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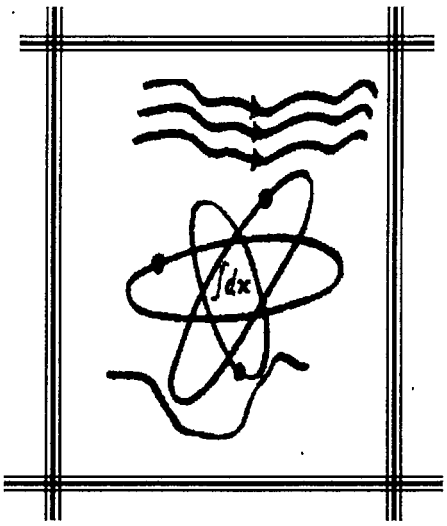

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Assessing the Impact of University Library Services on Academic Performance of Students: Exploratory Factor Analysis of a Survey Instrument

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Abstract

University library provides the needed required materials, data, information, and literature for research, which is crucial to human knowledge and scientific advancement.These libraries are set up to enhance academic output of students. Several factors contribute to determine Students Academic Achievement in the university, however, the extent to which students use library facilities has not been fully considered to be one of such factors. Thus, this study performed an exploratory factor analysis of a survey instrument assessing the impact of library services on academic performance of students in Federal University of Technology, Minna, Nigeria, as part of a project to address this concern.The survey instrument was developed on the basis of a qualitative studyand distributed to 450 randomly selected students, using simple random sampling technique. The instrument included a five-category Likert-type scale with 44 items.Responses to 28 of the survey's Likert scaleitems were examined, including inter-item correlations and internal consistency (Cronbach's alpha).Exploratory factor analysis was performed to identify domains of students'satisfaction with the services available in the library. It was observed that none of the items were redundant and the scale had appropriate levels of internal consistency (Cronbach's alpha = 0.81). The exploratory factor analysis identified six factors. Factor one,labelled 'environmental conduciveness', explained 10.0% of the variance. Factor two accounted for 8.83% of the varianceand was labelled 'staff courtesy'. Factor three, labelled 'visiting purpose', explained 8.56% of the variance. Factor four accounted for 7.93% of the variance and was labelled 'availability of library facilities' while factor five, labelled 'accessibility of library facilities' explained 7.25% and factor six accounted for 4.94% and was labelled 'service-improvement program'. The instrument demonstrated acceptable library qualities and appears effective in obtaining valid data, which should assist in assessing the library's performance.

Keywords: Library services, Academic performance, Survey instrument, Exploratory Factor Analysis

1.0 Introduction

Libraries are collections of books, manuscripts, journals and other sources of recorded information [1]. A library is a place where any member of the community can come to gather information, look for a book to read so as to advance their knowledge. Successful libraries come in all shapes and sizes but they share certain characteristics that help them operate efficiently, meet the needs of their communities and provide an environment where users of all ages and interests can discover, explore and develop a love for learning and reading. Thus an academic library can be described as the "heart" of the learning community, providing a place for students and faculty to do their research and advance their knowledge. The librarians and library staff provide numerous services to these users, addressing their diverse needs, characteristics, and interests.

The library collections include reference works that provide factual information and indexes that help users find information in Library and information centers; creative works such as poetry, novels, short stories, music scores, andPhotographs; non-fiction, for example biographies, histories and other factual reports and periodical publications, including magazines, scholarly journals, and books published as part of a series, use of CD-ROMs and audiotapes as well as video tapes and other forms of media resources [2]. However, with the advent of online catalogs, CD-ROMs, online data- bases, other electronic

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resources, new methods of document delivery, and access to information, the role of the academic library has begun to change. Students do not have to be physically present in the library in order to access the library's resources. With the Internet and the availability of new technologies and numerous indexes, abstracts, and databases, the range of services that academic libraries can provide has increased dramatically. Users can access the libraries' resources without stepping into the library building. They can also very easily access other libraries' resources, such as online catalogs and unrestricted databases. The Internet has opened the resources of libraries to students and faculty worldwide.Thus, users do not sometimes need a physical library since almost everything can be accessed electronically.

The main aim of every student at a tertiary institution like University is in terms of academic success, hence libraries are set up in these institutions to enhance academic output of students. Several factors contribute to determine Students Academic Achievement in the university. However, the extent to which students use library facilities has not been fully considered to be one of such factors. Thus, this study performed an exploratory factor analysis of a survey instrument assessing the impact of library services on academic performance of students in Federal University of Technology, Minna, Nigeria.

Questionnaires are the most frequently used data collection method in educational and evaluation research. They help gather information on knowledge, attitudes, opinions, behaviors, facts, and other information. Development of a valid and reliable questionnaire is a must to reduce measurement error, where reliability, indicates the accuracy or precision of the measuring instrument [3].

Exploratory factor analysis (EFA) is a multivariate interdependence technique that is widely used in research in the field of administration, especially research of the survey type [4]. It helps to obtain a minimum number of factors that contain the maximum possible amount of information contained in the original variables used in the model, and with the greatest possible reliability. This reduction in the number of variables is desirable when it is intended to submit the data to other multivariate analysis techniques, in which there can be no strong correlations between the independent variables, as is the case with regression techniques, thus generating a more parsimonious model. Although there may be a correlation between these factors, factor analysis guarantees a concentration of the information from the original variables.

1.1 Literature Review

Factors that influence students to actually use the libraries have not been much discussed in literature. Some of the library and information science literature examines library usage and academic success. Other researchers examine library use and instruction, while still others discuss library skills, usage, and grade point average. There has been only few studies focusing specifically on usage of libraries by students. The effectiveness of libraries has often been measured by the volume of library materials available to clients, the amount of use of services and resources, and the apparent or quantified satisfaction of clients;very little research has taken into account the objectives of the clients [5].The author's article deals mostly with library usage of undergraduate students and their academic achievements. She examines the number of times each student visited the library and whether there was any correlation between the library visit, the grades achieved, and the diversity of resources the student used in the library. Her study does not ask the students why they use the library, but what resources and services they used in the library, and the impact these had on their academic success.

Other sources discuss library use by different categories of students. Libraries represent one area in which international students have to adjust. The previous library experiences of these students is a critical determinant of how much adjustment to the United States library system is needed [6]. Some of the reasons why international students used the library include: studying for tests, reading books on reserve, checking out books, using computerized indexes and online facilities, and meeting friends. These library usage characteristics of international students are also pertinent to other students. Providing quality services in academic libraries is now a major issue among academic librarians; they see the library more in terms of the provision of and access to service quality than as just a physical place. Access to information provided by libraries is seen as more important than the materials physically available in a library. The electronic library operates within an electronic collaborative environment with an emphasis on access to information regardless of its location [7].Several factors that influenced user satisfaction have been identified to include responsiveness, competence and assurance (which translated to demeanor), tangibles, and resources [8]. However, these authors did not investigate whether quality services leads to increased usage of the library itself.

2.0 Methodology

The main instrument used for data collection is the developed structured questionnaire. A total of 500 undergraduate students were sampled out of those who regularly use the university library by the simple random sampling technique. This sample consists of 300 and 200, respectively, from the permanent and the temporary sites of the university. Thus, 500 copies of structured questionnaires were administered to the respondents, out of which only a total of 459 questionnaires, representing 91.8 percent, were completed and returned from the two campuses. The instrument included 44 categorical, 5-point Likert-type scaleattitude items as given in TABLE1.

ible 1: 5-point Likert-type scale

ongly Disagree(SD)	Disagree(DA)	Undecided(UD)	Agree(A)	Strongly Agree(SA)
	(2)	(3)	(4)	(5)

hese items were designed to explore students'satisfaction with the services being offered by the university library.

1 Statistical Analyses

ta were checked for missing values or data entry errors. Respondents with missing data were excluded from the study to nimize problems with the identification of factors. Reliability test of the selected items in the questionnaire were then amined. This involved calculating the inter-item correlations, item total correlations and internal consistency (Cronbach's pha) [9]. Any items that had low item total correlations, inter-itemcorrelations, and/or substantially loweredthe internal nsistency were inspected further and if appropriate were excluded. The basic statistic often used in factor analysis is the rson product moment correlation coefficient, which determines the strength of the relationship between two variables, . X and Y. It is given as

$$= \frac{N\sum XY-(\sum X)(\sum Y)}{\sqrt{(N\sum X^2-(\sum X)^2)(N\sum Y^2-(\sum Y)^2)}} \quad (1)$$

ere N is the sample size.

is statistic was used to study the degree of relationship between the variables in the data.Eigen value test was used to ermine the optimal number of factors to extract.We further computed some statistics that enabled us examined the data set was suitable for EFA. We looked at the *Bartlett's Test of Sphericity* [10]. This technique tests the hypothesis that our relation matrix is an identity matrix, which would indicate that our variables are unrelated and therefore unsuitable for ucture detection. Small values (less than 0.05) of the significance level indicate that a factor analysis may be useful with datato confirm that our data has patterned relationships. Then we looked at the *Kaiser-Meyer-Olkin Measure (KMO) of mpling Adequacy* [11]. KMO is a statistic that indicates the proportion of variance in the variables that might be caused by derlying factors. High values (close to 1.0) generally indicate that a factor analysis may be useful with the data. If the value less than 0.50, the results of the factor analysis probably won't be very useful.These results are given in TABLE2.Data ere then subjected to factor analysis using Principal Axis Factoring and orthogonal Varimax rotation.

.1.1 Mathematical Models

e classical factor analysis mathematical model is given by

$$= a_{i1}f_1 + a_{i2}f_2 + \cdots + a_{im}f_m + e_i \quad (2)$$

ere x_i is the i^{th} variable $[i = 1, 2, \ldots, p]$ in vector **x**. There will be p such equations, one for each variable. f_i is the i^{th} factor, d m denotes the number of underlying factors. Hence, this model assumes that there are m underlying factors whereby each rved variable is a linear function of these factors together with a residual variate e_i. A factor loading is the correlation ween a variable and a factor that has been extracted from the data; it gives an idea about how much the variable has ntributed to the factor. For the model 2, the factor loadings are $a_{i1}, a_{i2}, \ldots, a_{im}$ which denotes that a_{i1} is the factor loading i^{th} variable on the first factor.

e computed factor loadings are given by the component matrix in TABLE4. The communalities were then computed, ich are the variances in the observed variables that are accounted for by the common factors; these are summations of the uared correlations of the variables with the factors (i.e factor loadings). Communalities are computed by

$$= a_{i1}^2 + a_{i2}^2 + \cdots + a_{im}^2 \quad (3)$$

ere a equals the loadings for i variables.

e best linear estimate of a variable x_i is given as

$$= a_{i1}f_1 + a_{i2}f_2 + \cdots + a_{im}f_m \quad (4)$$

quation (3) is called the *commonpart* of x_i because this part of the variable has something in common with the other riables as an outcome of their links to the factors [12].

e residual term e_i in model (2) is the sum of two uncorrelated parts, s_i and ϵ_i. That is,

$$= s_i + \epsilon_i \quad (5)$$

ere ϵ_i is *measurementerror* and s_i is specific part of x_i. It contains that part of x_i unaccounted for by the factors and not e to measurement error. Now, by substituting equations (4) and (5) into model (2), we have

$$= c_i + e_i = c_i + s_i + \epsilon_i \quad (6)$$

ne of the assumptions of the factor analysis model given by equation (2) is that all the terms on the right side of equation (6) e uncorrelated, and thus the total variance of a variable x_i can be decomposed into

$$= \sigma_{c_i}^2 + \sigma_{e_i}^2 = \sigma_{c_i}^2 + \sigma_{s_i}^2 + \sigma_{\epsilon_i}^2 \quad (7)$$

ere $\sigma_{c_i}^2$ denotes the common variance, or *communality*. This represents that part of the variance of x_i that is in common h the other variables and is involved in the covariances between them. $\sigma_{e_i}^2$ is the *residualvariance* often referred to as the *iqueness*.It is the variance of x_i unaccounted for by the factors. $\sigma_{s_i}^2$ is the specific variance, or *specificity*, of x_i. It denotes e variance specific to a variable. $\sigma_{\epsilon_i}^2$ is the error variance of x_i due solely to measurement error. This total variance is mputed for each variable and presented in the second column of TABLE3.

3.0 Results and Discussions

Out of 500 questionnaires distributed, a total of completed 459 questionnaires were received. The average age of the sample was 22.5 years (range 19-28 years); about 310 (67.5%) of the sample were female. Most inter-item correlation coefficients were between 0.20 and 0.50, with none exceeding 0.85; this suggests that none of the items overlapped considerably. Most of the item total correlations were also moderate and ranged from 0.45 to 0.70. The Cronbach's alpha for the scale was 0.81, which reflects an adequate level of internal consistency [13,14]. The results of the *Bartlett's Test of Sphericity* and the *Kaiser-Meyer-Olkin Measure (KMO) of Sampling Adequacy* were presented in Table2. From this Table, the p-value for the *Bartlett's Test of Sphericity* is less than 0.05 while the KMO value is 0.841, which is above the cut-off value of 0.50. Indeed these testsshow that we do have patterned relationships amongst the variables. Then we looked at the diagonal elements of the *Anti-image Correlation* matrix that has the '*a*' superscript. By the results of all these tests, our data set is suitable for EFA as the KMO is .84 and the individual diagonal elements of the *Anti-image Correlation* matrix were each> 0.60.

Table 2: KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.841
Bartlett's Test of Sphericity	Approx. Chi-Square	6730.363
	df	946
	Sig.	.000

On the basis of these results, all of the 44 items were included in the subsequent factoranalysis.Principal axis factoring identified a six-factormodel as the optimal factor structure as shown in Table3.

3.1 Factor Extraction and Rotation

The total variance explained by the initial solution, extracted components, and rotated components are computed and given in Table 3:

Table 3: Total Variance Explained

	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
Component	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	7.280	16.545	16.545	7.280	16.545	16.545	4.401	10.003	10.003
2	4.192	9.527	26.072	4.192	9.527	26.072	3.886	8.831	18.834
3	3.041	6.910	32.982	3.041	6.910	32.982	3.768	8.564	27.398
4	2.548	5.790	38.772	2.548	5.790	38.772	3.489	7.929	35.327
5	2.253	5.121	43.893	2.253	5.121	43.893	3.189	7.247	42.574
6	1.594	3.624	47.517	1.594	3.624	47.517	2.175	4.943	47.517
7	1.318	2.996	50.513						
8	1.224	2.781	53.294						
9	1.154	2.622	55.916						
10	1.044	2.373	58.289						
11	.966	2.197	60.485						
12	.951	2.161	62.646						
13	.900	2.045	64.692						
14	.825	1.875	66.567						
15	.822	1.869	68.436						
16	.753	1.712	70.148						
17	.736	1.672	71.819						
18	.714	1.623	73.443						
19	.686	1.559	75.002						
20	.660	1.500	76.502						
21	.655	1.488	77.989						
22	.647	1.470	79.460						

23	.587	1.333	80.793
24	.577	1.311	82.104
25	.569	1.293	83.397
26	.555	1.261	84.659
27	.534	1.215	85.873
28	.484	1.100	86.973
29	.467	1.061	88.034
30	.459	1.044	89.078
31	.447	1.016	90.093
32	.436	.991	91.085
33	.424	.965	92.049
34	.396	.901	92.950
35	.383	.870	93.820
36	.367	.834	94.654
37	.353	.803	95.457
38	.338	.768	96.225
39	.324	.736	96.961
40	.314	.713	97.674
41	.299	.680	98.354
42	.276	.626	98.980
43	.241	.547	99.527
44	.208	.473	100.000

Extraction Method: Principal Component Analysis.

The first section of this table shows the Initial Eigenvalues. The Total column gives the eigenvalue, or amount of variance in the original variables accounted for by each component. The % of Variance column gives the ratio, expressed as a percentage, of the variance accounted for by each component to the total variance in all of the variables. That is

$$\%tage\ variance = \frac{latent\ root}{total\ variance} x100 \quad (8)$$

The Cumulative % column gives the percentage of variance accounted for by the first n components. For the initial solution, here are as many components as variables. However,in this work, we requested that only eigenvalues greater than 1.5 be extracted and so the first six principal components form the extracted solution.

The second section of the table shows the extracted components. They explain nearly 48% of the variability in the original forty-four variables. The factors are arranged indescending order based on the most explained variance.The *Extraction Sums of Squared Loadings* is identical to the*Initial Eigenvalues* except that factors that have eigenvalues less than 1.5 are not shown. These columns give theeigenvalues and variance prior to rotation.

The *RotationSums of Squared Loadings* show the eigenvalues andvariance after rotation. The rotation maintains the cumulative percentage of variation explained by the extracted components, but that variation is now spread more evenly over the components.

3.1.1 The Scree Plot

The scree plot is given in figure 1. This plot helps us to determine the optimal number of components; the eigenvalue of each component in the initial solution is plotted.The components on the shallow slope of the plot contribute little to the solution compared to the components on the steep slope. The last big drop occurs between the sixth and seventh components, so the first six components are optimal.

The factor loadings are given by the component matrix in TABLE4.

Table 4: Component Matrix[a]

	Component					
	1	2	3	4	5	6
1	0.568		0.277	0.226	-0.119	-0.179
2	-0.562	-0.388	0.123		-0.203	
3	0.559	0.39			0.221	
4	0.556	0.41		-0.101	0.124	
5	0.551	-0.285	0.278	-0.49		
6	0.532	0.299		-0.216	-0.193	
7	0.53	0.259		-0.291	-0.199	0.153
8	0.517	0.344		-0.262	-0.189	0.252
9	-0.516	0.262	0.329			
10	0.51	0.434			0.316	
11	0.494	-0.46	0.162	-0.285		0.154
12	0.481	0.241			0.295	0.123
13	-0.468	-0.34	0.2		-0.225	0.303
14	-0.465	0.386	0.29			0.309
15	0.459	-0.334	0.327		0.1	0.278
16	0.448	0.163		-0.343	-0.266	0.298
17	0.419	-0.31	-0.301	0.309		0.196
18	-0.416		0.118	0.255	0.305	0.162
19	-0.404	-0.31	0.281	-0.142	-0.162	0.264
20	0.402	-0.244	-0.393	0.363		0.242
21	-0.294	-0.263	0.185	0.104	0.279	0.1
22	-0.435	0.552	-0.143	0.399		0.228
23	-0.369	0.526		0.38		0.2
24	-0.364	0.495		0.245	-0.186	0.277
25	-0.189	0.475	0.419	-0.211		
26	0.386	-0.465	0.229	0.102	0.328	0.108
27	-0.386	-0.417	0.245	0.103	0.235	
28	0.301		0.506	0.125	-0.144	
29	-0.379	0.31	0.499	-0.241	0.117	
30	-0.346	0.123	0.448		0.172	
31	0.313		0.444	0.165		0.101
32	0.302	-0.215	0.364	0.349		-0.118
33	0.166	0.16	0.366	0.403		
34	0.206		0.327	0.392	-0.325	
35	0.185		0.267	0.388	-0.305	
36	0.299	-0.263	-0.358	0.364		0.208
37	0.333	0.141	0.343	0.355	-0.278	
38	-0.185	-0.195	0.354		0.539	
39	0.39	0.296		0.123	0.479	0.126
40	-0.382	-0.37			-0.457	0.185
41	0.252			-0.114	-0.275	0.397
42	0.353	-0.306	0.159	0.172	0.147	0.389
43	-0.185	0.158	-0.133		0.16	0.369
44	-0.293		-0.203	-0.194	0.281	0.311

Extraction Method: Principal Component Analysis.

a. 6 components extracted

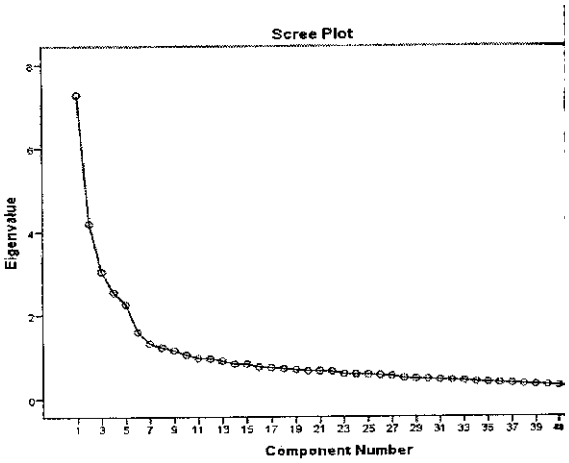

Figure 1: Scree Plot

Table 5: Extracted Factors

Factor	Name
1	Environmental conduciveness
2	Staff courtesy
3	Visiting purpose
4	Availability of relevant facilities
5	Accessibility of library materials
6	Service-improvement programs

Table 6: Factor Structure and Loadings

	Component				
	1	2	3	4	5
10	0.698				
3	0.657				
39	0.657				
4	0.601				
12	0.561				
22		0.844			
23		0.743			
24		0.713			
29			0.722		
25			0.650		
9			0.583		
30			0.529		
16				0.672	
8				0.661	
7				0.620	
6				0.566	
41				0.464	
37					0.64
34					0.622
35					0.581
32					0.581
1					0.571
28					0.545
33					0.538
31					0.448
42					
15					
26					
Eigenvalues	4.40	3.89	3.77	3.49	3.19
% of variance	10.00	8.83	8.56	7.93	7.25

The factor loadings show thatour factors are fairly desirable with at least 3 variables perfactor that are above .32. Data were subjected to factor analysis using Principal Axis Factoring and orthogonal Varimax rotation.

TABLE6 shows our final factor loadings after rotation using a significant factor criterion of 0.3. Items that aren't related and those that measure more than one factor were discarded. Factor1 accounted for 10.00% of the variance. It comprised the following items (in order of decreasing factor loading): 10, 3, 39, 4, and 12. These items related to: the respondent's concerns about the library environment (sufficient work areas to meet the needs of various users; The library environment is a meditative environment; The library environment has space that facilitates quiet study; The library environment is a contemplative environment; and special display areas that invites exploration, discovery and love for learning).As a result this factor was labelled 'environmental conduciveness'. The factors loadingsfor all items were acceptable (0.698- 0.561).

The second factor accounted for 8.83% of the variance and consisted of items 22, 23 and 24. These items assessed the respondents' concern about the library personnel (library personnel are trained and always willing to provide orientation to visitors; library personnel are Employees who deal with users in a caring fashion; and the library personnel are employees who are consistently courteous). As a result this factor was labelled 'staff courtesy'. The factors loadingsfor all items were acceptable (0.844-0.713).

The third factor accounted for 8.56% of the variance and consisted of items 29, 25, 9, and 30. These items assessed the respondents' concern about their aim of visiting the library (I go to library to read lecture notes; I go to library to read newspapers and magazines; I go to library to access online resources; I go to library to consult textbooks and journals). As a result this factor was labelled 'visiting purpose'. The factors loadingsfor all items were acceptable (0.722-0.529).

The fourth factor accounted for 7.93% of the variance and consisted of items 16, 8, 7, 6,and 41. These items assessed the respondents' concern about availability of relevant materials (textbooks are available and adequate in the library; there is complete runs of journal articles; the library has sufficient number of theses and projects; steady and constant internet facility; and online resources are available and adequate). As a result this factor was labelled 'availability of relevant facilities'. The factors loadingsfor all items were acceptable (0.672-0.464).

The fifth factor accounted for 7.25% of the variance and consisted of items 37, 34, 35, 32, 1, 28, 33, and 31. These items assessed the respondents' concern about accessibility of available library materials (available library materials are accessible; available materials are accessible and relevant to my field; library internet facilities are accessible; available online reference materials are accessible; the reserve unit in the library is standard; the circulation unit is standard; there is a functioning binding unit; and library has book lending programs). As a result this factor was labelled 'accessibility of library materials'. The factors loadingsfor all items were acceptable (0.640-0.448).

the sixth factor accounted for 4.94% of the variance and consisted of items 42, 15, and 26. These items assessed the respondents' concern about the available programs for the library to improve on its services to the university community (Interdisciplinary library needs are always being addressed; librarians do regular planning, evaluation and monitoring so as to improve services; and the library develops and manages an inventory of books). As a result this factor was labelled 'service-improvement programs'. The factors loadingsfor all items were acceptable (0.562-0.466).Thus the extracted factor names are (1) environmental conduciveness (2) staff courtesy (3) visiting purpose(4) Availability of relevant facilities (5) accessibility of library materials (6) service-improvement programs, as given in Table5.

The structure of these factors together with their loadings are given in TABLE6.

The extracted factor items are given in TABLE7:

Table 7: Extracted Factor items

Factor	Item No.	Item
	10	sufficient work areas to meet the needs of various users
	3	The library environment is a meditative environment
1	39	The library environment has space that facilitates quiet study
	4	The library environment is a contemplative environment
	12	special display areas that invites exploration, discovery and love for learning
	22	library personnel are trained and always willing to provide orientation to visitors
2	23	library personnel are Employees who deal with users in a caring fashion
	24	the library personnel are employees who are consistently courteous
	29	I go to library to read lecture notes
3	25	I go to library to read newspapers and magazines
	9	I go to library to access online resources
	30	I go to library to consult textbooks and journals
	16	textbooks are available and adequate in the library
	8	there is complete runs of journal articles
4	7	the library has sufficient number of theses and projects
	6	steady and constant internet facility
	41	online resources are available and adequate
	37	available library materials are accessible
	34	available materials are accessible and relevant to my field
	35	library internet facilities are accessible
5	32	available online reference materials are accessible
	1	the reserve unit in the library is standard
	28	the circulation unit is standard
	33	there is a functioning binding unit
	31	library has book lending programs
	42	Interdisciplinary library needs are always being addressed
6	15	librarians do regular planning, evaluation and monitoring so as to improve services
	26	the library develops and manages an inventory of books

4.0 Conclusion

This study involved an exploratory factor analysis of a new survey instrumentto assess the impact of university library services on academic performance of students. This provided a number ofuseful outcomes in the context of thestudy sample. First, the instrument hadacceptable properties withadequate levels of internal reliabilityand no indication ofredundant items. Second, six distinctfactors were identified which werelabelled (1) environmental conduciveness (2) staff courtesy (3) visiting purpose (4) availability of relevant facilities (5) accessibility of library materials, and (6) service-improvement programs. The development of such a valid tool to assess students' level of satisfaction with the university library services is timely as it explores students' level ofanticipation of improved services.

The factor analysis suggests that the information generated by the forty-four items used for the study can be better generated by six underlying constructs: (1) environmental conduciveness (2) staff courtesy (3) visiting purpose (4) Availability of relevant facilities (5) accessibility of library materials (6) service-improvement programs. The instrument shows strong promise in being effective in providing valid data to assist in assessing the performance of the university library.

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