



## Assessment of Pre and Final Year Undergraduate Veterinary Students Information Literacy Competencies and Attitude towards e-Learning

Omer Salih Elnoor<sup>1</sup>, Jaspal Singh Hundal<sup>2\*</sup>, Udeybir Singh Chahal<sup>2</sup> and Nirmal Singh<sup>3</sup>

<sup>1</sup>Department of Animal Health, Ministry of Animal Resources, South Kordofan State, SUDAN

<sup>2</sup>Department of Animal Nutrition, Guru Angad Dev Veterinary and Animal Sciences University, Ludhiana, Punjab, INDIA

<sup>3</sup>University Library, Guru Angad Dev Veterinary and Animal Sciences University, Ludhiana, Punjab, INDIA

\*Corresponding author: JS Hundal; E-mail: drjshundal@yahoo.com

Received: 21 July, 2016

Accepted: 30 September, 2016

### ABSTRACT

The study was conducted to assess the information literacy competencies of pre and final year undergraduate veterinary students and their attitude towards e-learning. The 120 pre-final and final year veterinary students studying at Guru Angad Dev Veterinary and Animal Sciences University, Ludhiana were selected randomly and data was collected with the help of a structural questionnaire consisting of 25 items with respect to concept identification, search strategy, document types, search tools, use of results and e-learning. The study revealed that only 12.5% of the veterinary students belonged to high knowledge level category whereas majority of them 68.3% ( $P < 0.01$ ) possessed low knowledge towards information literacy competencies. A high percentage of veterinary students lacked the necessary knowledge and skills to identify main concept and significance of words (52.5%), to opt appropriate search strategy (83.1%), to select required document types (42.1%), to utilize efficient search tools (73.8%) and to evaluate and use results (68.8%). Only 18.3% students had ability to use computer as experts. About 62.5% respondents used search engines as e-learning tool. About 87.9 and 89.7% male and female respondents possessed favourable attitude towards use of e-learning tools. Gender and OCPA had no significant association with knowledge level as well as e-learning attitude of veterinary students. The study revealed notable gaps among students towards information literacy competencies and e-learning, hence, teaching of credit bearing Information Literacy courses is imperative to enhance undergraduate veterinary students' knowledge and information seeking skills.

**Keywords:** Information literacy competencies, e-learning, veterinary students, Attitude

Information Literacy (IL) is the vital process in the modern changing world as it enables people to interpret and make informed judgments as users of information sources, as well as to become producers of information in their own right. Students with higher level of information literacy demonstrated strong potential for developing critical thinking skills (Allen, 2008) and achieving academic excellence. McNeill *et al.* (2003) stated that effective decision making in health care delivery relies on timely and accurate information. Veterinary students may need more sophisticated information literacy skills to locate, choose and execute the high quality evidence. Therefore, it is important for veterinary students now-a-days to be equipped with strong information literacy skills as well as positive e-learning attitude to succeed in their academic

and future professional endeavours. But teaching scientific information literacy skills to veterinary students is the missing link. It was noticed that veterinary students are not able to locate and identify relevant information or evaluate its quality. As no systematic study is available on the subject, therefore, the present study was planned to assess the information literacy competency level of veterinary students and their attitude towards e-learning.

### MATERIALS AND METHODS

The present study was conducted in College of Veterinary Sciences, Guru Angad Dev Veterinary and Animal Sciences University, Ludhiana. The data related to objectives of study was collected from 120 undergraduate

(pre-final and final year) veterinary students selected on the basis of random sampling technique through structural questionnaire. The questionnaire consisted of twenty five (25) questions, out of which 19 questions were related to five themes of information literacy competencies i.e. Concept Identification (Ability to distinguish between significant and non-significant terms, Identifying the main concepts in a topic by using key word), Search Strategy (Knowledge regarding the use of vocabulary tool such as thesaurus and appropriate Boolean operators), Document Types (Knowing when to refer to a book, journal, newspaper, Knowledge about peer review article), Search Tools (Knowing when to use a search engine, Meta search engine, Database, Library catalogue) and Use of Results (knowledge to read, evaluate and use of information legally and ethically), whereas, 6 questions were related to e-learning i.e. significance of Information Literacy in lifelong learning, skills in using computer, use of e-learning tools (Video Conferencing, E-mail, search engines, audio-video aids, online database, Consortium for e-Resources in Agriculture), importance of e-learning in learning experience as well as in studies and attitude towards e-learning.

Each question required information literacy competencies for relevant information access and utilization and these competencies became variables in the study. These variables were represented by multi choice questions to assess Information Literacy Competencies and by multiple option questions to study attitude towards e-learning. Each correct response was given a score of one. The information related to independent variables like Gender and Overall Credit Point Average (OCPA) was also collected. The collected data were carefully examined for completeness and correctness before tabulation. The data were analyzed for percentage, mean and standard deviation (Snedecor and Cochran, 1994). On the basis of mean and standard deviation, respondents were categorized into three groups (Chandrashekhar *et al.*, 1998) as a measure of check,

Total score on knowledge	Knowledge category
Less than (Mean – ½ S.D.)	Low
Between (Mean ± ½ S.D.)	Moderate
More than (Mean + ½ S.D.)	High

To find level of significance between different independent and dependent variables, Pearson Correlation Coefficient, Chi-square test and ANOVA were employed by using the

software package ‘Statistical Analysis Software (SAS, 14.1)’.

## RESULTS AND DISCUSSION

Concept identification is the ability to bring out all the key words that represent the topic. There were two questions on concept identification in this study, whose response distribution is given in Table 1. Data revealed that only 35.8% respondents were able to distinguish between significant and non-significant words. These findings have been supported by Dorvlo (2016), who reported that 60% respondents didn’t know how to identify a significant key word for an effective search. Boakye (1998) also found that most of the students lack the skill for formulating keywords for their search. However, a good number of respondents (59.2%) were able to identify the main concepts in a topic by using appropriate key word and they were seemed to be able to recognize words with similar meaning. These findings are similar to the results of Diane and Diane (2003) who reported that about 63% respondents were able to recognize words with same meaning. Ability of male respondents to differentiate between significant/non-significant terms (38.5% vs 27.6%) and female respondents to identify the main concepts in a topic (72.4% vs 54.9%) were higher as compared to others, however the differences were statistically non-significant ( $P < 0.01$ ). These findings were in conformity with findings of Mohammad (2014). Overall, 46.7 and 50.0% male and female respondents, respectively, were able to identify the main concepts in a topic as well as distinguish between significant and non-significant terms.

A search strategy is a comprehensive plan for finding information which includes defining the information needs and determining the form in which it is needed if it exists, where it is located, how it is organized and how to retrieve it (Glossary of Education, 2011). Results (Table 1) showed that most of the respondents were not familiar with controlled vocabulary tool such as a thesaurus (83.3%), function of Boolean operator ‘AND’ to restrict the number of search results (70.8%) and Boolean operator ‘OR’ to get more search results (95.0%). The thesaurus facilitates document retrieval by providing a list of preferred terms used to describe a subject in the database. These results were in accordance with those reported by earlier researchers (Diane and Diane, 2003; Rani, 2011; Ali *et al.*, 2010; Lamptey, 2008). No doubt a

**Table 1: Response distribution of undergraduate veterinary students' towards information literacy competencies**

Q. No.	Specific knowledge of the skills addressed in this area by the questionnaire	Correct responses		Chi-square	Overall response distribution N=120
		Males n=91	Females n=29		
<b>A Theme: Concept identification</b>					
1	Differentiating between significant and non-significant terms	35 (38.5)	8 (27.6)	1.131	43 (35.8)
2	Identifying the main concepts in a topic by using key word	50 (54.9)	21 (72.4)	2.778	71 (59.2)
	Overall correct responses for Concept Identification	85 (46.7)	29 (50.0)	1.656	114 (47.5)
<b>B Theme: Search Strategy</b>					
3	Using a thesaurus to get the preferred vocabulary for a particular database	14 (15.4)	6 (20.7)	0.446	20 (16.7)
4	Using Boolean operator 'AND' function	29 (31.9)	6 (20.7)	1.330	35 (29.2)
5	Using Boolean operator 'OR' function	1 (1.1)	5 (17.5)	12.064**	6 (5.0)
	Overall correct responses for Search Strategy	44 (16.1)	17 (19.5)	1.216	61 (16.9)
<b>C Theme: Document Types</b>					
6	Knowing when to refer to a book	57 (62.6)	23 (79.3)	2.751	80 (66.7)
7	Knowing when to refer to a journal	37 (40.7)	18 (62.1)	4.060	55 (45.8)
8	Knowing when to refer to a newspaper	75 (82.4)	26 (89.7)	0.864	101 (84.2)
9	Knowing which is a peer reviewed article	28 (30.8)	14 (48.3)	2.963	42 (35.0)
	Overall correct responses for Document Types	197 (54.1)	81 (69.8)	6.662	278 (57.9)
<b>D Theme: Search Tools</b>					
10	Knowing when to use a database	19 (20.9)	10 (34.5)	2.221	29 (24.2)
11	Knowing when to use a search engine such as Google	48 (52.7)	15 (51.7)	0.009	63 (52.5)

(Cont...)



12	Knowing when to use a meta search engine such as Copernic	2 (2.2)	0 (0)	0.648	2 (1.7)
13	Knowing how to launch a search in many search engines simultaneously	9 (9.9)	4 (13.8)	0.347	13 (10.8)
14	Knowing how to use a library catalogue	64 (70.3)	22 (75.9)	0.331	86 (71.7)
	Overall correct responses for Search Tools	142 (31.2)	51 (35.2)	4.190	193 (32.2)
<b>E Theme: Use of Results</b>					
15	Reading citation	4 (9.9)	4 (13.8)	0.347	8 (6.7)
16	Recognizing the type of document that corresponds to a bibliographic reference	16 (17.6)	6 (20.7)	0.142	22 (18.4)
17	Knowing the criteria used in evaluating the quality of a web site	28 (30.8)	13 (44.8)	1.932	41 (34.2)
18	Knowing why to include a reference	10 (11.0)	6 (20.7)	1.791	16 (13.4)
19	Ethical use of information	76 (83.5)	24 (82.8)	0.009	100 (83.4)
	Overall correct responses for Use of Results	134 (29.5)	53 (36.6)	4.680	187 (31.2)

Figures in parenthesis indicate percentage

\* \*Significant at 0.01 level

significant higher percentage (17.5%;  $P < 0.01$ ) of female respondents were more aware about function of Boolean operator 'OR' as compared to male respondents (1.1%), but overall the basic concept of Boolean operator 'AND' and 'OR' in searching information was poorly understood by the veterinary students. Most of male (83.9%) and female (80.5%) respondents lacked the strategy to perform searching efficiently by not being aware of the use of the vocabulary tool such as thesaurus and appropriate Boolean operators due to lack of specialized courses of information literacy in their curriculum and results are statistically similar. The results emphasized that gender didn't have any significant ( $P < 0.01$ ) effect on the knowledge level of respondents towards Search strategy.

Selection of document types is a key to get required information and results (Table 1) revealed that majority (66.7%) of the respondents recognized that books can be

used to familiarize oneself with a subject, 45.8% of them recognized journal as the best document type to obtain the latest information on a subject and 84.2% of the respondents knew that the latest information on an event publishes on newspapers. These findings were in accordance with those of Diane and Diane (2003) and Dorvlo (2016). Only 35.0% of the respondents knew that a peer reviewed article is an article which has been evaluated by other researchers in the same or related field for assessment of technical and scientific merit before being accepted for publication. The Information literacy competencies of male and female veterinary students were 62.6 and 79.3% about when to refer to a book, 40.7 and 62.1% about when to refer to a journal, 82.4 and 89.7% about when to refer to a newspaper and 30.8 and 48.3% about recognition of a peer review article. The values were little higher for female veterinary students but differences are statistically

non-significant. These findings were in accordance with findings of Mohammad (2014). Undergraduate students consult books more commonly for preparation of exams as compared to journals hence have more awareness about the type of information to be retrieved from the books. Obviously, they have less knowledge about peer review articles because of their low interest in reading of journals.

Search tools like library catalogues, databases, search engines and meta-search engines are the tools used in searching for information. The data (Table 1) revealed that only 24.2% respondents knew that the most efficient search tools to find journal articles is database and these findings were in accordance with those of Diane and Diane (2003) and Dorvlo (2016). About 52.5% of respondents recognized that when to use a search engine such as Google. They knew that it couldn't be used to locate books in library collections. Majority of respondents (98.3% and 89.2%) lacked knowledge regarding use of meta-search engines to find wider information with fewer efforts and to launch a search in many search engines simultaneously, respectively. This lack of knowledge about internet search engines can cause inefficiency in locating information. A major chunk of respondents (71.7%) were aware about the use of library catalogue but this finding was contrary to Diane and Diane (2003), Ali *et al.* (2010), Rani (2011) and Dorvlo (2016) which may be due to the reason that veterinary students visited the university library regularly for reading or preparation of class assignments, hence knew more about library catalogue. Overall, 31.2 and 35.2% male and female respondents, respectively, had ability to utilize search tools efficiently in order to locate required information. However, the effect of gender on number of correct responses with respect to search strategy has not been observed.

Use of results is another important criterion that can be used to evaluate the legal and ethically use of information. It was found (Table 1) that only 6.7% respondents were able to interpret/ recognize a citation of scholarly journal article, which indicated that there was lack of knowledge among respondents related to use of results which hinders efficient searching because the respondents will not be able to gauge the relevance and accuracy of a reference and subsequently unable to select the best way to search for information. These findings were in conformity with findings of Patti *et al.* (2001), Ali *et al.* (2010) and Rani (2011). A major chunk of respondents (81.6%) were unable

to distinguish between citation of book's chapter and other document types, and results are in accordance with Patti *et al.* (2001) and Siu *et al.* (2014). About 34.8% respondents were acclimatized with the criteria to evaluate an internet site despite it became the most popular search medium today. Similar findings were also reported by many other researchers (Somi and Jager, 2005; Anafo, 2009; Lwoga, 2013; Siu *et al.*, 2014). Most of the respondents (86.6%) were unaware about when to include a reference to an article they cite, thus may commit plagiarism without realizing it. These findings were in accordance with findings of Tarrant *et al.* (2007). As far as ethical use of information is concerned, 83.4% respondents had knowledge regarding meaning of the copyright. These findings have been supported by Lamptey (2008). It was reported that percentage of correct responses towards reading citation, ability to distinguish between two types of citations, knowledge about criteria to evaluate website, use of reference of cited article to avoid plagiarism and ethical use of information were 9.9 and 13.8 per cent, 17.6 and 20.7 per cent, 30.8 and 44.8 per cent, 11.0 and 20.7 per cent, 83.5 and 82.8 per cent, respectively, among male and female respondents, however differences are statistically non-significant, which clearly indicate that gender has no significant effect on Information literacy competencies of veterinary students towards Use of Results. These findings are in similarity with the findings of Mohammad (2014).

#### **Relationship between Overall Credit Point Average (OCPA) of undergraduate veterinary students and Information literacy competencies**

It was assumed that high scoring students assess more information sources for better understanding of the subject, to clear their doubts and to get more marks (OCPA), hence should have better Information literacy competencies as compared to others. So Pearson correlation coefficient was administered to test this assumption. The results are presented in Table 2. It was observed that there was positive relationship between OCPA and correct responses for Concept identification, Search strategy, Document types, Search tools and Use of results, however this association is non-significant. Similarly, OCPA was also positively related with overall correct responses which indicated that intelligent student learned the things better as compared to the others.



**Table 2: Relationship between Overall Credit Point Average (OCPA) of undergraduate veterinary students and Information literacy competencies**

Sl. No.	Correct responses for Information literacy competencies	'r' value
1	Concept Identification	0.066
2	Search Strategy	0.036
3	Document Types	0.095
4	Search Tools	0.151
5	Use of Results	0.116
6	Overall correct responses	0.057

**Knowledge levels of undergraduate veterinary students towards Information literacy competencies**

The extent of awareness of veterinary students towards information literacy competencies is given in Table 3. The data revealed that most of the respondents either belonged to low (68.3%;  $P < 0.01$ ) or moderate (19.2%) knowledge level category whereas only 12.5 per cent of the veterinary students possessed high knowledge, which indicated that knowledge level of students towards Information literacy competencies was quite low and there is need to introduce credit bearing course, training and orientation programme to enhance their skills.

**Table 3: Knowledge level of undergraduate veterinary students towards Information literacy competencies**

Sl. No.	Knowledge level category	Extent of knowledge	
		Frequency (N=120)	Per cent
1	Low (upto 7.393 score)	82 <sup>b</sup>	68.3
2	Moderate (7.394 to 9.946 score)	23 <sup>a</sup>	19.2
3	High ( 9.946 score)	15 <sup>a</sup>	12.5

Figures with different superscript in a row differ significantly,  $P < 0.01$

**Attitude of undergraduate veterinary students towards information literacy and e learning**

The response distribution regarding attitude of veterinary students towards information literacy and e-learning is given in Table 4. The data revealed that most of the respondents (82.5%) considered information literacy as very significant or significant tool for lifelong learning.

About 65% of the respondents had intermediate ability to use computer, however, only 23.3% respondents possessed higher (expert/advanced) skills to use computer effectively. The percentage of veterinary students using Video conferencing, Electronic mail, Search engines, Audio/Video aids, CD-ROM/ Online databases and CeRA as e-learning tool were 5.8, 23.3, 62.5, 35.0, 8.34 and 1.67%, respectively. The higher use of search engines as e-learning tool by the veterinary students indicated the popularity of internet among them, as they were addicted to it to retrieve required information on the subjects of their interest. About 29.2% respondents believed that e-learning gives opportunities to acquire new knowledge, 30.0% respondents believed that e-learning enhances their learning experience and 15.8% respondent felt that convenience is an important feature of e-learning whereas 25.8% respondents enjoyed use of Information Communication Technologies for their studies. About half (50.8%) of veterinary students replied that it would be useful to download and access online audio/visual recordings of lectures for their study, 34.2% considered that use of mobile phones was beneficial to access web-based information and only 10.0% respondents opined to receive pre-class discussion questions from their teachers via text-message for effective teaching. Now-a-days the social networking sites are gaining popularity day by day but only 18.3% respondents wanted to communicate with other students through these sites for academic purpose. When students were asked to clarify their attitude towards e-learning, a major chunk of respondents (88.3%) had shown favourable attitude towards use of e-learning tools whereas only 1.7% were disagreed with the idea.

The effect of gender on response distribution of veterinary students towards information literacy and e-learning is given in Table 4. The results showed there was no significant ( $P < 0.01$ ) association between gender and correct responses as far as e-learning is concerned. But there was positive correlation ( $r = 0.091$ ) between OCPA and e-learning attitude of veterinary students, however, difference is statistically non-significant.

**CONCLUSION**

A high percentage of the pre and final year undergraduate veterinary students lacked the necessary knowledge and skills to identify the concept, strategy to perform search,

**Table 4: Response distribution regarding attitude of undergraduate veterinary students towards information literacy and e-learning**

Q. No.	Question	Response distribution		Chi square	Overall response distribution N=120
		Male n=91	Female n=29		
<b>20</b>	<b>Do you think that Information Literacy is significant for lifelong learning?</b>				
	a. Very significant	41 (45.1)	9 (31.0)	1.779	50 (41.67)
	b. Significant	34 (37.4)	15 (51.7)	1.877	49 (40.84)
	c. Somewhat significant	10 (11.00)	2 (6.9)	0.409	12 (10.0)
	d. Not significant	2 (2.2)	1 (3.4)	0.141	3 (2.5)
	e. I do not know	4 (4.4)	2 (6.9)	0.290	6 (5.0)
<b>21</b>	<b>Indicate your ability to use computer</b>				
	a. Unskilled	1 (1.1)	1 (3.4)	0.741	2 (1.67)
	b. Beginner	9 (9.9)	3 (10.3)	0.005	12 (10.0)
	c. Intermediate	56 (61.5)	22 (75.9)	1.983	78 (65.0)
	d. Expert	19 (20.9)	3 (10.3)	1.630	22 (18.34)
	e. Advanced	6 (6.6)	0 (0)	2.013	6 (5.0)
<b>22</b>	<b>Which of the following e-learning tools do you use?</b>				
	a. Video Conferencing	5 (5.5)	2 (6.9)	0.079	7 (5.84)
	b. Electronic Mail ( E-mail)	22 (24.9)	6 (20.7)	0.149	28 (23.34)
	c. Search Engines	58 (63.7)	17 (58.6)	0.246	75 (62.5)
	d. Audio/Video aids	32 (35.6)	10 (34.5)	0.004	42 (35.0)
	e. CD-ROM/ Online databases	7 (7.7)	3 (10.3)	0.203	10 (8.34)
	f. CeRA	2 (2.2)	0 (0)	0.648	2 (1.67)
<b>23</b>	<b>Please indicate your agreement with the following statements</b>				
	a. I enjoy using Information Communication Technologies for my studies	22 (24.2)	9 (31)	0.540	31 (25.84)
	b. I believe e-learning gives opportunities to acquire new knowledge	26 (28.6)	9 (31)	0.065	35 (29.17)
	c. I believe e-learning enhances my learning experience	28 (30.8)	8 (27.6)	0.106	36 (30.0)
	d. I feel that convenience is an important feature of e-learning	13 (14.3)	6 (20.7)	0.677	19 (15.84)
<b>24</b>	<b>In your studies, do you think that it would be useful to</b>				
	a. Download and access online audio/visual recordings of lectures	44 (48.4)	17 (58.6)	0.928	61 (50.84)
	b. Use mobile phones to access web-based information services of university	33 (36.3)	8 (27.6)	0.736	41 (34.17)
	c. To contribute with other students to develop wiki related to your course	7 (7.7)	2 (6.9)	0.020	9 (7.5)
	d. To receive pre-class discussion questions from teachers via text-message	10 (11)	2 (6.9)	0.409	12 (10.0)
	e. Use social networking sites to communicate with other students for academic purposes	17 (18.7)	5 (17.2)	0.030	22 (18.34)

(Cont...)



**25 Please indicate your attitude towards e-learning**

a. I dislike the idea of using e-learning tools	0 (0)	2 (6.9)	6.382*	2 (1.67)
b. I have a favourable attitude towards using e-learning tools	80 (87.9)	26 (89.7)	0.065	106 (88.34)
c. Can't say	11 (12.1)	1 (3.4)	1.824	12 (10.0)

Figures in parenthesis indicate percentage

\* Significant at 0.05 level

selection of document types, efficient utilization of search tools, to evaluate and use of information legally and ethically. Gender and OCPA have no significant association with knowledge level of veterinary students. So skills on identifying, interpreting, evaluating and accessing information needs to be developed and enhanced among graduate veterinary students. Most of the respondents admitted importance of information literacy in lifelong learning as well as in studies and indicated favourable attitude towards e learning, hence teaching of credit bearing Information Literacy course is imperative to enhance undergraduate veterinary student’s knowledge and information seeking skills.

**REFERENCES**

Ali, R., Abu-Hassan, N., Daud, M. and Jusoff, K. 2010. Information literacy skills of engineering students. *Int. J. Res. Rev. App. Sci.*, **5**(3): 264-270.

Allen, M. 2008. Promoting critical thinking skills in online information literacy instruction using a constructive approach. *College Undergraduate Library*, **15**: 21-38.

Anafo, P. 2009. Promoting information literacy among undergraduate students of Ashesi University College. MA dissertation of the department of information studies. Legon: University of Ghana, pp. 60-68.

Boakye, J. 1998. Awareness and use of library collections in Ghana: A case study of science and technology collection in the Kwame Nkrumah University of Science and Technology, pp. 22-29.

Chandrashekar, B.R., Lakshminarayan, M.T., Krishnamurthy, B. and Shivaramu, K. 1998. Rabies: factors influencing the knowledge of veterinarians. *Mysore J. Agri. Sci.*, **32**: 225-228.

Diane, M. and Diane, Q. 2003. Information literacy: Study of incoming first-year undergraduates in Quebec. Conference of Rectors and Principals of Quebec Universities.

Dorvlo, S.S. 2016. Information literacy among postgraduate students of the University of Ghana. *Library Philosophy*

and Practice (e-journal). Paper 1392. Available at <http://digitalcommons.unl.edu/libphilprac/1392>

Glossary of Education. 2011. Available at://www.education.com.retrieved on 5<sup>th</sup> June 2016.

Lampitey, F.A. 2008. Information literacy among graduate students of university of Cape Coast. A Dissertation of the Department of Information Studies. Legon: University of Ghana, pp. 88-93.

Lwoga, E. T. 2013. Faculty perceptions and practices in health sciences information literacy instruction in Tanzania. *Lib. Phil. Pract., (e-journal)*: 1017.

McNeil, B., Elfrink, V., Bickford, C., Pierce, S., Beyea, S., Averill, C. and Klappen, C. 2003. Nursing information technology knowledge, skills and preparation of student nurses, nursing faculty and clinicians: a US survey. *J. Nurs. Edu.*, **42** (8): 341-349.

Mohammad, R.S. 2014. Investigation the relationship between information literacy and academic performance among students. Health information Technology Research Centre, Isfahan University of Medical Sciences, Isfahan, Iran.

Patti, S.C., Judith, H. and Eleanor, M. 2001. Assessment the information literacy of undergraduates: Reports from the UCLA library’s information competencies survey project.

Rani, S. 2011. Information literacy programmes for undergraduate students. *Int. J. Digi. Lib. Serv.*, **1**(1): 49-61.

Siu, F.L.C., Chan, R.C.H. and Chu, S.K.W. 2014. Developing information literacy among liberal studies students in Hong Kong. Paper presented at the 12<sup>th</sup> Annual Hawaii International Conference on Education. Honolulu, Hawaii.

Snedecor, G.W. and Cochran, W.G. 1994. Statistical methods. Oxford and IBH publications, New Delhi.

Somi, N.G. and de Jager, N. 2005. The role of academic libraries in the enhancement of information literacy: A survey of Fort Hare Library. *South Afr. J. Lib. Inform. Sci.*, **71**(3): 259-267.

Tarrant, M., Dodgson, J.E. and Law, B.V.K. 2007. A curricular approach to improve the information literacy and academic writing skills of part-time post-registration nursing students in Hong Kong. *Nur. Edu. Tod.*, **23**: 458-468.