

What is the Knowledge, Attitude and Practice on the Use of INFLIBNET by Indian Subject Experts in Biological Sciences?

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Abstract

The objective of this empirical research is to assess the knowledge, attitude and practice on the use of INFLIBNET by Indian subject experts in Biological Sciences through a Knowledge Attitude Practise (KAP) survey. The survey was conducted among biological scientists and biotechnologists, working in Indian educational institutions. An online questionnaire schedule was pilot-tested and used for collecting data. 600 schedules were sent online, 30 were received, and after cleaning and validating the formats, 14 were used for this analysis. In terms of demographic variables, 86% of the respondents were male with the mean age being 36, and with an average of eleven years of work experience. 71% of the respondents were from educational institutions based in Tamil Nadu; with 80% from the knowledge disciplines of fisheries, aquaculture, zoology and microbiology. 57% of the respondents reported usage of INFLIBNET. The remaining 43% reported a lack of awareness of INFLIBNET. A small sample t-test found that age was a significant factor in the use of INFLIBNET. Amongst users, Shodhganga (ETD) was ranked first and used by all respondents. The preferred search option was "keywords" 63% had attended generic training programmes for internet search. Non-users were usually male, more than 37 years of age, with more than ten years of work experience, with a doctoral degree, with unsatisfactory digital infrastructure in their workspace. A targeted extension program, focusing on librarians working within these biology/biotechnology institutions is recommended for increasing awareness and usage of INFLIBNET including ETD (Shodhganga).

Keywords: Aquacultures, Attitude, Biochemistry, Biological Sciences, Biotechnology, Botany, Digital Literacy, Electronic Theses and Dissertations (ETD), Fisheries, INFLIBNET, Knowledge, Microbiology, Practice (KAP) Survey, Shodhganga

1. Background

The Information and Library Network (INFLIBNET) Centre, Gandhinagar is an autonomous Inter-University Centre (IUC) of the University Grants Commission (UGC), sponsored by the Ministry of Education, Government of India, New Delhi. The INFLIBNET Centre was initiated in February 1991 as a project under

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the Inter-University Centre for Astronomy and Astrophysics (IUCAA). It became an independent library sciences resource centre in May 1996. The INFLIBNET Centre is involved in electronic networking and modernizing university libraries in India using state-of-the-art technologies.

1.1 Disseminating Research Information

The INFLIBNET Centre provides a platform for subject experts to disseminate their research findings to a wider audience through “Shodhganga”: a digital repository of Indian Electronic Theses and Dissertations. This database has around 4.75 million collections, across many subjects. “ShodhGangotri”, is a digital repository of approved synopsis submitted by research scholars to the universities for registering for a doctoral programme. Around 12.5 thousand collections are available in this database.

1.2 Overview of World Digital Collections of Thesis & Dissertation

There are many digital collections of theses and dissertations (ETDs) in the world (Roy, 2017). A brief overview of some of the known collections are as under:

- ❖ **ProQuest Dissertations & Theses Global:** This is the world’s largest collection of theses and dissertations, with over 80 million records. It includes theses and dissertations from universities in over 100 countries. ProQuest is a subscription service, but it offers a free trial.
- ❖ **Networked Digital Library of Theses and Dissertations (NDLTD):** This is a consortium of over 1,000 academic institutions that have agreed to make their theses and dissertations available online. The NDLTD archive contains over 6 million theses and dissertations. The NDLTD is free to use.
- ❖ **Open Access Theses and Dissertations (OATD):** This is a directory of open access theses and dissertations from over 1,100 universities around the world. OATD currently indexes over 6.5 million theses and dissertations. OATD is free to use.
- ❖ **British Library EThOS:** This is a database of theses and dissertations from British universities. EThOS contains over 2.5 million theses and dissertations. EThOS is free to use for UK-based researchers.
- ❖ **ERIC Theses and Dissertations:** This is a database of theses and dissertations that have been funded by the US Department of Education. ERIC Theses and Dissertations contains over 1.5 million theses and dissertations. ERIC Theses and Dissertations is free to use.

2. Statement of the Problem

For the discipline of library science, digital/ electronic databases of thesis and dissertations, (ETD) is an innovative and new program involving the use of state-of-the-art electronic/information technology. Periodical assessment of the effective usage and difficulty faced in finding required information by the users (students, professionals, teaching professionals and research scholars), is perhaps useful to enhance the utilisation.

There are many generic studies conducted on awareness and use of institutional repositories similar to ETD. Specific discipline/knowledge domain/ subject studies appear to be rare. Specifically, the discipline of the biological sciences, (including allied biotechnologies), seems to be neglected. Therefore, a small exploratory study has been conducted to assess the level of awareness and usage by biological scientists and biotechnologists. The targeted population include the knowledge domain/subjects of biology, botany, zoology, biotechnology, biochemistry, fisheries and aquaculture. The survey focus is on educational organisations in India. The statement of the problem is

“What is the Knowledge, Attitude and Practice on the Use of INFLIBNET by Indian Subject Experts in Biological Sciences?”

3. Review of Literature

Simmonds & Andaleeb (2001) stated that libraries were facing competition from different information providers, which were widely available. The rising cost of books and journals (both print and electronic) and emerging new information technology resources providing information to potential library users, “raise questions about the role of academic libraries in present times.” Service quality factors, resources, and user characteristics had to be taken into account for redefining the role.

Vijayakumar et al., (2007) in their empirical study of 27 Indian universities found that 39% of the doctoral research supervisors across disciplines were unaware of INFLIBNET. Among doctoral students, 43% were unaware of INFLIBNET. Sethi & Panda’s (2012) empirical study of 64 life scientists and faculty members from Sambalpur University reported that only 1.56% of the respondents were frequent users of the ETDs in the disciplines of biotechnology and biochemistry. The researchers pointed to the lack of appropriate training for users to access e-resources as one of the major constraints to the effective use of e-resources.

Goharinezhad et al., (2012) in their empirical study of 150 medical scientists in Tehran University, Iran, found that 36% did not have knowledge of their ETD database. Bhat & Ganai (2017) studied the user satisfaction of the KrishiPrabha full-text database of Indian Agricultural Science doctoral dissertations, which has a collection of 10,500 dissertations, contributed by 1,200 faculty, scientists and research scholars. A majority of respondents (60.33%) reported satisfaction with the availability of e-theses. 29.33% of the users were dissatisfied. They, however, assessed that index and abstract databases, e-books, and e-theses are not quite adequate to meet their requirements, which seemed to indicate a lack of awareness among the agricultural scientists of the facilities that can be added to ETD. Tom & Balachandran (2018) studied 144 faculties of Kerala University and found that 44% had no knowledge of INFLIBNET. Another empirical study across departments in Assam University by Sinha & Purkayastha (2018) studied awareness and use of ETDs with special reference to Shodhganga and Shodhgangodri among 104 faculty and research scholars in Assam University, Silchar. They observed that 58.65% and 41% of respondents were fully aware and partially aware, respectively. 24.0% of respondents said that they are not able to use the ETD databases on account of a lack of awareness and a lack of training and awareness programmes.

Siwach & Malik (2019) investigated the use of electronic resources by 668 science faculty and research scholars in five universities in northern India. They observed that awareness of e-resources mainly came through browsing or looking for materials. The use of e-resources happened through self-learning. They also observed that less than one-fourth of users had attended training in the use of e-resources. They suggested conducting more training programmes for its optimum utilisation. Veeramallu et al., (2021) investigated the use of projects and theses among 705 engineering college faculty members in Krishna District, Andhra Pradesh. 40% of the respondents were visiting libraries to access ETDs. Less than 2% of the respondents stated inadequate hardware availability as a problem. 61% stated that to solve the problem of the non-availability of dissertations, they suggested developing technological infrastructure and conducting orientation and training programmes for engineering faculty to increase the availability and usage of e-resources. Ankita (2021) found that four of the top ten contributing universities to the Shodhganga were from Tamil Nadu.

Roy (2017) studied the development of the electronic theses and dissertations (ETDs) movement in India and narrated a brief history of ETDs, and similar major initiatives across the world. He discussed the history, objectives and importance of ETDs, including NDLTD-USA, ADT-Australia, EThOS project-UK, DART-Europe, Cypertheses-France, DATAD-Africa, KIPS-Kenya and Theses online-Germany.

Gupta & Gupta (2014) evaluated Indian digital repositories, including ETD, studied the guidelines issued by various government bodies for acceptance of ETDs and browsed various registries and directories of open access repositories (OpenDOAR). The authors suggested that for effective usage of ETDs, Indian universities need to work on the organisational task of accessing current ETDs. They also recommended training and workshops for potential users (the researchers, faculty, thesis evaluators, and librarians) to make them aware of the facilities available in ETDs. Across time, knowledge disciplines, and geography, it appears that lack of awareness of ETD is a major factor affecting utilisation. Hence, this study attempted to assess whether this continued to be so in 2023.

4. Objectives

The specific objectives of the study are:

- ❖ To investigate the demographic background of the biological and biotechnological subject experts in India,
- ❖ To assess the level of awareness of INFLIBNET resources,
- ❖ To assess user satisfaction with INFLIBNET,
- ❖ To appreciate the differences between users and those who are not aware of INFLIBNET,
- ❖ To appreciate the attributes of non-users and their self-perception regarding digital information access, and

- ❖ To explore extension programme strategies targeting biological scientists and biotechnologists for increasing awareness and usage of INFLIBNET resources.

5. Methods

A Knowledge, Attitude, and Practice (KAP) survey is a study of a representative sample of a targeted population, to collect information on what is known, believed and acted upon: for an implemented/delivered program.

This study attempted a Knowledge, Attitude, and Practice (KAP) survey of INFLIBNET with a small sample of biological scientists and biotechnologists, working in research and teaching organisations across India. Simple statistical analysis was attempted to validate the research hypothesis around awareness of ETD/INFLIBNET's "Shodhganga". For users, the study investigated the perception of the comfort level with INFLIBNET along with a ranking of the services used. The study also investigated experiences with digital literacy training programs and openness to receiving training on INFLIBNET.

5.1 Data Collection

Data for this KAP survey was collected using a structured, standardised questionnaire schedule that was generated through an iterative process of testing and refining. The schedule consisted of eight sections and 36 questions. It was pilot-tested and administered online.

The target population for the study was scientific professionals and faculty members of biological sciences and biotechnologies, including biology, microbiology, botany, zoology, biotechnology, fisheries, and aquaculture disciplines. The online questionnaire schedule was mailed to around 600 subject-specific professionals. 30 responses were received from the end of May to the end of July 2023. After screening and cleaning the respondent schedules, 14 responses were validated for the study.

Demographic information (age and sex) and professional background (education, years of work experience) were collected to understand differences between users and non-users of INFLIBNET. The schedule collected contextual information on the profiles of users and non-users in terms of demographics and education (age, sex, and educational qualifications): affiliation to educational institution and to department: subject areas and number of years of work experience.

For those respondents who stated that they were aware of and using INFLIBNET, information was collected on the respondent's perceptions about knowledge and use of specific INFLIBNET services, including a ranking of the services used. Information on the perception of satisfaction with the user experience and comfort level with the use of specific metadata fields was collected. Information was also collected on training received in information retrieval from internet search engines, including INFLIBNET.

A five-point Likert scale was used to ascertain self-perception regarding difficulties faced in accessing digital information in the workspace.

5.2 Methodology of Analysis of Survey Data

The filled-in formats were analysed for simple descriptive statistics for the demographic variable of age, and simple descriptive statistics were calculated (Gupta, 2014; Srivastava et al., 1983).

- ❖ measures of central value (arithmetic mean, median, and mode)
- ❖ and measures of dispersion (range, arithmetic deviation, variance, and standard deviation)

Graphs were added to further clarify the nature of the data analysis. The respondents were then sorted in terms of those who were aware of and using INFLIBNET and those who were NOT aware of INFLIBNET services. Enumeration and classification of data were attempted for variables like number of years of work experience, educational qualification, and professional designation. These variables were sorted in terms of two categories: users and those not aware of INFLIBNET and presented as simple tabulations.

After checking if the collected data could be approximated by the normal Gaussian curve, a SMALL SAMPLE TEST was used to test for the significance of the difference in the mean. For the demographic variable of age, the statistical parameter, the arithmetic mean of the age of respondents, was used to analyse if there was a significant difference. The null hypothesis used for this test was:

Ho: There is NO significant difference in age between respondents who are aware and not aware of INFLIBNET.

From the subset of respondents who were aware of and accessing INFLIBNET, the information collected was used to generate a perception ranking in terms of usage of the services provided, and of query options used.

From the subset of respondents who were NOT aware (and hence non-users) of INFLIBNET, an attempt was made to understand their attributes in terms of the variables used in the study. Their self-perception on difficulties faced in accessing digital information in the workspace was tabulated and analysed: to appreciate attitudinal issues.

6. Statistical Analysis and Results

6.1 Descriptive Analysis of Variables of Gender, Age, Knowledge Domain, Location and Educational Qualifications

Most of the respondents (12/14 or 86%) were male. The below tables (Table 1 to 4) and the pie diagram (Figure 1) present the data. 86% of the respondents were male.

Table 1: Number of Respondents by Demographic Variable of Gender

Gender	Responses	%
Male	12	86
Female	2	14

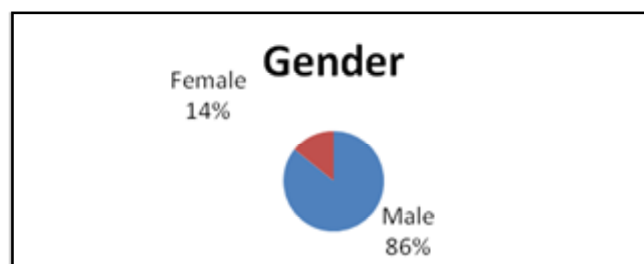


Figure 1: Number of Respondents by Demographic Variable of Gender

Table 2 presents the raw data arrayed in an ascending order of the age of respondents. Figure two presents the data in a histogram.

Table 2: Number of Respondents by Demographic Variable of Age

Age wise response	28	29	31	37	38	39	40	43	45	48
No. of respondents	2	3	1	2	1	1	1	1	1	1

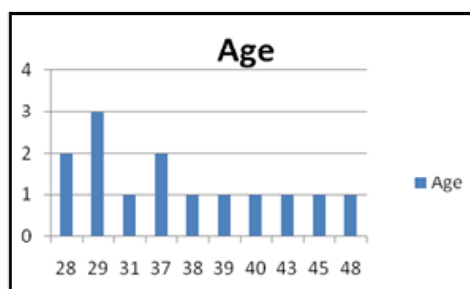


Figure 2: Number of Respondents by Demographic Variable of Age

Since age appeared to be a crucial variable in determining the knowledge and use of INFLIBNET, a more detailed descriptive statistical analysis on the demographic variable of age was attempted, which is presented in Table 3.

Table 3: Descriptive Statistics for the Demographic Variable of Age (n=14)

Statistical parameter	Value
Population (n)	14
Mean (x)	35.79
Median	37
Mode	29
Arithmetic Deviation	5.79
Variance (sigma square)	43.21
Standard Deviation (sigma)	6.57
Coefficient of Variation (C.V.)	0.18
Skewness (Pearson)	1.06

The data seems to reveal a moderate and positively skewed distribution, with the mean and median age clustering around 36 years. The standard deviation of around 6 years, results in a moderately low coefficient of variation of 0.18

Table 4: Number of Respondents by State and Discipline

States Subject	Tamil Nadu	Kerala	Andaman	Total
Aquaculture	0	1	1	2
Biochemistry	1	0	0	1
Biotechnology	1	0	0	1
Botany	0	0	1	1
Fisheries	3	1	0	4
Microbiology	2	0	0	2
Zoology	3	0	0	3
Total	10	2	2	14

- ❖ The respondents were distributed across three states of India: Tamil Nadu, Andaman and Kerala. The majority of the respondents are from Tamil Nadu (71%).
- ❖ 80% of the respondents were from the disciplines/knowledge domains of Fisheries, Aquaculture, Zoology, and Microbiology.

6.2 Comparison of the Samples Across the Two Categories: Those Aware of and Not Aware of INFLIBNET Using Age as a Variable

The questionnaire schedules were sorted in terms of the two categories of those aware and those not aware of INFLIBNET, using age as a variable. A simple comparative analysis was attempted for these two categories. The descriptive statistics of these two categories (presented in Table 5) seem to show some significant differences in these two categories, especially for the arithmetic mean.

Table 5: Descriptive Statistics of the Demographic Variable of Age of the Two Categories – Users and Not Aware

Statistical parameter	Formula	Total	Users	Not Aware
Population (n)		14	8	6
Sigma (Σ)		501	266	235
Mean (\bar{x})	$(\Sigma) / n$	35.79	33	39
Median		37	30	40
Mode		29	29	None
Arithmetic Deviation	$(\Sigma)(xi - \bar{x}) / (n)$	5.79	5	4.5
Variance ((σ^2))	$((\Sigma)(xi - \bar{x})^2) / (n)$	43.21	32	37
Standard Deviation (σ)	$\sqrt{\sigma^2}$	6.57	5.7	6.1
Coefficient of Variation(C.V.)	$((\sigma) / \text{Mean}(\bar{x}) * 100$	18%	17%	16%
Coefficient of Skewness (Pearson)	$(\text{Mean} - \text{Mode}) / \sigma$	1.06	0.8	6.5 (using empirical mode)

Since there appeared to exist differences in the mean age, a small samples test was used to test the significance of this difference.

6.2.1 Educational qualification

There did not appear to be much of a difference in the educational qualifications of users and non-users.

Table 6: Educational Qualifications of the Respondents

	PhD Pursuing	Ph.D.,	PG	TOTAL
Users	4 (50%)	3 (37%)	1 (13%)	8(57%)
Not Aware	2 (33%)	4 (66%)	0	6(43%)
TOTAL	6 (43%)	7 (50%)	1(7%)	14 (100%)

6.2.2 Designation

There did not appear to be much of a difference in the designation of the users and non-users.

Table 7: Designation of the Respondents

	Asst. Professor	Scientific professional	Total
Users	3 (21%)	5 (36%)	8 (57%)
Not Aware	3 (22%)	3 (22%)	6 (43%)
Total	6 (43%)	8 (57%)	14 (100%)

6.2.3 Work experience

Table 8 provides the raw data of the age of the respondents, classified in terms of Users and non-users. Figure 3 provides a graphical representation of the data.

Table 8: Number of Years of Work Experience

Experience (year wise response)	Work Experience (years)											Response & %	Mean
	1	2	3	5	6	10	11	13	14	23	25		
Users	1	1	0	2	2	1	0	0	1	0	0	8 (57%)	8.5
Not Aware	0	0	1	0	0	1	1	1	0	1	1	6 (43%)	14.6
	1	1	1	2	2	2	1	1	1	1	1	14 (100%)	1093

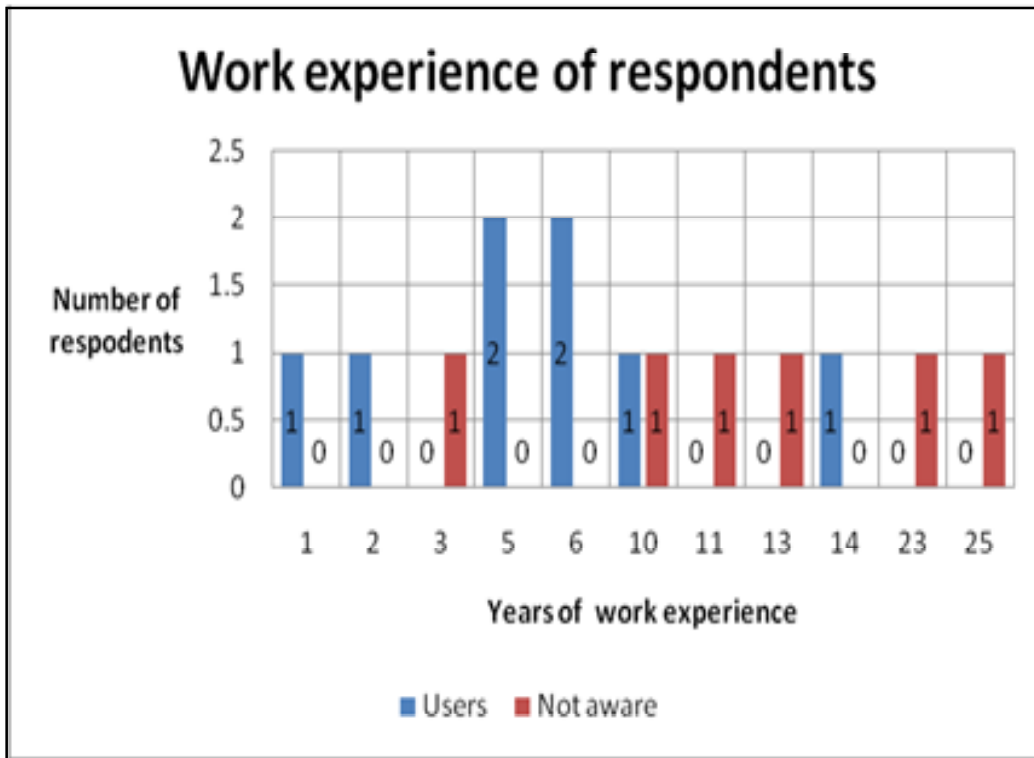


Figure 3: Work Experience of Respondents in Terms of Users and Not Aware of INFLIBNET

Users seem to have less work experience, and non-users (not aware) more years of work experience. Simple descriptive statistical analysis was attempted to explore these differences,

Table 9: Descriptive Statistics of the Demographic Variable of Work Experience

Statistical parameter	Formula	Users	Not Aware
Population (n)		8	6
Sigma (Σ)		49	85
Mean (\bar{x})	$(\Sigma) / n$	6.1	14
Median		5.5	12
Mode		5,6	8 (empirical mode)
Arithmetic Deviation	$(\Sigma)(xi - \bar{x}) / (n)$	2.9	6.2
Variance ((σ^2))	$((\Sigma)(xi - \bar{x})^2) / (n)$	16	63
Standard Deviation (σ)	$\sqrt{\sigma^2}$	4	7.9
Coefficient of Variation	$((\sigma) / \text{Mean}(x)) * 100$	64.81%	56.00%
Coefficient of Skewness (Pearson)	$(\text{Mean} - \text{Mode}) / \sigma$	0.03	0.77 (using empirical mode)

6.3 Identifying the Probability Distribution of the Demographic Variable of Age of Respondents

The total range of the age of respondents was 28 to 48. As per an empirical rule of the property of the Normal Gaussian curve:

- ❖ The range defined by Mean \pm one standard deviation would constitute around 68%.of the observations
- ❖ The range defined by Mean \pm two standard deviation would constitute around 95%.of the observations

Rounding off, the mean age (\bar{x}) of the total number of respondents was around 36 years and the Standard Deviation (σ) was around 7 years.

$$\text{Mean} \pm \text{One Standard deviation} = 36 \pm 7 = 29 \text{ to } 43 \text{ years}$$

From the scatter diagram (figure 3) we can observe that 10/14 data points are in this range. This would be around 71% of the total number of respondents.

$$\text{Mean} \pm \text{Two Standard deviation} = 36 \pm 14 = 22 \text{ to } 50 \text{ years}$$

From the scatter plot, we can observe that all the data points (100%) are in this range.

We can possibly infer that the probability distribution of the demographic variable of age of respondents appears to follow the Normal (Gaussian) curve?

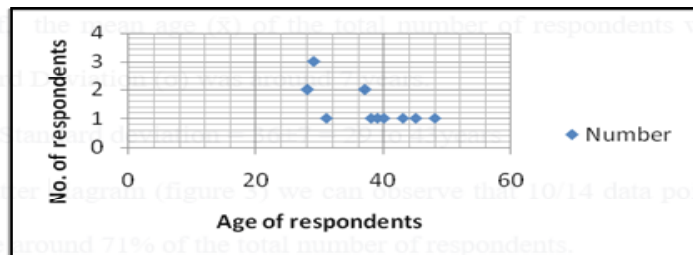


Figure 4: Scatter Diagram of Demographic Variable of Age

6.4 Test of Significance of Difference of Sample Means for the Two Categories

With the assumption that the parent population is approximated by the Normal (Gaussian) probability distribution, we can apply standard inferential statistical tests of the significance of means. Since the sample size is considered small (n=14) the ‘t-test’ of the significance of the difference of means can be used. The probability density function (pdf) of the t statistic is given by:

$$f(t) = \frac{\Gamma(\frac{\nu+1}{2})}{\sqrt{\nu\pi} \Gamma(\frac{\nu}{2})} \left(1 + \frac{t^2}{\nu}\right)^{-\frac{\nu+1}{2}}$$

Γ = Gamma function
 ν = degrees of freedom
 π = $\approx 3.14159\dots$, the ratio of a circle's circumference to its diameter

Where,

$$-\infty < t < \infty$$

The null hypothesis used for this test:

H₀: There is NO significant difference in age between respondents who are aware and not aware of INFLIBNET.

The alternative hypothesis used:

H₁: There is a SIGNIFICANT DIFFERENCE in age between respondents who are aware and not aware of INFLIBNET.

The Student's t-test statistic is calculated by the following formula:

$$t = \frac{(\bar{x}_1 - \bar{x}_2) / S}{\sqrt{\frac{1}{n_1} + \frac{1}{n_2}}}$$

where S, combined standard deviation = $\sqrt{\frac{\sum (X_1 - \bar{x}_1)^2 + \sum (X_2 - \bar{x}_2)^2}{n_1 + n_2 - 2}}$

Where S = Combined standard deviation

\bar{x}_1 = Mean of the first sample

\bar{x}_2 = Mean of the second sample

n_1 = Number of observations of the first sample, n_2 = Number of observations of the second sample. Applying the observed values, for the two samples we get.

The combined standard deviation S = 6.3. Applying the t-test to the observed values we get **t = 1.73**, Tabulated t for 12 degrees of freedom at 0.20 significance is 1.35. Calculated t (1.73) > Tabulated t (1.35)

6.4.1 Result of Test of Significance of Difference of Sample Means

The difference in means is significant at a 0.20 level of significance. We can thus reject the null hypothesis, and make a probabilistic conclusion that:

- ❖ There is a significant difference in the mean ages between the categories of biological scientists/ biotechnologists, who are aware of INFLIBNET and those who are not aware”.

6.4.2 Knowledge, and Use of INFLIBNET Services (n=8)

Users of INFLIBNET were further analysed in terms of their knowledge and access to specific services offered and their ranking in terms of usage. (See table 10)

- ❖ Shodhganga (ETD) had the highest ranking and was used by all respondents, followed by IR@INFLIBNET and Shodhsindhu, respectively.

Table 10: Use and Ranking of INFLIBNET Services

Services offered	Number accessed (out of 8)	Overall Ranking
Shodhganga	8 (100%)	First
Shodhgangotri	3 (37%)	Third
IR @ INFLIBNET	3 (37%)	Second
IRINS	5 (63%)	Fourth
VIDWAN	3 (37%)	Fifth
SHODHSINDHU	4 (50%)	Sixth

6.4.3 Perception/Attitude to INFLIBNET Services

The perception of their online experiences on the use of INFLIBNET was analysed.

- ❖ Most of the respondents 7 out of 8 (88%) shared their experiences of accessing INFLIBNET with their colleagues.
- ❖ Three-fourths of the users rated the INFLIBNET user experience as very good or good. (See Table 11)

Table 11: Perception of INFLIBNET Usage Experience

	Very good	Good	Satisfactory	Below Average	Poor	Total
Rating of INFLIBNET experience	4(50%)	2 (25%)	2(25%)	0	0	8
Comfort level in using metadata key fields	5(62%)	2(25%)	1(13%)	0	0	8

- ❖ Almost all the respondents (87%) stated a good comfort level in using metadata key fields. (See Table 11)

- ❖ Keywords and subjects were the most preferred search option, (87%) Keywords were the most used (first in ranking). The search option institution was ranked second (see Table 12)

Table 12: Preferred Search Option

Search Option	Number responded (out of 8)	Overall Ranking
Keywords	7 (87%)	First
Year	5(63%)	Fourth
Institution	5(63%)	Second
Subject	7(87%)	Third

- ❖ The query option of SEARCH was perceived to be most related to their queries. The option of and/or /not seem to be less related to the queries of the users (see Table 13)

Table 13: Satisfaction with Query Options

Query option	Most related	Somewhat related	Related	Unrelated	Completely unrelated
Search	4	3	0	0	0
Advanced search	1	2	2	0	0
And / or / not	0	0	2	1	1

6.5 Training and Orientation Programmes

The training and orientation programmes received on online search were analysed. A majority of the users (63%) had received training on online search.

- ❖ Most (87%) had received no specific training for INFLIBNET. There was a divided opinion among users on attending an INFLIBNET training programme.

Table 14: Training and Orientation Programmes

	Yes	No	Total
Attended training programs on internet search	5(63%)	3(37%)	8(100%)
Attended training programs on INFLIBNET	1(13%)	7(87%)	8(100%)
Interested in attending INFLIBNET usage programme	4(50%)	4(50%)	8(100%)

6.6 Attributes of Respondents not aware and hence non-users of INFLIBNET (n=6)

6.6.1 Association of Attributes

The data collected from respondents who were “non-users”, was analysed to attempt to understand if there were common attributes in their responses.

Table 15: Attributes of Non-users of INFLIBNET (n=6)

Attribute	Description	Remarks
Gender	Male	All non-users were male
Age	Usually >37 years of age	Significant difference in age
Work experience	Usually more than ten years	Almost all the non-users(5/6) had more than ten years of work experience
Education institution affiliation	Tamil Nadu Government Fisheries colleges, RGCA	Respondents from both Government fishery colleges in Tamil Nadu and half of RGCA respondents were not users
Education	Usually a doctorate	4/6 respondents were doctorates
Digital infrastructure at work space (non RGCA)	Unsatisfactory – obsolete computers, erratic power supply. In one case, the institution did NOT have digital access in the work space	
Not possessing personal digital device (computer/laptop/etc.)	Possible	1/6 did not possess personal computer (belonged to RGCA)

6.7 Self-perception on Problems in Accessing Digital Information in the Workspace

A 5-point Likert scale was used to assess the self-perception of problems in accessing digital information in the workspace, among non-users which is presented in Table 16.

There seemed to exist a perception that restrictions on downloading was a problem.

There seemed to be a degree of perceptual agreement that the following were NOT problem areas:

- ❖ Online compilation of information did NOT appear to be a problem,
- ❖ Sub-division of subjects did NOT appear to be a problem,
- ❖ Non-inclusion of allied and new subjects did NOT appear to be a problem,
- ❖ Online location of the subject did NOT appear to be a problem, and
- ❖ Slow loading of site/page did NOT appear to be a problem.

Table 16: Responses to Question on “What are the Problems You Face in Digital Information Retrieval in your Workspace?”

Statement	Completely agree	Partially agree	Neither agree or disagree	Partially disagree	Completely disagree
Proficiency in using technology/resources is less	1	2	0	1	2
Finding information is hard	0	2	2	0	2
Information is NOT compiled in one place	0	0	3	1	1
Restricted to download	1	2	1	0	2
Search is giving complicated/complex results	0	2	2	0	2
Subdivision of main subjects are NOT properly categorised	0	2	1	1	2
Allied and new subjects are NOT included	0	1	2	2	1
Unable to locate the required topics	0	1	2	1	2
Loading the site/page is slow	0	2	1	0	3

- ❖ There seemed to be divided perceptions for the following problem areas: proficiency in the use of (information) technology and difficulty in finding information.

6.8 Institutional Affiliation of Respondents

To investigate whether educational institutional affiliation could be a characteristic of non-users, all the respondents were classified into four broad categories.

Table 17: Education Institutional Affiliation

Institution	Users	Not aware	Total
Tamil Nadu Government Fisheries Institutes	0	2	2
Kerala Government Fisheries Institutes	2	0	2
RGCA	4	3	7
Tamil Nadu Arts and Science Colleges	2	1	3
Total responses	8	6	14

- ❖ As can be seen in Table 17, half of the respondents (7/14) were from RGCA and all the RGCA respondents reported high satisfaction with the digital infrastructure in the workspace. However, 3/7 were NOT aware and not using INFLIBNET. Both the respondents from Tamil Nadu government-sponsored fishery colleges were non-users.

7.0 Conclusion of Empirical Study

The hypothesis that a significant minority of the intended users in the knowledge domain of biological sciences and biotechnology had NO knowledge of INFLIBNET's ETD seems validated (43% of respondents). This trend seems to persist across time, across geography and across biological knowledge disciplines.

Digital infrastructure (both hardware and software) did NOT appear to be a serious constraint in accessing ETD/ Shodhganga of INFLIBNET.

The survey data appears to point to the need for a skill-building programme to build digital skills and the relevant attitudes in the use of ETD (Shodhganga) in INFLIBNET. This programme could target those biologists and biotechnologists who are male, more than 37 years of age, have more than ten years of work experience with a doctoral degree, and have unsatisfactory digital infrastructure in their workspace. National-level aquaculture institutions like RGCA (which reported a high degree of satisfaction with digital infrastructure at their workspace) could possibly require a different sort of skill-building programme for increasing awareness and use of INFLIBNET.

7.1 Implications for Action for Library Scientists

Library scientists working within these biology educational organisations can be “delivery agents for an awareness generation and skill building programme of INFLIBNET services”. They can play the role of “extension agents” for disseminating, generating awareness, and technical skill-building packages.

In terms of immediate action, a campaign to identify and recruit library scientists/librarians in situ (within) biological educational organizations who are interested in volunteering their time for this educational cause; can be started. These library scientists can be trained through a “Training of Trainers” (ToT) programme on educating biological scientists/biotechnologists on accessing and using INFLIBNET. These orientation and skill-building programmes can then perhaps be pilot-tested in the biological educational organisations where these master trainer library scientists/librarians work. Based on the review and learnings from these pilot experiments, which can be conducted across many locations and educational organisations, a program for scaling up can be envisioned.

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