

Information Literacy Skills of Undergraduates of University of Moratuwa

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Abstract

Information literacy has been recognized as one of the core literacies of the 21st century. An information literate person is capable of identifying, locating, evaluating, organizing, and effectively using the information to address and help resolve personal, job related, or broader social issues and problems. This research was conducted to investigate the status of information literacy skills of the undergraduates of University of Moratuwa. Surveyed a stratified random sample of 918 undergraduates. The findings and implications of the research have been discussed

Keywords: Information Literacy, Information Skills, Library Instruction

1. Introduction and objectives

Information literacy is “a set of abilities requiring individuals to recognize when information is needed and have the ability to define, locate, evaluate and use effectively the needed information” (Association of College and Research Libraries, 2000). Hence, people are considered to be information literate when they are able to identify, locate, evaluate, organize, and effectively use information to address and help resolve personal, job related, or broader social issues and problems (Catts, 2005; Catts and Lau, 2008). American Library Association Presidential Committee on information literacy says “ultimately, information literate people are those who have learned how to learn. They know how to learn because they know how knowledge is organised, how to find information and how to use information in such a way

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that others can learn from them. They are people prepared for lifelong learning, because they can always find information needed for any task or decision at hand” (American Library Association, 1989). Hence, information literacy is the foundation for lifelong learning. “It is common to all disciplines, to all learning environments, and to all levels of education. It enables learners to master content and extend their investigations, become self-directed, and to assume greater control over their own learning” (Association of College and Research Libraries, 2000).

When undergraduates passing out from universities are seen as tomorrow’s workers, all undergraduates have to be information literate and such people become valuable assets to any employer. At present, undergraduates simply cannot cope with the huge amounts of information available. On the other hand, undergraduates are faced with different styles of learning and assimilating. Information literate undergraduates will have the skills in finding information for any purpose. Information literacy education and training have become vital in this environment.

University libraries offer education and training on information literacy to undergraduates without assessing their information literacy skill levels at the commencement of degree programmes. If the initial level of information literacy skills of newly entered undergraduates were known, education and training could be designed to overcome student weaknesses (Thirion and Pochet, 2009). Therefore, there is a need to evaluate information literacy skills of undergraduates in designing library instructional programmes. Information literacy skills are usually assessed using three distinct methodologies: self-evaluation that allows the assessment of skills at a particular point of time; third-party evaluation that allows the assessment of an individual’s learning/acquisition of skills; and peer evaluation that allows the evaluation of the possession of skills as perceived by peers (Camuffo and Gerli 2004; Graham and Tarbell 2006; Marsh, 1984).

Although few attempts have been made in Sri Lanka to identify information literacy of undergraduates (e.g. Jayatissa, 2009), no study has been undertaken, to date, to investigate information literacy of undergraduates

based on a proper framework with a university-wide coverage. Therefore, the objective of this study is to assess information literacy skills of undergraduates using a test.

2. Methodology

Information literacy skills were assessed using third-party evaluation (by the two authors) methods proposed in literature.

2.1. Measures

a) Information literacy skills based on MCQ test items

The information literacy skills of undergraduates were assessed using 25 multiple choice questions (MCQs) developed for the study. In doing so, four information literacy competency standards for higher education developed by Association of College and Research Libraries, USA (ACRL, 2000) were adopted. Eight information literacy skills for these standards were adopted from Project SAILS (2009). A matrix of skills and standards corresponding to these 25 MCQs are shown in Table 1.

Table 1- Matrix of skills and standards: MCQ items

Skill	ACRL Standard	Determine the nature and extent of information needed	Access required information effectively and efficiently	Evaluate information and its sources	Understand many of the economic, legal and social issues
Developing a research strategy (Skill1)		1, 3	2	-	-
Selecting and finding tools (Skill2)		5	4, 6	7	-
Searching (Skill3)		-	8, 9, 25	-	-
Using finding tool features (Skill4)		-	10, 11, 12	-	-
Retrieving sources (Skill5)		-	13, 14, 15	-	-
Evaluating sources (Skill6)		-	-	16, 17, 18	-
Documenting sources (Skill7)		-	19	-	20, 21
Understanding of economic, legal and social issues (Skill8)		-	-	-	22, 23, 24

As shown in Table 1, Skill1 assesses the ability in defining and articulating the need for information. Skill2 assesses the ability in identifying variety of types and formats of potential information sources, and costs and benefits of acquiring the needed information. Skill3 assesses the ability in accessing the needed information effectively and efficiently using different search strategies. Skill4 assesses the knowledge on characteristics and features of different information sources. Skill5 assesses the ways and means of retrieving information online or in person using variety of methods according to the characteristics and features of information sources. Skill6 assesses ability of evaluating information and its sources, and incorporating selected information into his/her knowledge base and value system. Skill7 assesses knowledge and experience on acknowledging information sources using appropriate documentation style. Skill8 assesses economic, legal and social issues surrounding the use of information.

b) Demographic Characteristics

Demographic characteristics, namely, Z Score in the A/L examination and district, age, gender, ethnicity, religion and some socio-economic details relevant to scope of study such as mother's employment, influence of relatives (grandparents etc.) living with them investigated.

2.2. Method of sample selection

A random sample of level 1 undergraduates representing Faculties of Architecture, Engineering, and Information Technology (Batch 08) were selected. To assess information literacy skills across academic years, random samples of Level 2 (Batch 07) and Level 4 undergraduates (Batch 05) representing Faculty of Engineering were also selected.

2.3. Method of data collection

Data was collected from March 2009 to April 2009. The majority of students responded to the questionnaire in a classroom setting.

2.4. Method of data analysis

Data was analyzed using "Statistical Package for Social Sciences" (SPSS Inc. Chicago, IL, USA). In assessing 25 MCQs, each correct answer was given 1.0

mark, partly-correct answer was given 0.5, and wrong answer was given 0.0 (zero). The marks obtained for each MCQ was averaged to arrive at a mean score for each skill and an overall mean score for overall information literacy skills.

2. Results:

3.1 Response rate

Table 2 shows the details of population and sample of the study. 918 valid responses were received at a overall representation rate of 38%.

Table 2- Population and sample

Batch, Level and Faculty	Population	Sample (Responses received)	% Represented
08 Level 1 Faculty of Architecture (Arch. L1)	291	122	42
08 Level 1 Faculty of Information Technology (IT L1)	98	39	40
08 Level 1 Faculty of Engineering (Eng. L1)*	706	409	58
07 Level 2 Faculty of Engineering (Eng. L2)*	731	159	22
05 Level 4 Faculty of Engineering (Eng. L4)†	588	189	32
Total	2414	918	38

Note: * Includes B.Sc. in Transport & Logistics Management. Does not include B. Design in Fashion Design & Product Development.

† Does not include B.Sc. in Transport & Logistics Management and B. Design in Fashion Design & Product Development.

3.2 Respondents' demographic characteristics

Respondents' demographic characteristics are described in terms of their Z Score in the A/L examination, age, gender, ethnicity, religion and some socio-economic details in Table 3.

Table 3 - Characteristics of the respondents

	Faculty				
	Arch. L 1 (n=122)	IT L 1 (n=39)	Eng.		
			L1 (n=409)	L2 (n=159)	L4 (n=189)
Z Score in the A/L examination:					
Mean	2.5	1.6	2.2	2.1	2.2
Std. Deviation	0.9	0.3	0.4	0.4	0.36
Age:					
Mean	20.75	21.29	20.92	21.90	23.80
Std. Deviation	0.72	0.76	1.24	0.76	0.68
Gender (%):					
Male	45.8	62.9	71.7	76.4	84.0
Female	54.2	37.1	28.3	23.6	16.0
Ethnicity (%):					
Sinhala	89.0	85.3	90.1	91.8	77.6
Tamil	9.3	11.8	7.3	6.2	16.1
Muslim/Moor	0.8	2.9	2.6	2.1	5.2
Other	0.8	-	-	-	1.1
Religion (%):					
Buddhist	83.1	85.3	83.1	82.3	69.9
Hinduism	6.8	11.8	6.5	4.8	14.5
Christian	9.3	-	7.5	10.2	9.2
Islam	0.8	2.9	2.3	2.0	5.8
Other	-	-	0.5	0.7	0.6
Influence of grandparents or any other relatives living (%):					
No	53.0	51.4	48.1	53.8	52.3
Yes	47.0	48.6	51.9	46.2	47.7
Mother in a paid employment/housewife (%):					
Housewife	65.8	60.0	55.4	51.0	59.6
In paid employment	34.2	40.0	44.6	49.0	40.4

Table 4 shows administrative provinces from which undergraduates represented in the sample entered the university.

Table 4 - Provinces- undergraduates represented in the sample entered the university (%)

Province	Faculty				
	Arch.	IT	Eng.		
	L 1 (n=122)	L 1 (n=39)	L1 (n=409)	L2 (n=159)	L4 (n=189)
Western	32	37	61	54	61
Central	18	9	2	8	5
Southern	13	12	16	16	15
North Western	10	9	8	7	5
Sabaragamuwa	8	12	3	5	2
North Central	5	6	3	1	2
Uva	5	9	1	3	1
Eastern	5	3	1	1	2
Northern	4	3	5	5	7
	100	100	100	100	100

3.3 Information literacy skills based on MCQ test results

Table 5 and 6 presents findings related to the evaluation of information literacy skills based on MCQ test results. Matrix of eight skills and four standards across Faculties are shown in Table 5. Scores are placed on a scale ranging from 0 to 1. and SD range: 0.14 to 0.39. Table 6 shows the level of each information literacy skill across Faculties. Scores are placed on a scale ranging from 0 to 1000 with standard error.

According to Table 6, highest mean scores were obtained for Skill4 – Using, finding tool features by undergraduates from Faculty of Architecture and Faculty of IT. Undergraduates from Faculty of Engineering across all the three Levels obtained the highest mean score for Skill5 – Retrieving sources. The lowest two mean scores were obtained for Skill 2 – Selecting and finding tools and Skill 8 – Understanding of economic, legal and social issues of information by undergraduates from all the three Faculties. This indicates undergraduates' difficulties irrespective of the discipline in identifying variety of types and formats of potential information sources as well as assessing economic, legal and social issues surrounding the use of information.

Table 5 - Matrix of information literacy skills- Mean values

Standard \ Skill	Determine the nature and extent of information needed	Access required information effectively and efficiently	Evaluate information and its sources	Understand many of the economic, legal and social issues
Developing a research strategy (Skill1)	Arch. L 1 = 0.31 IT L 1 = 0.31 Eng. L 1 = 0.32 Eng. L 2 = 0.33 Eng. L 4 = 0.33	Arch. L 1 = 0.54 IT L 1 = 0.48 Eng. L 1 = 0.49 Eng. L 2 = 0.51 Eng. L 4 = 0.50		
Selecting and finding tools (Skill2)	Arch. L 1 = 0.06 IT L 1 = 0.18 Eng. L 1 = 0.34 Eng. L 2 = 0.26 Eng. L 4 = 0.21	Arch. L 1 = 0.36 IT L 1 = 0.27 Eng. L 1 = 0.28 Eng. L 2 = 0.29 Eng. L 4 = 0.29	Arch. L = 0.17 IT L 1 = 0.12 Eng. L 1 = 0.18 Eng. L 2 = 0.24 Eng. L 4 = 0.28	
Searching (Skill3)		Arch. L 1 = 0.55 IT L 1 = 0.33 Eng. L 1 = 0.41 Eng. L 2 = 0.56 Eng. L 4 = 0.55		
Using finding tool features (Skill4)		Arch. L 1 = 0.52 IT L 1 = 0.49 Eng. L 1 = 0.45 Eng. L 2 = 0.58 Eng. L 4 = 0.57		
Retrieving sources (Skill5)		Arch. L 1 = 0.42 IT L 1 = 0.43 Eng. L 1 = 0.53 Eng. L 2 = 0.65 Eng. L 4 = 0.64		
Evaluating sources (Skill6)			Arch. L 1 = 0.41 IT L 1 = 0.38 Eng. L 1 = 0.32 Eng. L 2 = 0.37 Eng. L 4 = 0.57	
Documenting sources (Skill7)		Arch. L 1 = 0.52 IT L 1 = 0.24 Eng. L 1 = 0.31 Eng. L 2 = 0.34 Eng. L 4 = 0.39		Arch. L 1 = 0.43 IT L 1 = 0.40 Eng. L 1 = 0.41 Eng. L 2 = 0.39 Eng. L 4 = 0.47
Understanding of economic, legal and social issues (Skill8)				Arch. L 1 = 0.30 IT L 1 = 0.25 Eng. L 1 = 0.23 Eng. L 2 = 0.27 Eng. L 4 = 0.28

However, it should be noted that information literacy is discipline specific (Catts, 2005). Therefore, direct comparisons across Faculties are not recommended.

Table 6 - Information literacy skills

	Faculty				
	Arch. L 1	IT L 1	Eng.		
			L1	L2	L4
Developing a research strategy (Skill1)	381± 10	370± 26	371± 6	388± 9	389 ± 9
Selecting and finding tools (Skill2)	256± 24	250± 39	301± 12	279± 22	261 ± 20
Searching (Skill3)	459± 26	281± 54	348± 15	457± 21	479 ± 21
Using finding tool features (Skill4)	522± 31	490± 52	450± 15	582± 20	576 ± 21
Retrieving sources (Skill5)	418± 24	434± 47	526± 18	653± 24	647 ± 20
Evaluating sources (Skill6)	409± 20	375± 39	316± 11	368± 20	409 ± 30
Documenting sources (Skill7)	461± 19	338± 37	379± 11	412± 20	448 ± 19
Understanding of economic, legal and social issues (Skill8)	303± 24	250± 61	231± 13	265± 20	287 ± 24

Table 7- Information literacy skills - foreign universities

Skill	University of Connecticut (USA)	University of Guelph (Canada)	Grand Valley State University (USA)	River Parishes Community College (Italy)
Developing a research strategy (Skill1)	587 ± 6	591± 14	593 ± 8	532 ± 17
Selecting and finding tools (Skill2)	566 ± 9	573 ± 20	569 ± 11	514 ± 24
Searching (Skill3)	568 ± 6	560 ± 15	566 ± 9	494 ± 16
Using finding tool features (Skill4)	645 ± 10	586 ± 25	641 ± 16	520 ± 27
Retrieving sources (Skill5)	580 ± 11	564 ± 23	596 ± 16	516 ± 26
Evaluating sources (Skill6)	595 ± 6	604 ± 18	610 ± 9	545 ± 16
Documenting sources (Skill7)	599 ± 8	616 ± 21	604 ± 15	499 ± 20
Understanding of economic, legal and social issues (Skill8)	565 ± 7	545 ± 17	564 ± 8	489 ± 17

Note: Scores are placed on a scale ranging from 0 to 1000 with standard error. Sources: University of Connecticut (2008), University of Guelph (2008), Grand Valley State University (2007), and River Parishes Community College (2008).

The information literacy skills of undergraduates from some foreign universities are presented in Table 7. However, making direct comparisons between Table 6 and Table 7 is not recommended since there are differences in research instruments used by each university, structure of the questions, and number of questions used in assessing each skill.

3.4. Overall score for information literacy skills

Table 8 and Figure 1 show the overall mean score for information literacy skills across Faculties.

Table 8 - Information literacy skills- overall score

	Faculty				
	Arch.	IT	Eng.		
	L 1	L 1	L1	L2	L4
Overall mean score for information literacy	0.42 (SD=0.12)	0.34, (SD=0.13)	0.36, (SD=0.13)	0.43 (SD=0.11)	0.43 (SD=0.14)

Note: Scores are placed on a scale ranging from 0 to 1.

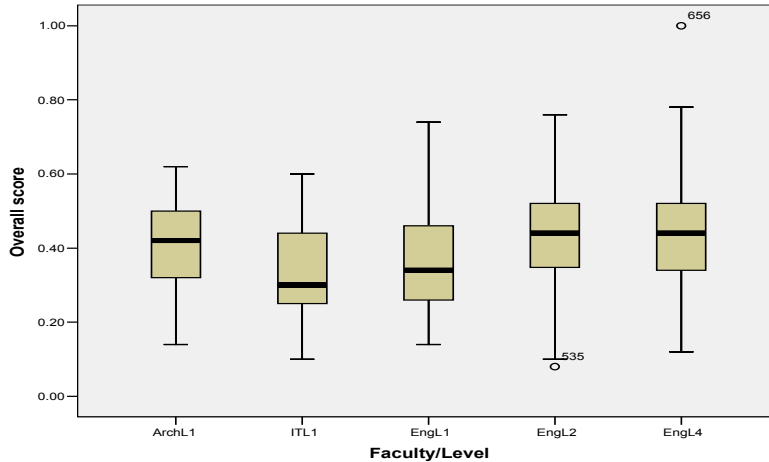


Figure 1- Information literacy - overall score

Figures 2 (a) to 2(e) show the distribution of overall scores across administrative districts from which undergraduates entered the university.

<u>District</u>	<u>Code</u>	<u>District</u>	<u>Code</u>	<u>District</u>	<u>Code</u>
Ampara	1	Jaffna	9	Matara	17
Anuradhapura	2	Kalutara	10	Moneragala	18
Badulla	3	Kandy	11	Mullativu	19
Batticaloa	4	Kegalle	12	Nuwara- Eliya	20
Colombo	5	Kilinochchi	13	Polonnaruwa	21
Galle	6	Kurunegala	14	Puttalam	22
Gampaha	7	Mannar	15	Ratnapura	23
Hambantota	8	Matale	16	Trincomalee	24
				Vavunia	25

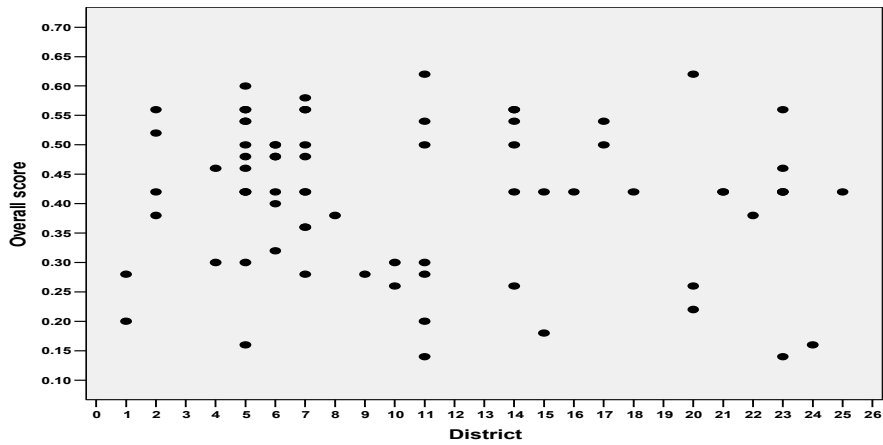


Figure - 2 (a): Arch. L 1

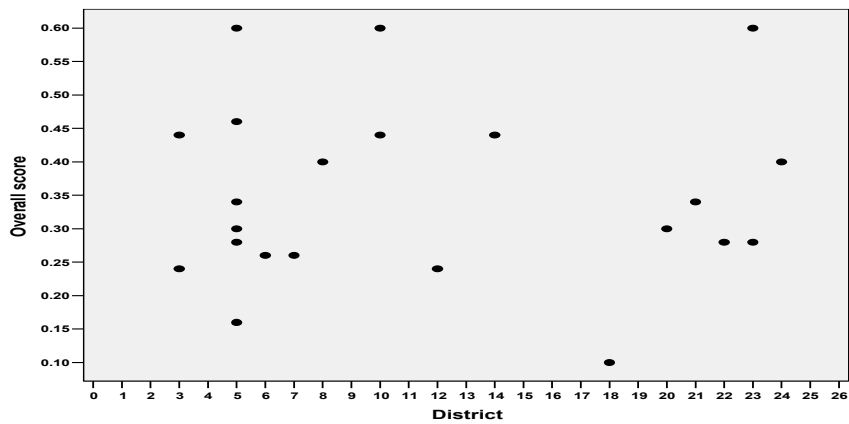


Figure - 2 (b): IT L 1

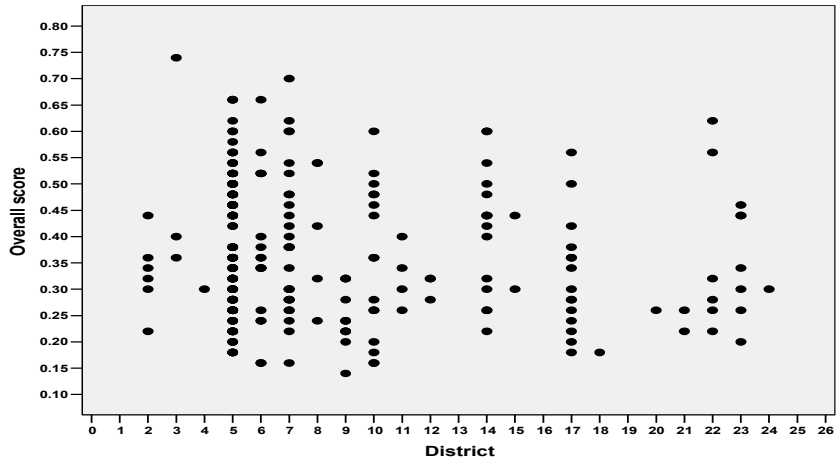


Figure - 2 (c): Eng. L 1

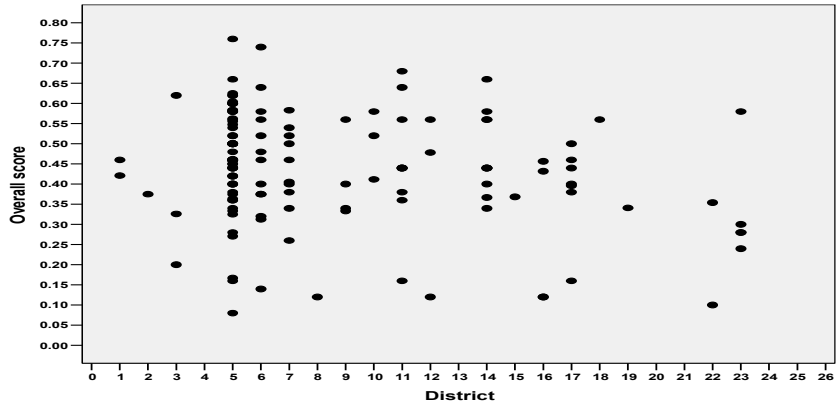


Figure - 2 (d): Eng. L 2

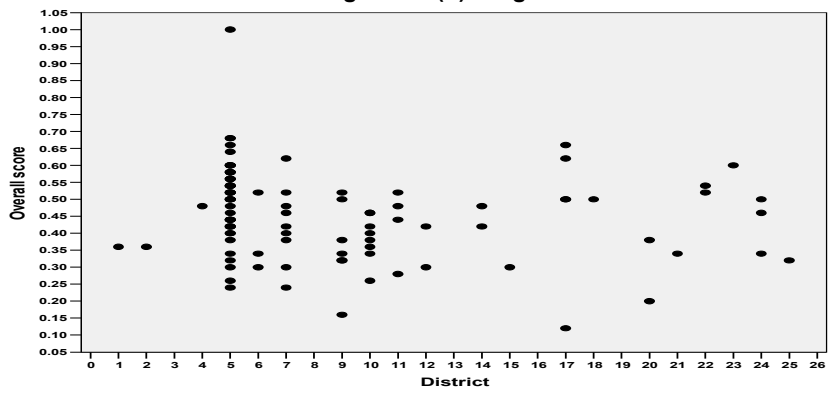


Figure - 2 (e): Eng. L 4

Note: Scores are placed on a scale ranging from 1 to 4.

3.5. Requirement of training to improve abilities in information literacy skills

The study also inquired whether undergraduates perceive any requirement of training to improve their abilities in information literacy skills. The results are shown in Table 9.

Table 9 - Requirement of training to improve abilities in information literacy skills

	Faculty				
	Arch. L 1	IT L 1	Eng.		
			L1	L2	L4
Training is not required (%)	42.0	23.0	40.0	40.0	24.0
Training is required (%)	58.0	77.0	60.0	60.0	76.0

3.6. Differences in information literacy skills by demographic characteristics of undergraduates

Data was analyzed to identify whether statistically significant differences exist in information literacy skills of undergraduates across demographic characteristics, namely, Z Score in the A/L examination, age, gender, ethnicity, religion, whether their mother is in a paid employment or housewife, and whether they had relatives living with them (such as grandparents) (Refer to Table 3). However, statistically significant differences have not been found either in information literacy test results, or perceived levels of information literacy skills. This confirms Thirion and Pochet’s (2009) observation, that individual characteristics and family background of undergraduates do not show statistically significant effects.

4. Concluding remarks

The study investigated information literacy skills of undergraduates and found the necessity of assessing information literacy skills of undergraduates across undergraduate degree programmes. To improve the level of information literacy skills of undergraduates, universities across the world, to date, use two main strategies.

First is to create a separate “information literacy skills course” (Fallows and Steven, 2000). For instance LOEX Clearinghouse (n.d) and Wang (2006)

provide evidence for broader use of courses on information literacy to enhance the skill levels of undergraduates. Further, Wang (2006) found statistically significant differences in “citation use” and “academic grades” between undergraduates who took “credit courses” on information literacy and those who did not take credit courses, in the USA. However, none of the universities in Sri Lanka has taken information literacy into the undergraduate curriculum to date (Ranaweera, 2009).

Second is to place “information literacy skills” on the same level as “subject skills”, thereby communicating the message that these are important to be learnt. In this regard, some scholars suggest (e.g. Marcum, 2002; Orr and Cribb, 2003) that information literacy skills should be included as part of course curricula within each discipline, rather than stand-alone sessions run by the library. The emphasis is on librarians to collaborate with academic colleagues and put more time into liaison, and course development and teaching (Marcum, 2002; Orr and Cribb, 2003). For instance, Emmett and Emde (2006) report a marked improvement in undergraduate information literacy skills when these are taught jointly by academic lecturers and librarians. In this regard, Thirion and Pochet (2009) state, “training should be planned as a partnership between the teacher and the librarian, so that both can bring in their specific knowledge. Generally the teacher alone does not have a complete mastery of the advanced specificities of information tools and techniques. And the librarian alone also cannot help the students with the core competences required for specific topics. However, the relevance of combining both has already been proved” (2009, p. 169). However, exactly where in the curriculum these skills should be included is largely a local decision (see Zinser, 2003).

It should be, however, noted that formulating strategies to improve information literacy skills at the University of Moratuwa is beyond the scope of this study.

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