | 4.7 |

**Table 36. Best Describe the Future**

| Statement | Frequency | % |
|---|---|---|
| As technology makes more information accessible, people will need less human help in doing research | 287 | 70.7 |
| As technology makes more information accessible, people will need more human help in doing research | 81 | 20.0 |
| No human help at all | 19 | 4.7 |

**Table 37. Benefits of DRS**

| Benefit (Multiple Answers Possible) | Frequency | % |
|---|---|---|
| Convenience | 300 | 73.9 |
| Faster Access | 327 | 80.5 |
| Time saver | 303 | 74.6 |
| Cheaper than using telephone | 215 | 53.0 |
| Increase Motivation | 91 | 22.4 |
| More Time for Thought and reflection | 105 | 25.9 |
| New Options for answering reference | 143 | 35.2 |
| Providing More Complete Answers | 144 | 35.5 |
| More Personalized Services | 145 | 35.7 |
| Can be submitted at any location/time(24/7) | 196 | 48.3 |
| Active Learning Promotion | 157 | 38.7 |
| Benefits to Particular Users | 147 | 36.2 |
| Others | 3 | 0.7 |

**Table 38. Problems in the Use of DRS**

| Problem (Multiple Answers Possible) | Frequency | % |
|---|---|---|
| Absence of Human Element | 180 | 44.3 |
| Information Overload | 188 | 46.3 |
| Time Consuming | 131 | 32.3 |
| No Face-to-face Interaction | 182 | 44.8 |
| Limited Explanation | 219 | 53.9 |
| Misuse of Service | 172 | 42.4 |
| Infrastructure/System Instability | 153 | 37.7 |
| Others | 9 | 2.2 |

## Summary of Significant Findings

1. All the four public academic libraries in the study have implemented digital reference services (DRS). They provide an interface that allows the user to place queries electronically through a Web Form, via a 'Contact Us' or 'Ask Us' link in the main menu. They have also implemented at least e-mail reference and Web forms. Tun Abdul Razak Library in UiTM has a service called *Virtual Reference Facilities* (VRF) and Sultan Abdul Samad Library in UPM has Distance Learning Services that offer DRS.

2. A high percentage of librarians and students have been using DRS. 74.2% of the librarians have used E-Mail reference, 32.3% web forms and 26.9% Ask-a Librarian. 28.8% of the students in this study have used E-Mail reference, 42.6 % Web Forms and 39.4% Ask-A Librarian Services.

3. The study noted a number of benefits of DRS for librarians and students. This is in line with Johnson, Newton and Reid (2004), who mentioned that using digital reference services could be a time saver for users, and using the Internet is generally cheaper than using a telephone. Digital reference services provide an extra choice for users, and may take some of the load off a busy reference desk, although it does not lessen the overall workload for the library. Lam (2003) pointed out that e-mail reference offers users the convenience of asking for information or reference assistance whenever and wherever they are, as long as the Internet is accessible. Accessible 24-hours a day and unrestricted by geography, DRS is a powerful means for the free exchange of information and the promotion of interactive learning, where the learning or teaching situation is characterized by participation on the part of the learner. E-mail reference also has the advantage of providing more complete answers than what can be given at a busy reference desk. When answering a question

through e-mail, the reference librarian usually has more time to think about the question, the user's information need, and if necessary, consult other librarians. With chat technologies, users can access information and receive real time guidance from librarians. Instant messaging software products such as AOL allow librarians to communicate synchronously in the shared environment.

A more detailed study of DRS in academic libraries should be conducted, to include other public universities, private universities and colleges. Future research should also include university populations from other faculties.

## Recommendations

Based on the research findings, some recommendations for the future improvement of DRS in academic libraries in Malaysia are listed below.

1. Librarians need to be properly trained, in order to acquire skills to operate various formats of digital reference services. They also need to be trained in interview techniques, communication skills, organization of information as well as other aspects of knowledge, so that they will be able to provide standard answers/information to users. This will lead to an improvement in the quality of service. Librarians also need to read widely so that they can answer questions posed to them.
2. There is a need to promote DRS so that more users will know about the service. Librarians also need to explain the benefits of using DRS to users. Users should be thoroughly trained in order to reap the full benefits of DRS.
3. There is a need to educate users to ask serious reference questions, instead of simple frivolous enquiries that they can answer themselves with knowledge of library use.
4. Academic libraries in Malaysia should use the latest formats of digital reference services, such as online chat reference, video conferencing and collaborative DRS. In connection with this, librarians should acquire ICT skills and keep up with new technologies and developments in the library arena. The libraries should upgrade their systems and infrastructure, for instance, upgrading the server and using wireless systems.
5. The libraries should stabilize the system and infrastructure of the services. There is a need to recruit their own IT staff so that they can resolve technical problems without depending on others.
6. The libraries should provide more funds to enhance the facilities of DRS.
7. There should be proper sub-division of reference duties so that enquiries will not go unanswered. Reference work and information literacy skills instruction should be carried out by different librarians. This is to avoid too heavy a workload and stress among staff.
8. Although DRS is associated with a 24/7 service model, this level of service is often impossible for a single library to implement (Berube, 2003). Therefore, all the academic libraries in Malaysia should co-operate with one another to offer digital reference services. Collaborative DRS provides many benefits, such as allowing individual institutions to share expertise and resources, expanding hours of service, and providing access to a larger collection of knowledge resulting from digital reference services (e.g., question-answer archives).

## Acknowledgements

## References

Berube, L. (2003). *Digital reference overview: an issue paper from the Networked Services Policy Task Group*. Retrieved May 14, 2004, from *http://www.ukoln.ac.uk/public/nsptg/virtual/*

Bopp, R. E., & Smith, L. C. (Eds.) (2001). *Reference and information services: an Introduction* (3rd ed.). Colorado: Libraries Unlimited, Inc.

Bryman, A. (2004). *Social research method* (2nd ed.). Oxford: OUP.

Bunge, C. A. (1999). Reference services. *Reference Librarian*, *66,* 185-199.

Bunge, C. A., & Bopp, R. E. (2001). History and varieties of reference services. In Bopp, R. E., & Smith, L. C. (Eds.), *Reference and information services: an introduction* (3rd ed.) (pp. 3-27). Colorado: Libraries Unlimited, Inc.

Burke, L. (2003). The future role of librarians in the virtual library environment. *The Australian Library Journal, 51*(1), 1-16.

Campbell, J. D. (1992). Shaking the conceptual foundations of reference: a perspective. *Reference Services Review*, *20*, 29-36.

Chowdhury, G. G., & Chowdhury, S. (2003). *Introduction to digital libraries.* London: Facet Publishing.

Chowdhury, G., & Margariti, S. (2004). Digital reference services: a snapshot of the current practices in Scottish libraries. *Library Review*, *53*(1), 50-60.

*Education guide Malaysia: your one-stop resource guide to Malaysian education* (10th ed.). (2005). Petaling Jaya: Challenger Concept.

Feather, J., & Sturges, P. (Eds.) (2003). *International encyclopedia of information and library science* (2nd ed.). London: Routledge.

Francoeur, S. (2002). Digital Reference. In *The Teaching Librarian.* Retrieved July 27, 2004. from *http://www.teachinglibrarian.org/digref.htm*

Gorman, G. E. (Ed.) (2002). *The digital factor in library and information services.* London: Facet Publishing.

Gray, S. M. (2000). Virtual reference services: directions and agendas. *Reference and User Services Quarterly*, *39*(4), 365-375.

Grohs, K., Reed, C., & Allen, N. (2003). Marketing the virtual library. In Hanson, A., & Levin, B. L. *Building a virtual library.* London: Information Science Publishing.

Gross, M., McClure, C. R., & Lankes, R. D. (2001). *Assessing quality in digital reference services*: overview of key literature on digital reference. Florida: Information Institute.

Han, L., & Goulding, A. (2003). Information and reference services in the digital library. *Information Services and Use*, *23*, 251-262.

Huling, N. (2002). Reference services and information access. In Schement, J. R. (Ed.), *Encyclopedia of communication and information* (pp. 867 874). New York: Gale.

*International students: private education in Malaysia*. Retrieved January 17, 2005, from *http://www.studymalaysia.com/is/education12.shtml*

Janes, J., Carter, D., & Memmott, P. (1999). Digital reference services in academic libraries. *Reference and User Services Quarterly, 39*(2), 145-150.

Janes, J. (2002). *What is reference for?* Retrieved June, 2004, from *http://www.ala.org/ala/rusa/rusaprotools/futureofref/whatreference.htm*

Kasowitz, A. S. (2001). *Trends and issues in digital reference services. ERIC Digest*, November:

Lankes, R. D. et. al. (Eds.). (2003). *Implementing digital reference services: setting standards and make it real*. London: Facet Publishing.

Lankes, R. D., Collins, J. W., & Kasowitz, A. S. (Eds) (2000). *Digital reference service in the new millennium: planning, management and evolution.* New York: Neal Schuman.

Lee, K. H., & Teh, K. H. (2000). Evaluation of academic library web sites in Malaysia. *Malaysian Journal of Library and Information Science, 5*(2), 95-108.

Lipow, A. G. (1998). Reference service in a digital age. *Reference and User Services Quarterly*, *38*, 47-81.

Malaysia. Ministry of Finance. (2004). *Economic report 2004/2005*. Kuala Lumpur: Percetakan Nasional.

McClennen, M. (2002). Software, systems and standards in digital reference: a research agenda. Retrieved November 19, 2002, from *http://www.ipl.org/div/papers/symposium-2002/systems.html*

McClennen, M., & Memmot, P. (2001). Roles in digital reference. *Information Technology and Libraries*, *20*(3), 143-148.

McClure, C. R., Lankes, R. D., Gross, M., & Choltco-Devlin, B. (2002). *Statistics, measures and quality standards for assessing digital reference library services: guidelines and procedures.* Draft version. Syracuse, NY: Syracuse University.

McClure, C. R., & Lankes, R. D. (2001). Assessing quality in digital reference services: a research prospectus. Retrieved May 10, 2004, from *http://quartz.syr.edu/quality/Overview.htm*

Moyo, L. M. (2002). Reference anytime anywhere: towards virtual reference services at Penn state. *The Electronic Library*, *20*(1), 22-28.

Penka, J. T. ((2003). The technological challenges of digital reference: an overview. *D-Lib Magazine*, *9*(2). Retrieved May 14, 2004, from *http://www.dlib.org/dlib/february03/penka/02penka.html*

Pomerantz, J., Nicholson, S., & Lankes, R. D. (2003) Digital reference triage: factors influencing question routing and assignment. *The Library Quarterly, 73*(2), 103-120.

Pomerantz, J. et. al. (2004). The current state of digital reference: validation of a general digital reference model through a survey of digital reference services. *Information Processing and Management*, *40*, 47-363.

Rothstein, S. (1961). Reference services: the new dimension in librarianship. *College and Research Libraries*, *22*,11-18.

Singh, Diljit (2004). *Reference services in the digital age*. Paper presented at the Conference on Library Management in the 21st Century at Ateneo de Manila University, Philippines, 29-30 March, 2004.

Tenopir, C., & Ennis, L. (2002). A decade of digital reference 1991-2001. *Reference and User Service Quarterly*. *41*(3), 264-273.

Wasik, J. M. (2004). *Building and maintaining digital reference services*. Retrieved January 20, 2004, from *http://www.michaellorenzen.com/eric/ref-serv.html*