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USE OF LIBRARIES AND INFORMATION CENTRES BY SCIENTISTS AND TECHNOLOGISTS IN BANGLADESH

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ABSTRACT :

Scientists and technologists are major users of libraries and information centres. This paper studies their usage pattern by considering the influence of their background variables, namely, age, gender, qualifications and status. The study sample population consists of 246 scientists and technologists from two major scientific and technical research institutes in Bangladesh. One-way analysis of variance (ANOVA) statistical test was used to test the hypotheses and the results of the analysis show that the socio-economic background variables influence the use of libraries and information centres.

Keywords: Libraries; Information centres; Scientists; Technologists; Bangladesh; Library users.

INTRODUCTION

Libraries and information centres are essential institutions for the communication of scientific and technological ideas. They identify, collect, organise, store, retrieve, and disseminate specialised information, and make it available to the right person at the right time and in the right form. They act as an intermediary and a communication institution concerned with the communication of information amongst scientists and technologists. Scientists and technologists differ in their socio-economic background and this may have an impact on their use pattern. In order to test this supposition, a study was conducted by taking into consideration five variables, namely, age, gender, qualifications, status and pay scale. These are measured on different scale points depending on the type of variable. One variable, pay scale, was dropped from the final analysis as it was found that different institutions followed different pay scales for the same status (rank).

METHODOLOGY

The study adopted the survey method, using questionnaires, in order to study the usage pattern of libraries and information centres by scientists and technologists. The sample population consisted of 246 scientists and technologists from two research institutes, namely, the International Centre for Diarrhoeal Diseases Research of Bangladesh (ICDDRB) in Dhaka, and the Fisheries Research Institute (FRI) in Mymenshingh. Both these institutes have their own library and information centre. The library and information centre of ICDDRB is known as the Dissemination and Information Service Centre (DISC), whilst the library and information centre of FIR is known as the Fisheries Research Institute Library and Documentation Centre (FRILDOC). Questionnaires were administered to 220 scientists and technologists, and excluded those who were either abroad or on long leave. Out of 220, only 121 returns were obtained from both groups. This represented a response rate of 55%.

This study aims to find out the factors that may be related to the usage pattern of libraries and information centres among scientists and technologists in Bangladesh. The null hypothesis adopted for this study is as follows.
There is no significant difference in the use of libraries and information centres:

(a) by age of the scientists and technologists;
(b) by gender of the scientists and technologists;
(c) by qualifications of the scientists and technologists;
(d) by inland qualifications of the scientists and technologists;
(e) by foreign qualifications of the scientists and technologists;
(f) by status of the scientists and technologists; and
(g) by age, gender, qualifications and status of the scientists and technologists.

To test the hypotheses, the statistical analysis technique known as the Analysis of Variance (ANOVA) was used. It tests whether or not the means of the groups (μ_n) being studied are equal. The equality of means of age, gender, qualifications as well as the status of scientists and technologists, and their use of libraries and information centres were tested separately. For each test, the null hypothesis of equality (H_o) of means takes the form of:

H_o : all μ's are equal
i.e. $H_o : \mu_1=\mu_2=\mu_3= ... ... =\mu_n$

The alternative hypothesis (H_a) takes the form of :

H_a : not all μ's are equal (Moline, 1989).

For each test for significance, the null hypothesis (H_o) takes the form of :

$H_o : F_o < F_c$

The alternative hypothesis (H_a) takes the form:

$H_a : F_o > F_c$

where, F_o = Observed value of F-ratio

F_c = Critical value of F-ratio, and

$$F\text{-}ratio = \frac{MeanSquare(MS)betweenthesample}{MeanSquare(MS)withinthesample}$$

ANALYSIS AND RESULTS

Background Variables

Table 1 shows that the highest number of scientists and technologists falls within the age group of 41-50 years, followed by 31-40 years, <31 years and 50> years. In the case of gender, 95 (78.5%) scientists and technologists are males and only 26 (21.5%) are females.

Table 1: Background of Scientists and Technologists (N=21)

Sl. No.	Background variables	Number of respondents	Percentage of respondents	Cumulative percentage
1.	AGE			
	<31 Years	19	15.7	15.7
	31-40 Years	40	33.1	48.8
	41-50 Years	48	39.7	88.4
	50> Years	14	11.6	100.0
2.	GENDER			
	Male	95	78.5	78.5
	Female	26	21.5	100
3.	QUALIFICATION			
	Ph.D. or M.Phil.	40	33.1	33.1
	M.Sc. or equivalent	65	53.7	86.8
	MBBS or other degrees	16	13.2	100
4.	STATUS			
	Director or equivalent level	17	14.0	14.0
	Associate scientist or equivalent level	35	28.9	42.9
	Assistant scientist or equivalent level	18	14.9	57.8
	Scientific officer or equivalent level	51	42.1	99.9

The table also shows that the highest number of scientists and technologists falls within the Scientific Officer or equivalent level group; followed by the Associate Scientist or equivalent level group, Assistant Scientist or equivalent level group and Director or equivalent level group.

Three major qualification groups are identified and used for this study. Table 1 shows that 65 scientists and technologists possess M.Sc. or equivalent degrees; followed by 40 with Ph.D. or M. Phil degree, and 16 with MBBS or other degrees. Qualifications have been further classified into two groups, namely, local qualifications (those who obtained degrees from universities in Bangladesh) and foreign qualifications (those who obtained their degrees from abroad). This variable was considered in order to determine whether local or foreign qualifications have any impact on the usage of libraries and information centres.

Table 2: Qualifications of Scientists and Technologists

Qualifications	**Frequency**		**%**		**Cumulative %**	
	Local	Foreign	Local	Foreign	Local	Foreign
Ph.D. or M.Phil.	8	32	11.6	61.5	11.6	61.5
M.Sc. or equivalent	51	14	73.9	26.9	86.5	88.5
MBBS or other degrees	10	6	14.5	11.5	100.0	100.0
Total	69	52	100.0	100.0	100.0	100.0

Table 2 shows that out of 121 scientists and technologists, 69 possess local and 52 have foreign qualifications. Out of the 69 scientists and technologists with local qualifications, 51 have M.Sc. or equivalent degrees; followed by 10 who have MBBS or other degrees, and 8 scientists and technologists have Ph.D. or M.Phil. degrees. Out of the 52 scientists and technologists with foreign qualifications, 32 have a Ph.D. or M.Phil. degree, followed by 14 who have M.Sc. or equivalent degrees, and 6 have MBBS or other degrees.

USE OF LIBRARIES AND INFORMATION CENTRES

Test of the hypotheses was conducted via a one-way or single factor Analysis of Variance (ANOVA) statistical test that computed variables such as age, gender, qualifications and status of scientists and technologists against use of libraries and information centres. Lawal (1983), Moline (1989), and Saraf (1995) also used this statistical technique for their data analysis. The results of the analysis are presented below.

Age and Use of Libraries and Information Centres

Four different age groups of scientists and technologists are used to compare with usage of libraries and information centres (Table 3). The ANOVA results show that scientists and technologists who are <31 years old use "parent institutional libraries and information centres" (mean score=4.736) more. This is followed by those who are between the ages of 31-40 years (mean score=4.525), those within the age range of 41-50 years (mean score=4.395) and those >50 years old (mean score=4.357). The results indicate that the young scientists and technologists use "parent institutional libraries and information centres" more than their older colleagues.

Table 3: Use of Libraries and Information Centres by Age

Types of the Centres	**Mean Scores of Use**				**F Ratio df=3,117**
	<31 Years	**31-40 Years**	**41-50 Years**	**>50 Years**	
Parent Institutional Libraries and Information Centres	4.736 1	4.525 2	4.395 3	4.357 4	1.012 p=0.389
Other Libraries and Information Centres	3.368 2	3.475 1	3.250 3	2.214 4	7.483* p=0.000

N=121; *Significant at p<0.05; Critical F=2.68

The calculated F value of 1.012 indicates that the age of scientists and technologists has no significant influence on the use of "parent institutional libraries and information centres" (p<0.05; df=3,117; F=1.012). However, the use of "other libraries and information centres", shows that scientists and technologists who are between the ages of 31-40 year, use "other libraries and information centres" (Mean score=3.475) more than those in the other age groups. This results show that mid-age as well as young scientists and technologists use "other libraries and information centres" more when compared to older ones. The calculated F value of 7.483 indicates that the age of scientists and technologists significantly influenced their use of "other libraries and information centres" (p<0.05; df=3,117; F=7.483). Therefore, the null hypothesis (a), which states that there is no significant difference in the use of libraries and information centres by age of the scientists and technologists, is rejected.

Use of Libraries and Information Centres by Gender of Respondents

The ANOVA results show that female scientists and technologists use "parent institutional libraries and information centres" more (mean score=4.653) when compared to their male counterparts (mean score=4.442) (Table 4). The calculated F value of 1.485 indicates that the gender of scientists and technologists does not influence the use of "parent institutional libraries and information centres" ($p<0.05$; df=1,119; F=1.485). Regarding the use of "other libraries and information centres", the ANOVA results show that male scientists and technologists use "other libraries and information centres" more (mean score=3.305) when compared to female scientists and technologists (mean score=2.923).

Table 4: Use of Libraries and Information Centres by Gender

Types of the Centres	Mean Scores of Use		F Ratio df=1,119
	Male	Female	
Parent Institutional Libraries and Information Centres	4.442 2	4.653 1	1.485 p=0.225
Other Libraries and Information Centres	3.305 1	2.923 2	3.441 p=0.067

N=121; *Significant at $p<0.05$; Critical F=3.92

The calculated F value of 3.441 indicates that the gender of scientists and technologists shows no significant influence in the use of libraries and information centres ($p<0.05$; df=1,119; F=3.441). Therefore, the null hypothesis (b), which states that there is no significant difference in the use of libraries and information centres by gender of the scientists and technologists, is accepted.

Qualifications and the Use of Libraries and Information Centres

The usage of libraries and information centres by three different qualification groups of scientists and technologists were compared (Table 5). The ANOVA shows that scientists and technologists who have higher degrees, i.e. "Ph.D. or M.Phil." use "parent institutional libraries and information centres more (mean score=4.634), followed by those who have M.Sc. or equivalent degrees (mean score=4.421), and those who have "MBBS or other degrees" (mean score=4.375). The scientists and technologists who have higher degrees use "parent institutional libraries and information centres" more when compared to those with lower degrees.

Table 5: Use of Libraries and Information Centres by Qualifications

Types of the Centres	**Mean Scores of Use**			**F Ratio df=2,118**
	Ph.D. or M.Phil.	M.Sc.or equivalent	MBBS or other degrees	
Parent Institutional Libraries and Information Centres	4.634 1	4.421 2	4.375 3	1.101 p=0.335
Other Libraries and Information Centres	3.048 3	3.359 2	3.500 1	1.971 p=0.143

N=121; *Significant at p<0.05; Critical F=3.07

The calculated F value indicates that the qualifications of scientists and technologists do not significantly influence the use of "parent institutional libraries and information centres" ($p<0.05$; df=2,118; F=1.101).

However, for the use of "other libraries and information centres", the ANOVA results show that scientists and technologists who have "MBBS or other degrees" use these institutions more (mean score=3.500); followed by those who have "M.Sc. or equivalent degrees" (mean score=3.359), and those with "Ph.D. or M.Phil. degree" (mean score=3.048). In this case also, scientists and technologists who hold lower degrees tend to use "other libraries and information centres" more than those with higher degrees. The calculated F value of 1.971 indicates that the use of libraries and information centres is not influenced by the qualifications of scientists and technologists ($p<0.05$; df=2,118; F=1.971). Therefore, the third null hypothesis (c), which states that there is no significant difference in the use of libraries and information centres by the qualifications of the scientists and technologists, is accepted.

Local Academic Qualifications and Use of Libraries and Information Centres

Scientists and technologists from three different local academic qualification groups were compared on the use of libraries and information centres (Table 6). The ANOVA shows that those with the highest degree use "parent institutional libraries and information centres" more (mean score=4.500), followed by those who have "M.Sc. or equivalent degrees" (mean score=4.411) and those having "MBBS or other degrees" (mean score=4.300) come in the last position. Thus, scientists and technologists with higher degrees tend to use the "parent

institutional libraries and information centres" more when compared to those with lower degrees.

Table 6 :Use of Libraries and Information Centres by Local Academic Qualifications

Types of the Centres	Mean Scores of Use			F Ratio df=2,66
	Ph.D. or M.Phil.	M.Sc.or equivalent	MBBS or other degrees	
Parent Institutional Libraries and Information Centres	4.500 1	4.411 2	4.300 3	0.120 p=0.886
Other Libraries and Information Centres	3.00 3	3.451 2	3.900 1	2.083 p=0.132

N=69; *Significant at p<0.05; Critical F=3.14

The calculated F value of 0.120 indicates that the "Local qualifications" of scientists and technologists do not significantly influence the use of "parent institutional libraries and information centres" ($p<0.05$; df=2,66; F=0.120).

However, in the use of "other libraries and information centres", the ANOVA shows that scientists and technologists who have "MBBS or other degrees" (mean score=3.900) use these places more, followed by those who have "M.Sc. or equivalent degrees" (mean score=3.451), and "Ph.D. or M.Phil." degree holders (mean score=3.000) are placed third. In this case, scientists and technologists with lower degrees tend to use "other libraries and information centres" more when compared to those with higher degrees. The calculated F value of 2.083 indicates that the local academic qualifications of scientists and technologists do not significantly influenced their use of "other libraries and information centres" ($p<0.05$; df=2,66; F=2.083). Therefore, the null hypothesis (d), which states that there is no significant difference in the use of libraries and information centres by "local qualifications" of the scientists and technologists, is accepted.

Foreign Academic Qualifications and Use of Libraries and Information Centres

Similarly, three different groups of scientists and technologists with foreign qualification were compared on their usage of libraries and information centres (Table 7). The ANOVA results show that those who have the higher degree (Ph.D. or M.Phil.) use "parent institutional libraries and information centres" more (mean score=4.687), followed by those who have "MBBS or other

degrees" (mean score=4.500), and those who have "M.Sc. or equivalent degrees" (Mean score=4.428. In this case, scientists and technologists with higher degrees use "parent institutional libraries and information centres" more as compared to the others. The calculated F value of 0.804 indicates that "foreign qualifications" of scientists and technologists do not significantly influence the use of "parent institutional libraries and information centres" ($p<0.05$; df=2,49; F=0.804).

Table 7: Use of Libraries and Information Centres by Foreign Academic Qualifications

Types of the Centres	Mean Scores of Use			F Ratio df=2,49
	Ph.D. or M.Phil.	M.Sc. or equivalent	MBBS or other degrees	
Parent Institutional Libraries and Information Centres	4.687 1	4.428 3	4.500 2	0.804 p=0.453
Other Libraries and Information Centres	3.000 1	2.857 2	2.500 3	0.981 p=0.906

N=52; *Significant at $p<0.05$; Critical F=3.18

Regarding the use of "other libraries and information centres", the ANOVA results show that scientists and technologists who have "Ph.D. or M.Phil. degree" use "other libraries and information centres" more (mean score=3.000), followed by those who have "M.Sc. or equivalent degrees" (mean score=2.857) and those who have "MBBS or other degrees" (mean score=2.500). Scientists and technologists with higher degrees, use "other libraries and information centres" more as compared to those with lower degrees. The calculated F value of 0.981 indicates that "foreign qualifications" of scientists and technologists have no significant influence on their use of "other libraries and information centres" ($p<0.05$; df=2,49; F=0.981). Therefore, the null hypothesis (e), which states that there is no significant difference in the use of libraries and information centres by scientists and technologists with foreign qualifications, is accepted.

Status and Use of Libraries and Information Centres

Scientists and technologists from four different status groups were compared pertaining to their use of libraries and information centres (Table 8). The ANOVA results show that scientists and technologists who hold the position of "Director or equivalent status holder" use "parent institutional libraries and information centres" more (mean score=4.823), followed by those who are "Associate Scientists or equivalent status holder" (mean score=4.628), and

those who are "Assistant Scientists or equivalent status holder" (mean score=4.500). The lowest use comes from those who are "Scientific Officer or equivalent level" (mean score=4.274). Hence, those higher in rank tend to use "parent institutional libraries and information centres" more than those lower in rank.

Table 8 : Use of Libraries and Information Centres by Status (Rank)

Types of the Centres	**Mean Scores of Use**				**F Ratio df=3,117**
	Director	**Associate Scientists**	**Assistant Scientists**	**Scientific Officer**	
Parent Institutional Libraries and Information Centres	4.823 1	4.628 2	4.500 3	4.274 4	2.775* p=0.044
Other Libraries and Information Centres	3.285 4	3.285 3	3.555 1	3.352 2	6.787* p=0.000

N=121; 1: or equivalent; *Significant at $p<0.05$; Critical F=2.68

The calculated F value of 2.775 indicates that the status of scientists and technologists significantly influence the use of "parent institutional libraries and information centres" ($p<0.05$; df=3,117; F=2.775).

Regarding the use of "other libraries and information centres", the ANOVA results show that scientists and technologists who are "Assistant Scientists or equivalent level" use "other libraries and information centres" more (mean score=3.555), followed by those who are "Scientific Officer or equivalent status holder" (mean score=3.352), the "Associate scientists or equivalent status holder" (mean score=3.285) and "Director or equivalent status holder" (mean score=2.352. Therefore, scientists and technologists who are lower in status use "other libraries and information centres" more as compared to those who are higher in status. The calculated F value of 6.787 indicates that the status (rank) of scientists and technologists significantly influence the use of "other libraries and information centres" ($p<0.05$; df=3,117; F=6.787). Therefore, the null hypothesis (f), which states that there is no significant difference in the use of libraries and information centres by status (rank) of the scientists and technologists, is rejected.

Use of Libraries and Information Centres by Age, Gender, Qualifications and Status

Table 9 summarises the overall findings in the study pertaining to the use of libraries and information centres by age, gender, qualifications and status. The Table shows that there is a significant difference between age and the use of "parent institutional libraries and information centres" (F_o=5.226, F_c=2.68, df=3,117, $p<0.05$) and "other libraries and information centres" (F_o=3.579, F_c=2.68, df=3,117, $p<0.05$). The same is true in the case of gender and the use of "other libraries and information centres" (F_o=7.854, F_c=3.92, df=1,119, $p<0.05$). A significant difference was also found in the case of status and the use of "parent institutional libraries and information centres" (F_o=5.607, F_c=2.68, df=3,117, $p<0.05$). No significant difference however was found between qualifications and the use of any library and information centre.

Therefore, the null hypothesis (g), which states that there is no significant difference in the use of libraries and information centres by age, gender, qualifications and status of the scientists and technologists, is rejected.

Table 9: Use of Libraries and Information Centres by Age, Gender, Qualifications, and Status (Value=F).

Name of the variable	Parent Institutional Libraries and Information Centres	Other Libraries and Information Centres
Age	5.226*	3.579*
Gender	0.371	7.854*
Qualifications	0.016	0.280
Status	5.607*	2.365

N=121; *Significant at $p<0.05$

IMPLICATIONS

This study highlights two major factors in the use of libraries and information centres. Firstly, socio-economic variables such as age, gender, qualifications and status of the scientists and technologists, are relevant variables to assess the extent of use of libraries and information centres. Secondly, scientists and technologists do not depend solely on the resources of their parent institutional libraries and information centres, but they use other libraries too. The first finding enables managers to know the extent of use by the different social groups. If a social group is found to be comparatively low in the usage of libraries, reasons can be identified and services redesigned accordingly. The second finding has much wider implications. It implies that in this age of knowledge and information explosion, no library can be self-sustaining. It

should resort to resource sharing and the solution lies in networking. A library or information centre should serve as an access point to resources that are available worldwide. In this connection, it will not be out of place to mention that Bangladesh is quite conscious of this factor. Initiatives taken by the Bangladesh National Scientific and Technical Documentation Centre (BANSDOC) in 1995 to automate and network all scientific and technological libraries, bear a clear testimony to this fact. The Bangladesh National Scientific and Library Information Network (BANSLINK) which is functioning in this country today, is an outcome of this initiative.

REFERENCES

Lawal, O.P. 1983. *Professionalism in Nigerian librarianship*. Ph.D. thesis, Loughborough University Technology: 87-90.

Moline, Sandra R. 1989. The influence of subject publisher type and quality published on journal process. *Journal of Academic Librarianship*, Vol. 15, no.1: 12-18.

Saraf, Veena. 1995. *Leadership style and effectiveness in management of university libraries in India*. Ph. D. thesis, Department of Library and Information Science, North-Eastern Hill University: 58-117.