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Association of Demographic Variables versus the Role of the Library in Promoting e-Resources among the Aerospace Scientists and Engineers of Bangalore: A Research Survey

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ABSTRACT

Today, the increasing role of technology in libraries has had a significant impact on the changing roles of the librarians. Newer and newer technologies are dramatically increasing the accessibility of information, and the modern day librarian are adapting to the evolving needs of users that emerge from the adoption of these new technologies Libraries act as a bridge between the knowledge generator and the knowledge user. Demographics is the scientific study of characteristics and dynamics pertaining to the human population, including things like size, growth rate, density and distribution of a specified group. The primary reason people use demography is to create statistics--in fact, the term roughly translates to "people measurement." These allow a person to get a

picture of how common specific traits within a group are. Comparing statistics over time also allows researchers to show changes that are happening in the target group. A research survey was undertaken to ascertain the 'Association of Demographic Variables versus the 'Role of the Library in Promoting e-Resources Usage' among the Indian Aerospace Scientists and Engineers of Bangalore. The major findings of this study are: (a) The $\chi 2$ test indicates that the demographic variable, viz., Occupation ($\chi 2$=42.863, P Value = 0.000), Qualification ($\chi 2$=53.670, P Value = 0.000) and Specialization ($\chi 2$=32.670, P Value = 0.037) by 'Role of the Library in Promoting e-Resources Usage' *have significant association*. This implies that the percentage of preference for the above mentioned demographic variables are not approximately the same *[Not uniformly distributed]*. The $\chi 2$ tests for the remaining demographic variables, namely, Category Wise Distribution [Aerospace Scientist / Aerospace Engineer](P=0.062), Gender, Age-Group(P=0.082) by the 'Role of the Library in Promoting e-Resources Usage' *have no significant association*. This implies that percentages of preference for these demographic variables are approximately the same *[Uniformly distributed]*.

Keywords: Electronic Information Resources, Demography, Aerospace Indexing, Abstracting and Citation Services, Aerospace Scientists and Engineers, City of Bangalore

Abbreviation: PDF – Postscript Document Format, RTF – Rich Text Format, HTML – Hyper Text Markup Language, R&D – Research and Development, $\chi 2$ – Chi-Square, , p-value – Probability Values.

1. INTRODUCTION

The Aerospace industry is not a homogenous industry but it consists of several sub industries: the civilian aerospace industry, the defence or military aerospace industry and the space industry. Each of these industries faces a different industrial structure, a different innovation system and faces different major challenges. In a nutshell, the aircraft industry can be described as a multi-technology sector.

In fact, the Aerospace sector is highly R&D intensive and levels of competition are high. Knowledge production in the Aerospace industry is paramount. It is not only a high-tech industry but also a powerful driver of innovation in the economy as a whole. These Aerospace companies consider forecasting technology and markets and in-house R&D capacities as the most important innovation drivers of the sector (Hollanders et al. 2008).

The twenty–first century libraries do not have a lot in common with the traditional model. Their dominant element is no longer books, but electronic sources of information, including electronic documents, databases, Web resources, e–books and virtual libraries. Most library–related processes are now computerized. Technological development has contributed to facilitating access to the information gathered throughout the world. It has changed methods of communication, and consequently it has altered the tasks to be undertaken by modern libraries. Several studies have indicated that the library acts as a bridge between the knowledge generator and the knowledge user. It is also observed that the role of the librarian is absolutely crucial in the digital environment. Today library users are extremely demanding and have their have their own set of values in relation to access, concerned with identifiable values such as need, level, quality, use, currency and perceived end use or value. Hence, today's library professionals are required to work as facilitators to the end users in catering to their information needs. More so, with the emergence of the Internet the prominence of e-journals is felt greatly even more greatly among the scientists, engineers and technologists (Vishala et al. 2005; Patel, 2012).

2. NEED FOR ELECTRONIC INFORMATION RESOURCES AMONG SCIENTISTS, ENGINEERS AND TECHNOLOGISTS

During the late 1980s and early 90s many new information technologies arose that revolutionized the way in which people searched for and gathered information. More and more publications began to profile the impact that new electronic resources had on different populations. The coming of the Internet itself was the most fundamental shift since Guttenberg's invention of the printing press (Patel, 2001). Somewhere between 1994 and 1996 there was a profound shift in electronic resource usage by scientists. This shift could be attributed to the increase in popularity and usability of the Internet itself as well as the resources it contained. The increase in the use of electronic information resources was attributed to the availability of more and better electronic information resources, desktop access through networked workstations, and user-friendly search engines, (Curtis, 1997). With the coming of the twenty-first century, successful storage and retrieval of the exponentially growing body of scientific information quickly became dependent upon the Internet and the World Wide Web. The way in which scientists seek information to support teaching, research and creative activities is changing as new technologies and information delivery systems emerge. Electronic information resources are obviously an upcoming and endearing activity among all the scientists and engineers irrespective of their disciplines and work environment. On-line access services and the Internet services are the two of the most popular library services in electronic formats today. In this information explosion age, it is practically impossible for an aerospace scientist or engineer to carry out his research work without embracing the network and Internet technologies. They greatly depend upon these electronic innovation tools for accessing electronic information resources in the form of e-journals related to aerospace engineering right at their desktops. In fact, many of the scientists in today's R&D organizations have the unique privilege of downloading full-text e-journals right at their

desktops through their Organization's e-conglomerate. With the coming of age of e-journals, there has been a significant transformation by which scholarly information is disseminated throughout the world. In fact, the arrival of e-journals has greatly affected the way a scientist or an engineer seeks this information, acquires it and uses it effectively (Guruprasad et al. 2011).

3. USE PATTERNS OF ELECTRONIC INFORMATION RESOURCES

Several studies on the influence of the use of electronic information resources on scholarly work have indicated that the use of electronic literature has improved their work considerably in several ways. Today Governments, R&D institutions and Universities invest substantial sums of money for providing scholars with the digital literature they need for their research work with the intention that improved access to electronic information resources will lead to increasing scholarly productivity. The transformation of the physical library to the virtual library probably saves time, since one can access publications from one's desktop. The extent of publications available online combined with easier access has tremendously improved scholar's ability to keep abreast in their field, and perhaps inspire new ideas and ultimately enhance the quality of their work. Several studies on the perceived influence of e-resources on scholarly productivity have indicated that factors like: (a) Easier to find material, (b) Easier to get hold of material, (c) Extended range of material available electronically, (d) Easier to keep updated in one's field of research, (e) Improved quality of work, (f) Inspired new ideas, (g) Greatly saved working time, (h) Reduced time browsing in libraries, (i) Multi-user access, fast access, (j) 24 hour access, (k) Available before print, (l) Multiple file formats for downloading and storing (PDF, RTF, DOC, HTML etc..), (m) Enhanced access and visibility to scientific papers, (n) Keeps current about global R&D etc.. has indicated that the use of electronic resources has considerably influenced the quality of work of the scholars and inspired new ideas to some extent.

4. REVIEW OF LITERATURE

In this study, the authors highlight the fact that, today's environment has brought with it an increased availability of information and communication technology, new formats of information resources, and in particular the growth of the internet. The information landscape has changed fundamentally. Librarians in the new context must to be able to: (a) implement innovative responses in a timely and positive manner, (b) meet users where they are and not wait for users to come to them, (c) change their own behavior to meet changes in client behavior, focus on the user's point of view, not the librarian's point of view, (d) provide services at times and in places which are convenient to users, (e) understand user needs for personalization and categorization, (f) support self-service as well as service in person and online, including online chat, (g) provide the "library to go", visiting users where they need it, (h) adopt marketing approaches to information service delivery, (i) train themselves and others, (j) collaborate and work in partnership with others, (k) provide information via web pages, wikis, blogs or online gateways, and, (l) demonstrate agility, flexibility and an ability to innovate. Today, Libraries are operating in a rapidly changing environment. New promotional and marketing strategies are required to ensure that libraries continue to reach their users and maintain the relevance of their service offerings. Librarians themselves must also change to gain new skills, attitudes and knowledge to operate effectively in this changing environment so that user needs are understood and met (Schmidt, 2007).

Throughout the centuries, the librarian's role has remained unchanged; although the tools and resources used to supply required information and transform it into knowledge constantly change. Especially now, the librarian is indispensable. Therefore, it seems necessary to reflect upon the characteristics of a modern librarian that would best serve all users in the era of the information society. Twenty–first century libraries do not have a lot in common with the traditional model. Their dominant element is no longer books, but electronic sources of information, including electronic documents, databases, Web resources, e–books and virtual libraries. Most library–related processes are now computerized. Technological development has contributed to facilitating access to the information gathered throughout the world. It has changed methods of communication, and consequently it has altered the tasks to be undertaken by modern libraries (Patel, 2012).

The author in his paper stresses the point that, the multimedia nature of the next generation of digital libraries requires the digital librarians (DL) to be essentially a type of specialist librarian who has to manage and organize the digital library, handle the specialized tasks of massive digitization, storage, access, digital knowledge mining, digital reference services, electronic information services, search co-ordination, and manage the archive and its access. The digital librarian acts as guardian of the information superhighway/the universal digital library or the global digital library and acts as a symbiotic human-machine guru (Sreenivasulu, 2000).

Digital technology has revolutionized not only the way information is packaged, processed, stored, and disseminated, but also how users seek and access information. Academic libraries no longer restrict themselves to print services such as collection development, cataloguing and classification, circulation and reference services, current awareness, selective dissemination, and other bibliographic services, but have extended their efforts to interdisciplinary concepts and computer software and hardware and telecommunication engineering and technology (Anunobi, 2008).

Cybrarians or digitarians are just two of the names that have been suggested for the special librarians of the future. Building close partnerships with our customers we can understand their needs and help them successfully. Special librarians who would like to survive this revolution should not only be competent at searching and finding information but should also be fully computer literate and skilled in the use and application of the emerging and cutting edge technologies. The challenges associated with acquiring, organizing, making available, and preserving the information resources required for the support of scholarship and research in special institutions have never been more complex and demanding than they are today. Abundance of information and

variety of modes pose challenges but acceptance and harnessing technological developments by library professionals will help in quenching the quests of information seekers, by redefining the nature, role, services and value of Special libraries (Kumar, 2011).

5. CSIR-NATIONAL AEROSPACE LABORATORIES, BANGALORE

The National Aerospace Laboratories is India's premier civil aviation R&D aerospace research organization in the country. Its main mandate is to 'develop aerospace technologies with strong science content, design and build small and medium – sized civil aircraft, and support all national aerospace programmes'. NAL is also required 'to use its aerospace technology base for general industrial applications'. 'Technology' would be its core engine-driver for the future. NAL is also best known for its main sophisticated aerospace R&D testing facilities which are not only unique for this country but also comparable to similar facilities elsewhere in the world.

6. OBJECTIVES OF THE STUDY

- To determine whether there is any association of 'Demographic Variables by the 'Role of the Library in Promoting e-Resources Usage' amongst the Aerospace scientists and engineers of Bangalore.
- To determine whether the percentage of preference for the demographic variables, viz., (a) Category wise distribution of the respondents [Aerospace Scientist / Aerospace Engineer], (b) Occupation profile, (c) Gender, (d) Age groups, (e) Qualification and (f) Specialization by the 'Role of the Library in Promoting e-Resources Usage' are approximately the same.

7. NULL HYPOTHESIS

There is no association between the 6 demographic variables, namely, (a) Category wise distribution of the respondents [Aerospace Scientist / Engineer], (b) Occupation profile, (c) Gender, (d) Age Group, (e) Qualification and (f) Specialization of the respondents and the 'Role of the Library in Promoting e-Resources Usage'.

Table 1
Distribution of Source Data (Sample Size)

Sl.No.	Organizations	No. of Questionnaires distributed	No. of Questionnaires received	No. of usable questionnaires usable
1.	ADA	67	63	58
2.	AFTC	19	16	15
3.	ADE	14	12	12
4.	ASTE	33	30	29
5.	CABS	16	15	14
6.	CEMILAC	33	30	29
7.	C-MMACS	8	6	6
8.	DARE	11	9	9
9.	LRDE	5	3	2
10.	GTRE	24	22	21
11.	HAL	144	140	134
12.	IAM	40	36	33
13.	ISRO-ISTRAC	25	24	22
14.	IISc	38	37	34
15.	JNCASR	5	3	1
16.	NAL	168	166	164
Total		650	612	583 (89.7%)

Geographical Boundary of the Study (16 Prominent Aerospace Organizations of Bangalore, INDIA)
Key: ADA=Aeronautical Development Agency, **AFTC**=Air Force Technical College, **ADE**=Aeronautical Development Establishment, **ASTE**=Aircraft Systems Testing Establishment, **CABS**=Centre for Airborne Systems, **CEMILAC**=Centre for Military Airworthiness and Certification, **C-MMACS**=Centre for Mathematical Modeling and Computer Simulation, **DARE**=Defense Avionics Research Establishment, **LRDE**=Electronics and Radar Development Establishment, **GTRE**=Gas Turbine Research Establishment, **HAL**=Hindustan Aeronautics Limited, **IAM**=Institute of Aerospace Medicine, **ISRO-ISTRAC**=Indian Space Research Organization, **IISc**=Indian Institute of Science, **JNCASR**=Jawaharlal Nehru Centre for Advanced Scientific Research, **NAL**=National Aerospace Laboratories.

Table 2
Indicates the broad occupational categories from the selected 16 prominent Indian Aerospace Organizations of Bangalore

Sl.No.	Broad Occpupational Categories	Designations / Grades
1.	**Scientific and R&D**	Scientist B, Scientist C, Scientist D, Scientist E, Scientist E1, Scientist E2, Scientist F, Scientist G, Scientist A1, Scientist B1, Scientist C1, Deputy Secretary Grade, Junior Technical Assistant, Scientist/Manager(Inter-Organizational Collaborative Projects)
2.	**Armed Forces**	Doctor, Squadron Leader, Wing Commander, Group Captain, Captain, Lieutenant Colonel, Flight Lieutenant, Major

3.	**Teaching and Research**	Professor, Associate Professor, Assistant Professor, Principal Research Scientist, Senior Scientific Officers, Research Scholars.
4.	**Managerial**	Dy. General Manager Grade-7, Chief Manager Grade-6, Senior Manager Grade-5, Manager Grade-4, Dy. Manager Grade-3, Engineer Grade-2, Assistant Engineer Grade-1.

8. MATERIALS AND METHODS

The present study is restricted to the selected 16 prominent aerospace organizations in Bangalore. A total number of 650 survey questionnaires were distributed amongst the aerospace scientists and engineers belonging to these 16 aerospace organizations. A total number of 612 questionnaires were received back finally 583 (89.7%) were selected for the study which were found suitable for the study. A survey questionnaire has been used to conduct this research study. The total population size of this research study is restricted to the 1220 aerospace scientists and engineers in Bangalore. The distribution of Source Data is indicated in Table 1 to 3. Random sampling technique has been used for selection of the sample size.

Table 3
It shows the broad specialization categories of the selected sample

Sl.No.	Broad Specialization Categories	Details of Specialization
1.	Thermal and Fluid Sciences Comprising of:	Aerospace Propulsion, Fluid Dynamics, Power plant and Fuel Systems, Aerodynamics, Energy Systems, Propulsion, AeroEngines, Fluid Flows, Computational Fluid Dynamics, CFD Software Development, Fluid Mechanics, Thermal Engineering, Gas Turbine Engines, Gas Turbine Engineering, Turbomachinery, Control Propulsion Group, CFD Aerospace, Thermal Power Engineering, Hypersonic Aerodynamics, Fluid Diagnostics, Unsteady Flows
2.	Avionics Guidance and Control Comprising of:	Aerospace Engg., Guidance and Control, FTE (Avionics), Radar Communication, Guided Missiles, Electronical, E & C, Systems Avionics, Engine Control Systems, Electronic Communication, ECE, Embedded Systems, Communication Systems, Communication, Control Engineering, Dynamics Control, Flight Mechanics, Flight Simulation, Modelling and Simulation, Simulation, Electrical and Electronics, Avionics, Parameter Estimation, Digital Signal Processing (DSP), Signal Processing, Instrumentation and Control, Micro Electronics, Control Systems, Satellite Based Navigation, Engine Control Systems, Communication Systems, Aircraft Control, Flight Control
3.	Aerospace Structures and Allied Mechanical Sciences Comprising of:	Aerospace Structures, Aerospace Fatigue Analysis, Structures, Structural Design, Aircraft Structures, Structural Design, Aerospace Design, Weight and CG, Computational Mechanics, Composite Structures, Smart Structures, Aerospace Mechanics, Aircraft Design, Aircraft-Aeronautical Mechanics, Composite Product Development, Stress Analysis, Design, Aero-elasticity, Structural Design, Crashworthiness, Structural Health Monitoring, Composites, Composite Structures, Fatigue and Fracture, Solid Mechanics, Structural Dynamics, Experimental Structures, Structural Vibration and Control, Finite Element Method
4.	Materials and Metallurgy	Comprising of: Aerospace Materials, Alloy Development, Materials Science, Fractography, Failure Analysis, Ceramics, Metallurgical Engineering, Polymer Science.
5.	Flight Operations and Allied Disciplines	Comprising of: Flight Testing, Flight Test Engineer, Flight Test Pilot (FTP), Flying Instructor, Test Pilot, Fighter Pilot, Jaguar Trained, Flying, Maintenance Engineer, Flying, Radar, Antenna/Radar, Test Flying
6.	General Engineering and Support Sciences	Comprising of: Aeronautical Engineering, Human Resource Management (HRM), Mechanical Engineering, Aerospace, Aeronautics, Physics, Oceanography, Trained Aerospace, Production Engineer, Industrial Engineering, SQC Automobile, Industrial Engineering, Aircraft Armament, Computer Science, Aerospace, Aviation Medicine, Aviation Medicine, Aviation Psychology, Aviation Physiology, Physiology, Aerospace Medicine, Aircraft Production Engineering, Engine Assembly, Quality Assurance, Mechanical, CAD, Electro-Magnetics, Rotorcraft, Electrical and Power, Mechanical Electronics, Machine Design, Chemical Engineering, Technical Documentation, Biotechnology, Mechanical Electronics, Microwave Engineering, Manufacturing Engineering, Design Engineering, Production Technology, Manufacturing Engineering, Design and Analysis, Machine Design, Power Systems, Software System, Design, CAE, Project Management, Optical Communication, Neural Networks, Rotary Wing Research, Helicopter Technology, Engineering Design, Earth Science, International Business, Industrial Engineering, Quality Engineering, Chemistry, Digital Logic Designing, Production Engineering, Aircraft Design, Software Development, CSE, Information Science, Aerospace Vehicles, Radar Dynamics, Mechanical Electronics, Instrumentation System

The association of the 6 main Variables of Demography, namely: (a) Category wise distribution of the respondents [Aerospace Scientist / Aerospace Engineer], (b) Occupation, (c) Gender, (d) Age, (e) Qualification and finally the (f) specialization of the respondents by the 'Role of Library in promoting e-resources usage', viz., (1) Well organized home page of library with link to e-journals, (2) Assistance from library staff in handling e-Journals, (3) Library Printed / Online Guide to e-Journals, (4) Library Training / Orientation, (5) Alert service relating to addition of new journals are described in table 4. The detailed percentage distributions of 'Role of the Library in Promoting e-Resources Usage' in comparison with the 6 Demographic variables are indicated in the same table. The analysis of 'Association of Demographic Variables versus the Role of Library in Promoting e-Resources Usage' is shown in Table 4.

9. RESULTS AND DISCUSSION

- The $\chi 2$ test indicates that the demographic variable, viz., Occupation($\chi 2$=42.863,P Value = 0.000), Qualification($\chi 2$=53.670, P Value = 0.000) and Specialization($\chi 2$=32.670, P Value = 0.037) by the 'Role of the Library in Promoting e-Resources Usage' *have significant association.*

- The $\chi 2$ tests for the remaining demographic variables, namely, Category Wise Distribution [Aerospace Scientist / Aerospace Engineer](P=0.062), Gender (χ^2 = 2.841, P=0.585),Age-Group(P=0.082) by the 'Role of the Library in Promoting e-Resources Usage' *have no significant association.*

Table 4
Association of Demographic Variables versus Role of Library in Promoting e-Resources Usage

CATEGORY WISE DISTRIBUTION	Category V/s. Role of Library in Promoting e-Resources Usage					Total
	Not at all Important	Low Important	Moderately Important	More Important	Most Important	
Aerospace Scientist	29 (9.8)	22 (7.5)	53 (18.0)	121 (41.0)	70 (23.7)	295 (100.0)
Aerospace Engineer	46 (16.0)	21 (7.3)	64 (22.2)	92 (31.9)	65 (22.6)	288 (100.0)
Total	75	43	117	213	135	583
Percent	(12.9)	(7.4)	(20.1)	(36.5)	(23.2)	(100.0)
Chi-Square and P Value	χ^2 = 8.962, P=0.062					

OCCUPATION PROFILE	Occupation V/s. Role of Library in Promoting e-Resources Usage					Total
	Not at all Important	Low Important	Moderately Important	More Important	Most Important	
Scientific/ R & D	21 (6.4)	26 (8.0)	65 (19.9)	130 (39.8)	85 (26.0)	327 (100.0)
Armed Forces	18 (22.2)	4 (4.9)	19 (23.5)	20 (24.7)	20 (24.7)	81 (100.0)
Teaching & Research	3 (8.1)	1 (2.7)	10 (27.0)	15 (40.5)	8 (21.6)	37 (100.0)
Managers	33 (23.9)	12 (8.7)	23 (16.7)	48 (34.8)	22 (15.9)	138 (100.0)
Total	75	43	117	213	135	583
Percent	(12.9)	(7.4)	(20.1)	(36.5)	(23.2)	(100.0)
Chi-Square and P Value	χ^2 = 42.863, P=0.000					

GENDER PROFILE	Gender V/s. Role of Library in Promoting e-Resources Usage					Total
	Not at all Important	Low Important	Moderately Important	More Important	Most Important	
Female	12 (16.9)	4 (5.6)	16 (22.5)	21 (29.6)	18 (25.4)	71 (100.0)
Male	63 (12.3)	39 (7.6)	101 (19.7)	192 (37.5)	117 (22.9)	512 (100.0)
Total	75	43	117	213	135	583
Percent	(12.9)	(7.4)	(20.1)	(36.5)	(23.2)	(100.0)
Chi-Square and P Value	χ^2 = 2.841, P=0.585					

AGE-GROUP	Age Group V/s. Role of Library in Promoting e-Resources Usage					Total
	Not at all Important	Low Important	Moderately Important	More Important	Most Important	
21-30	22 (10.5)	21 (10.0)	39 (18.6)	77 (36.7)	51 (24.3)	210 (100.0)
31-40	34 (18.9)	9 (5.0)	35 (19.4)	64 (35.6)	38 (21.1)	180 (100.0)
41-50	14 (10.8)	7 (5.4)	23 (17.7)	53 (40.8)	33 (25.4)	130 (100.0)
51-60	5 (7.9)	6 (9.5)	20 (31.7)	19 (30.2)	13 (20.6)	63 (100.0)
Total	75	43	117	213	135	583

Percentage	(12.9)	(7.4)	(20.1)	(36.5)	(23.2)	(100.0)
Chi-Square and P Value	χ^2 = 19.269, P=0.082					

QUALIFICATION	**Qualification V/s. Role of Library in Promoting e-Resources Usage**					**Total**
	Not at all Important	**Low Important**	**Moderately Important**	**More Important**	**Most Important**	
Doctorate Degree	5 (5.8)	2 (2.3)	13 (15.1)	40 (46.5)	26 (30.2)	86 (100.0)
Masters Degree	24 (9.3)	10 (3.9)	48 (18.7)	111 (43.2)	64 (24.9)	257 (100.0)
Bachelors Degree	45 (19.1)	31 (13.1)	55 (23.3)	62 (26.3)	43 (18.2)	236 (100.0)
Diploma	1 (25.0%)	0 (0.0)	1 (25.0)	0 (0.0)	2 (50.0)	4 (100.0)
Total	75	43	117	213	135	583
Percent	(12.9)	(7.4)	(20.1)	(36.5)	(23.2)	(100.0)
Chi-Square and P Value	χ^2 = 53.670, P=0.000					

SPECIALIZATION	**Specialization V/s. Role of Library in Promoting e-Resources Usage**					**Total**
	Not at all Important	**Low Important**	**Moderately Important**	**More Important**	**Most Important**	
Thermal & Fluid Sciences	5 (5.9)	8 (9.4)	17 (20.0)	34 (40.0)	21 (24.7)	85 (100.0)
Avionics, Guidance and Control	9 (7.8)	10 (8.6)	26 (22.4)	46 (39.7)	25 (21.6)	116 (100.0)
Aerospace Structures and Allied Mechanical Sciences	5 (7.4)	2 (2.9)	11 (16.2)	36 (52.9)	14 (20.6)	68 (100.0)
Materials and Metallurgy	5 (17.2)	3 (10.3)	2 (6.9)	13 (44.8)	6 (20.7)	29 (100.0)
Flight Operations and other Allied Disciplines	9 (19.10	3 (6.4)	13 (27.7)	10 (21.3)	12 (25.5)	47 (100.0)
General Engineering and Support Sciences	42 (17.6)	17 (7.1)	48 (20.2)	74 (31.1)	57 (23.9)	238 (100.0)
Total	75	43	117	213	135	583
Percent	(12.9)	(7.4)	(20.1)	(36.5)	(23.2)	(100.0)
Chi – Square and P Value	χ^2 = 32.670, P=0.037					

Key1: Role of the Library in Promoting e-Resources Usage: (1) Well organized home page of library with link to e-journals, (2) Assistance from library staff in handling e-Journals, (3) Library Printed / Online Guide to e-Journals, (4) Library Training / Orientation, (5) Alert service relating to addition of new journals.
Key: Figures in Brackets indicate Percentages

10. CONCLUSION

The main conclusions that the authors would like to infer in this paper are:

- The $\chi 2$ test indicates that the demographic variable, viz., Occupation ($\chi 2$=42.863, P Value = 0.000), Qualification($\chi 2$=53.670, P Value = 0.000) and Specialization($\chi 2$=32.670, P Value = 0.037) by 'Role of the Library in Promoting e-Resources Usage' *have significant association.*
- This implies that the percentage of preference for the above mentioned demographic variables are not approximately the same*[Not uniformly distributed].*
- The $\chi 2$ tests for the remaining demographic variables, namely, Category Wise Distribution [Aerospace Scientist / Aerospace Engineer](P=0.062), Gender(χ^2 = 2.841, P=0.585),Age Group(P=0.082) by the 'Role of the Library in Promoting e-Resources Usage' *have no significant association.*

This implies that percentages of preference for these demographic variables are approximately the same *[Uniformly distributed].*

SUMMARY OF SURVEY

1.Demographics is the scientific study of characteristics and dynamics pertaining to the human population, including things like size, growth rate, density and distribution of a specified group. The primary reason people use demography is to create statistics--in fact, the term roughly translates to "people measurement." These allow a person to get a picture of how common specific traits within a group are. Comparing statistics over time also allows researchers to show changes that are happening in the target group.

2.In this research survey, the target group happens to be the Aerospace Scientists and Engineers of Bangalore. The association of demographic variables, namely: (a) Category Wise-Distribution of the sample (Aerospace Scientist / Aerospace Engineer), (b) Occupation, (c) Qualification, (d) Specialization, (d) Gender, (e) Age-Group were taken consideration for this study. The inferences show that, (i) Occupation, (ii) Qualification and (iii) Specialization show a heterogeneity pattern (not uniformly distributed) and the rest of the demographic variables, namely: (i) Category Wise Distribution of the Respondents (Aerospace Scientist / Aerospace Engineer), (ii) Gender and (iii) Age-Group show a homogeneity pattern (uniformly distributed) by the 'Role of Library in Promoting e-Resources Usage'.

FUTURE ISSUES

With the advent of the Internet and exponential growth of telecommunication technologies, the world has witnessed exponential growth of digital and virtual libraries. With 24 hour access, instant access and desktop access, modern day scientists and engineers hardly find the necessity to visit the physical library. With information available at your desktop it needs to be seen whether the physical library will eventually face its death. However, some scholars do argue that this may not be necessarily true. Also, it needs to be seen in the years to come whether the role of the library in promoting e-resources usage gradually diminishes as generally scientists and engineers are self-learners and are well exposed to the e-environment and IT due to the nature of their work itself. Hence, the use of electronic information resources is highly expected from them particularly as an integrated information system to their learning and working environment. (This is more so among the aerospace scientists and engineers of Bangalore in the research study conducted by the author).

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