

## WEB PRESENCE OF NATIONAL LEVEL DIVYANGJAN INSTITUTES OF INDIA: A WEBOMETRIC STUDY

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### ABSTRACT -

The present study makes a specialty of the web presence and visibility of websites of National level Divyangjan Institutes of India. Using some webometric indicators like total web-page count, inlinks, outlinks, Google scholars, number of rich files, bounce rate, etc. The paper attempts to depict the web presence of said institutional websites. All concerning data has been retrieved by the popular search engine Google. Said institutions are ranked with Web Impact Factor (WIF) and Web Indicators for Science, Technology and Innovation Research (WISER) value. The result shows that National Institute for Locomotor Disabilities (NILD) is highest ranked WIF (inlink) i.e., 0.48, due to its webpages' minimal value (766) depending on the quantity of the available inlinks (364). National Institute for Empowerment of Persons with Multiple Disabilities (NIEPMD) (8.65) being the highest webpages (3430) occupied the top ranked institution according to WISER. Alexa rank is also used to show the usability of websites and Wayback machine tool is used to retrieve domain registration data and page domain authority data retrieved from Free Domain SEO Analysis Tool – Moz.

**Keywords :** Divyangjan Institutes; Web Analysis; Webometric; Website Study; WIF; WISER

### INTRODUCTION

In the current time, nobody can go even a solitary advance without the utilization of the web, hence the Internet has now become one of the essential well springs of dispersal of data for scholastic and examination exercises, subsequently, it is an extraordinary stage for testing new strategies for assessing webometrics. Webometrics or Internetometrics is a scientific survey of website-related issues. The internetometrics or webometrics study is beneficial to the internet, utilizing data provided by viable search engines.

“Measurable studies of the internet are named as webometrics” by Almind and Ingwersen<sup>[1]</sup>. “Even though, the underlying problem had already been addressed at the same time by Larson, He is a pioneer in fundamental exploratory related structural investigations with his first pure informetrics assessment of the web.”<sup>[2]</sup> Webometrics ranking “is the system of rating websites based on composite indicators of visibility and activity measures”.<sup>[3]</sup> Webometric research is “concerned with Web page content, Web link structure, Web usage and Web technology analysis”.<sup>[4]</sup> Webometric is “the study of the quantitative aspects of the construction and use of information resources, structures and technologies on the web, drawing on bibliometrics and informetric approaches.”<sup>[5]</sup>

Any educational institute’s websites are the most popular communication tool within countries and around the world. The most vital element in the success of a Divyangjan Institute is its website and how it’s perceived on the internet. As such, it is crucial to evaluate the online presence of these institutes, in addition to their academic performance.<sup>[6]</sup> As per the World Health Organization, 2011 report approximately 15% world's people spend their lives with some form of disability and predictable that some factors will increase the number of people with disabilities in the future. Because of social inequalities, they belong to more vulnerable parts of society, who’s experience higher rates of poverty and unemployment.<sup>[7]</sup> According to India's 2011 Census, the number of disabled people in India is 2.68 crore or 2.21% of the population. The survey of the National Sample Survey Organization estimates that 69% of disabled Indians live in rural areas, 49% are literate, and 34% are

employed.<sup>[8]</sup> Consequently, despite the fact that a sizable portion of the population is comprised of people with specially able, the issues that this population faces tend to be overlooked by both academia and the general. Because of their physical limitations, this community is not able to actively participate in many activities; thus, they are dependent on the Internet. In this work, we examined the web impact factor analysis, link-pattern analysis, domain and page authority, referring domains and backlinks analysis, and Alexa web traffic rank analysis of the National level Divyangjan Institutes website of India.

### STATEMENT OF THE PROBLEM

Websites of National level Divyangjan Institutes are the most important web communication tools. The reality that these institutions have been involved in activities and have grown in significance, necessity, and size in the present day and soon can be quantitatively and qualitatively demonstrated through a study of their websites using the webometric techniques of WISER and WIF. One of the parameters Calculating a website's impact factor (WIF) by counting the number of web pages, the total number of links, self-link pages, in-link pages, or external link pages, and correlating this to the WISER Index Value is a method for analyzing websites.

The finding of this study seems useful for the persons engaged in collective learning and the community of persons with disabilities, encouraging research and collaboration, can help people in the same field share concerns and knowledge. This study can be a valuable resource for researchers interested in the welfare and rehabilitation of disabled persons.

Improvement of the new technology innovations, web development, and special elements of the web climate, like hypertext and hyperlink, have prompted major unrest in the information science region which, thus, puts an accentuation on the need of concentrating on different parts of the web to improve and more utilization of the present significant peculiarity. This has been regularly affirmed by analysts.<sup>[9]</sup>

Nonetheless, the quality or notoriety of National Divyangjan Institutes can't be definitively estimated by simple numbers. It would be difficult to have an exhaustive subjective and not quantitative positioning of National Divyangjan Institutes, because of the colossal contrasts in National Divyangjan Institutes and the specialized troubles in getting equivalent information across the globe. Then again, there is no positioning of National Divyangjan Institutes utilizing various models of webometric study. This study attempts to fill this gap in the literature.

## REVIEW OF LITERATURE

Webometrics was developed by analyzing the raw data collected by search engines to determine the link structures within academic web spaces. "Larson was one of the first information scientists to perform an investigation of link structures in academic web spaces in his paper 'Bibliometrics of the World Wide Web: an exploratory analysis of the intellectual structure of Cyberspace'."<sup>[2]</sup> Madhusudhan and Prakash, 2013 inspect the linking analysis of sixteen IIT sites where they show the web page number is the main component for impacting the WIF also as the WISER index value of any organization.<sup>[10]</sup> Patelet *al.*, 2021 "analyzed the websites of the top

fifteen universities ranked in NIRF and found that they had low visibility and reported a poor EWIF (External Web Impact Factor). The researchers recommended that university authorities prepare a long-term plan to promote and create a sound web policy so that the universities' web presence could improve globally."<sup>[11]</sup>

Ratha, Naidu, and Silawat, explored the construction of the SAARC nations national library websites.<sup>[12]</sup> An examination of the websites of the UK Departments of Information Science was reported by Arakaki and Willett.<sup>[13]</sup> A webometric analysis of the websites of 45 Tamil Nadu universities (27 states and 18 private) was conducted by R. Jeysankar and B. Ramesh Babu in 2009.<sup>[14]</sup> In his work, in 2015 Elgohary evaluated the WIF of Arab universities.<sup>[15]</sup> Walia and Kaur, 2008 presented the findings of a webometrics investigation conducted on the websites of selected Indian library associations.<sup>[16]</sup> Sarkar and Pal, 2018 calculate the three types of WIFs of the Indian banking websites.<sup>[18]</sup> Bharna and Verma investigated the library websites of top ranked Indian law institute ranked by NIRF-2018; they also "explored a webometric analysis of South Asia's National Libraries websites and it was noticed that the National Library of India has highest domain and page authority. The national library of Sri Lanka was found to have the highest internal equity passing link, and the most influential website for the region is the National Library of India."<sup>[18,19]</sup>

Bidhan Dolai, in 2018 "calculate the web impact factors of thirteen govt. aided university in Kolkata and show very low association among the WISER rank and inlink rank."<sup>[20]</sup> Jhamb and Ruhela, in 2017 "examine the websites of public libraries directed by the Ministry of Culture,

Government of India. they concentrated on Domain and Page Authority, Link Analysis, and Web Impact Factor of Public libraries sites, and found that The Central Secretariat library is having the most WIF”.<sup>[21]</sup>

Parthasarathi Mukhopadhyay measured the “WIF different levels of domain name system based on the analysis of hyperlinks i.e. for ccTLDs of SAARC group of countries; sub-level domains related to education & research and registered under Indian ccTLD and hosts under IIT and IIM educational system in India and reported some problems about the webometrics study”.<sup>[22]</sup> Through the AltaVista search engine, Alireza Noruzi looks into the "Web Impact Factors (WIFs) for Iranian colleges.”.<sup>[9]</sup>

### **OBJECTIVES OF THE STUDY**

The primary objective of the study is to examine the webometrics and web impact factors of the websites of Indian National Institutes in the field of disability. The other inter-linked objectives are :

- i) To understand, identify and examine the Indian National level Divyangjan Institutes websites and their links;
- ii) To link-Pattern Analysis of the National level Institutes’ websites in the field of disability;
- iii) To examine the significance of WIF in relation to Top Level Domain.;
- iv) To quantify the WIF (self-link) and WIF (in-link or external link) and simple WIF (Web Impact Factor);
- v) To investigate the domain and page authority, and domain registration date, and

to compare different ranking methods among websites;

- vi) To analyze the Alexa traffic rank (global and Indian) of the selected websites;
- vii) To calculate the spearman co-relation between the ranking of WIF (inlink) with WISER. and
- viii) To semblance the National level Divyangjan Institutes' websites according to their WIF and WISER index scores.

### **SCOPE OF THE STUDY**

The study's scope is limited to a webometric analysis of nine National Divyangjan Institutes in India, with the goal of establishing a ranking of National level Divyangjan Institutes' websites using webometric analysis by evaluating their WISER and WIF (inlink). The ranking will prove helpful in comparing and identifying the websites of National level Divyangjan Institutes based on their WISER, WIF (inlink), and Alexa traffic rank.

### **METHODOLOGY**

The validity of any study is determined by a systematic approach to data collection and logical and sequential data analysis. In the present study, websites of the Indian government Divyangjan Institutes are considered. During the month of April 2022, all the required data was acquired from the Google search engine, in accordance with the objectives. For each of the National Divyangjan Institutes, the following search queries are used to obtain data:

**Table 1: Search Command and Retrieved Result in Google Search Engine**

Sr. No.	Search command*	Results
1	site:~abc	Total no of Web pages
2	site:~abc NOT	Total No of inlink or (external links)/ R-WIF
3	site:~abc AND	Total No of selflink
4	linkdomain:~abc	Total No of links
5	site:~abcfiletype:pdf	Report total no of pdf file
6	site:~abcfiletype:doc	Report total no of doc file
7	site:~abcfiletype:ppt	Report total no of ppt file
8	site:~abcfiletype:xls	Report total no of xls file
9	site: ~abc (search in Google Scholar)	Total no of pages in google scholar

\*Note: ~ denote Space among command

### Tools

Domain registration data retrieved from the Wayback machine tool and page domain authority data retrieved from Free Domain SEO Analysis Tool – Moz. Retrieved data is analyzed, visualized and tabulated with the help of MS-Excel and MS-Word. Besides this, lots of literature is found about the webometric study from which can get ideas about this study.

### Techniques

Link evaluation as one of the webometric techniques is used for this study along with WISER index, Alexa rank and WIF.

### Web Impact Factors (WIF)

The online version of the impact factor is known as WIF. WIFs are classified as WIF (simple), WIF (selflink) and WIF (inlink). We used the WIF (simple) in this study which introduced by Ingwersen in the year 1998, i.e. The number of

backlinks to a site divided by the number of webpages on the same site is expressed as follows:

A = Total number of web pages to a site

B = Number of external backlinks to a given site

C = Number of selflinks to a given site

D = Total number of links to a site

Therefore, WIF (simple) =  $D/A$ ; WIF (inlink) =  $B/A$  and WIF (selflink) =  $C/A$

### WISER (Web Indicators for Science, Technology and Innovation Research)

To calculate the WISER index value the following formula, proposed by Webometrics Research Group, has been used:

WISER value =  $\log(\text{Visibility } 50\%) + \log(\text{Size } 20\%) + \log(\text{Rich files } 15\%) + \log(\text{Scholars } 15\%)$ .

**Table 2 : WISER Ranking by the Webometrics Research Group**

WISER Rank	
Visibility 50% (inlinks or external links)	Size 20% (WebPages)
	Rich Files 15% ((Adobe Acrobat (.pdf), MS Word (.doc, .docx), MS Power point (.ppt, .pptx) and MS excel (.exl))
	Scholars 15% (Google Scholar database)

(<http://www.webometrics.info/en/Methodology>)

### Alexa Rank

Alexa rank is a rank of websites, based on the accessibility, traffic, bounce rate, pages per visit, average visit duration etc., offered by Amazon.

### Spearman’s Rank Correlation (R)

Spearman’s Rank Correlation (R) phenomenon has been in this study to measure the strength of the relationship between WISER and WIF rank. The formula used to measure the rank correlation is:

$$R = 1 - \frac{6\sum d^2}{(n^3 - n)}$$

Where d = difference between the two ranks, n = number of pairs of data (total observation)

## DATA ANALYSIS AND INTERPRETATION

Retrieved data are analysed and interpreted according to the objectives;

### Domain Analysis

Top Level Domains (TLDs) of nine National Divyangjan institutions, Second Level Domains (SLDs) related to Indian Government Entities or Government Departments domain under the TLD for India (.in) and the Universal Resource Locators (URLs) of nine National Divyangjan Institution have been collected by conducting Google search engine and presented in table three and four

**Table 3: Domain Extensions of Divyangjan institutions Websites**

Sr. No.	Domain Extensions	No. of institutions	Percentage (%)
1	.nic.in	6	66.67
2	.gov.in	1	11.11
3	.ac.in	1	11.11
4	.in	1	11.11

Table 3 shows that each one national Divyangjan Institutes have their own website, among them six websites working under Domain Name System

(DNS) “.nic.in”, rest are for one in each “.gov.in”, “.ac.in” and only “.in”.

**Table 4: List of Institution and their details of URL, domain registration date and authority**

Sl. No.	Name of the Institute	State	Est. Year	Website URL	Domain Registration Date	Page authority	Domain authority
1	National Institute for the Empowerment of Persons with Visual Disabilities (NIEPVD)	Dehradun (uttarakhand)	1967	www.nivh.gov.in	<a href="#">10/12/2012</a>	36	34
2	Ali Yavar Jung National Institute of Speech and Hearing Disabilities (AYJNISHD)	Mumbai (Maharashtra)	1983	www.ayjnihh.nic.in	<a href="#">27/05/2005</a>	39	34
3	National Institute for the Empowerment of Persons with Intellectual Disabilities (NIEPID)	Secunderabad (Telangana)	1984	www.niepid.nic.in	<a href="#">14/05/2017</a>	41	32
4	National Institute for Empowerment of Persons with Multiple Disabilities (NIEPMD)	Chennai (Tamilnadu)	2005	www.niepmd.tn.nic.in	<a href="#">02/07/ 2007</a>	51	62
5	Pt. Deendayal Upadhyaya National Institute for Persons with Physical Disabilities (PDUNIPPD)	Vishnu Digambar Marg (New Delhi)	1975	www.iphnewdelhi.in	<a href="#">06/07/2005</a>	32	29
6	Swami Vivekanand National Institute of the Rehabilitation Training and Research (SVNIRTAR)	Cuttack (Odisha)	1984	www.svnirtar.nic.in	<a href="#">24/12/2014</a>	41	35
7	National Institute for Locomotor Disabilities (NILD)	Kolkata (West Bengal)	1978	www.niohkol.nic.in	<a href="#">25/06/2013</a>	41	36
8	Indian Sign Language Research & Training Centre (ISLRTC)	Okhla Phase-II (New Delhi)	2011	www.islrtc.nic.in	<a href="#">27/02/2018</a>	27	25
9	National Institute of Mental Health and Rehabilitation (NIMHR)	Sehore (M.P)	1973	www.nimhr.ac.in	<a href="#">05/12/2020</a>	20	20

Table 4 reflects the information of the nine National Divyangjan Institutes of India with their abbreviation, location, establishment year, website URL, domain registration date, page authority and domain authority. It is noted that out of nine Institute NIEPVD is the oldest of all, being established in 1967 and among them ISLRTC is the youngest, founded in 2011. It has also been observed that

AYJNISHD has an agedest domain registered on May 27, 2005. The domain registration date envisage by the “Wayback Machine” (digital archive of the World Wide Web founded by the Internet Archive, lunched 2001). It indicated that the NIEPMD website has the highest page authority & domain authority (51 & 62) and NIMHR website has the lowest page authority & domain authority (20 & 20).

### Calculation of WIFs

**Table 5: Calculation of WIFs for National Divyangjan Institutes based on WIF (Inlink)**

WSLD	webpages (A)	inlinks (B)	selflinks (C)	Total links (D)	WIF(simple) (D/A)	WIF(inlink)(Rank) (B/A)	WIF (selflink) (C/A)
nivh.gov.in	577	8	108	2	0.003	0.01 (9)	0.19
ayjnihh.nic.in	502	199	599	8	0.016	0.40 (4)	1.19
niepid.nic.in	1,890	810	1,590	8	0.004	0.43 (2)	0.84
niepmd.tn.nic.in	<b>3,430</b>	1,150	2,470	8	0.002	0.34 (5)	0.72
iphnewdelhi.in	1,190	334	697	8	0.007	0.28 (6)	0.59
svnirtar.nic.in	2,390	355	1,960	8	0.003	0.15 (7)	0.82
niohkol.nic.in	766	364	860	8	0.010	<b>0.48 (1)</b>	1.12
islrtc.nic.in	1,190	509	1,170	8	0.007	0.43 (3)	0.98
nimhr.ac.in	170	10	94	8	0.047	0.06 (8)	0.55

Table 5 indicates that National Institute for Locomotor Disabilities (NILD) is having most WIF (inlink) i.e., 0.48, due to its little value of webpages (766) with respect to value of inlinks (364) available. NILD is followed by NIEPID (0.43) and ISLRTC (0.43). National Institute for the Empowerment of Persons with Visual

Disabilities (NIEPVD) is having lowest value of WIF (inlink) i.e., 0.014, because of very largest value of webpages (577) with respect to available inlinks (8).NIEPMD has the highest webpages (3430), followed by SVNIRTAR and NIEPID with 2390 and 1890 webpages respectively.

**Calculation of WISER**

**Table 6: Ranking of the national institutes under DEPWD based on the WISER indicator**

Institutes	Web pages (A)[S]	Inlinks (B)[V]	Rich Files [R]					Google Scholar (F) [SC]	WISER Index Value	WISER Rank
			Doc	Pdf	exl	ppt	total			
NIEPVD	577	8	0	9	0	0	9	7	2.82	8
AYJNISHD	502	199	0	234	0	0	234	37	6.29	5
NIEPID	1,890	810	1	1,100	1	0	1102	35	8.12	2
<b>NIEPMD</b>	<b>3,430</b>	<b>1,150</b>	<b>1</b>	<b>1,790</b>	<b>1</b>	<b>0</b>	<b>1792</b>	28	<b>8.65</b>	<b>1</b>
PDUNIPPD	1,190	334	0	379	0	0	379	4	6.13	6
SVNIRTAR	2,390	355	0	939	0	0	939	5	6.95	3
NILD	766	364	0	701	1	0	702	1	5.64	7
ISLRTC	1,190	509	0	411	0	0	411	14	6.89	4
NIMHR	170	10	0	19	0	0	19	2	2.16	9

Table 6 shows the quantity of web-pages, perceivability, rich file, Google researcher worth and doling out proper weighted, we have determined the record esteem, and in view of the list esteem webometric rank has been appointed to these institutions. The above calculation is done in light of webometric information and utilizing WISER equation which is explained in the methodology section. It is revealed from table 6 that NIEPMD (WISER value 8.65) being the highest webpages (3430) occupied the most ranked institution followed by NIEPID (WISER

value 8.12) and SVNIRTAR (WISER value 6.95). NIMHR is ranked ninth with 2.16 WISER value. AYJNISHD has the highest number of Google Scholar. In each parameters of WISER formula, NIEPMD has the highest number of observations except number of Google Scholar.

**Correlation (R) Calculation**

Spearman’s Rank Correlation process is used to calculate the correlation among the two ranks, i.e., WISER and WIF.

**Table 7: Correlation between WISER and WIF**

Institutes	WISER (x)	WIF (y)	d = x-y	d <sup>2</sup>
NIEPVD	8	9	-1	1
AYJNISHD	5	4	1	1
NIEPID	2	2	0	0
NIEPMD	1	5	-4	16

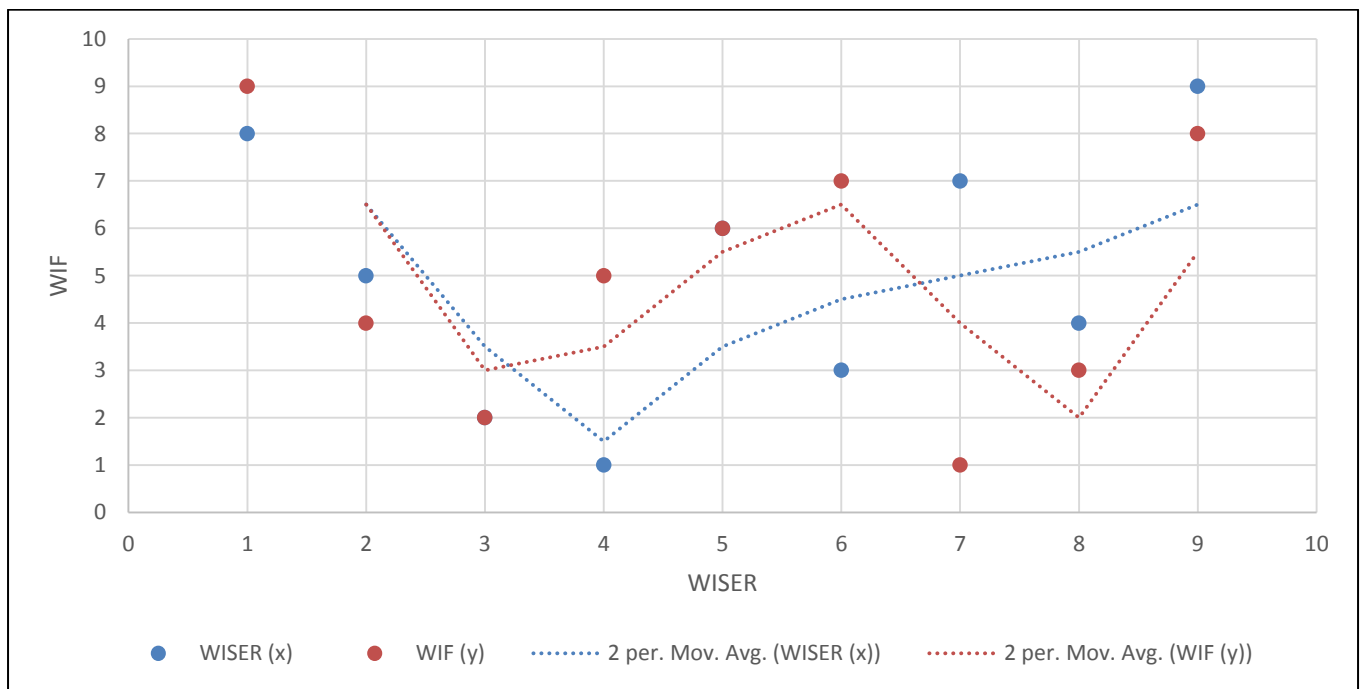
PDUNIPPD	6	6	0	0
SVNIRTAR	3	7	-4	16
NILD	7	1	6	36
ISLRTC	4	3	1	1
NIMHR	9	8	1	1
Total				$\sum d^2 = 72$

$$R = \frac{6\sum d^2}{(n^3-n)}$$

$$= 1 - ((6*72) / (9^3-9)) = 0.4$$

The calculated value of rank correlation is 0.4 where n = 9 and  $\sum d^2 = 72$ . The rank correlation

shows relationship among two variables (ranks). Correlation will always between -1.0 and +1.0. The calculated value indicates that there a positive correlation is existing between WISER and WIF. If we plot these said ranks in a scatter diagram than these may occur as following.



**Figure 1: Scatter diagram of WISER and WIF**

The calculation already proves that there is a positive correlation between the said ranking

methods. The trend lines in the above diagram are also vividly shown it graphically.

**Alexa Rank Details**

**Table 8 : Alexa Rank details of concerning institutes**

Institutes	Alexa Rank (Global)	Alexa Rank (India)	Daily pageviews per visitor	Daily time on site	Bounce rate (%)	Total sites linking in
NIEPVD	5,56,257	1,50,070	1.5	54 s	68.8	51
AYJNISHD	12,22,413	0	1.0	32 s	0	54
NIEPID	5,47,193	1,29,508	1.9	2 m 16 s	61.8	40
<b>NIEPMD</b>	<b>19,340</b>	<b>1,879</b>	<b>2.5</b>	<b>3m 19 s</b>	<b>28</b>	<b>991</b>
PDUNIPPD	8,30,624	82,267	2.0	1m 28	25	28
SVNIRTAR	4,32,654	54,013	1.3	1m 29s	74.5	44
NILD	4,99,835	0	1.8	2m 3s	69.7	34
ISLRTC	66,88,730	0	1.0	0	0	10
NIMHR	28,61,710	0	2.0	0	0	4

Table 8 shows, the Alexa webtraffic ranks (global and Indian) with daily pageviews per visitor, daily time on site, bounce rate and total sites linking in. According to Alexa NIEPMD ranked first globally (19340) and nationally (1879) among the nine institutions. NIEPMD is followed by SVNIRTAR (global - 432654; national - 54013). From the viewpoint of minimal bounce rate PDUNIPPD stood first with 25%. Both by WISER and Alexa, NIEPMD ranked first, which also shows the closeness of these ranking methods. ISLRTC stood in ninth position among the said institutions.

### CONCLUSION

Disabled people are as much important for society as others. In the present era, National Institutions under the Department of Empowerment of Persons with Disabilities (Divyangjan) are the life line and their websites are the sole source of information for academic activities in the disabled community. This study

provides webometric information about the said institutions and following conclusions are made from the above analysis and discussions; Maximum number of websites (6 out of 9) are maintained by NIC; NIEPVD is the oldest among others but it is ranked in almost last by both WISER (8) and WIF (9) ranking methods; location distribution of the institutions is not uniform in nature; NIMHR has only 170 webpages, followed by AYJNISHD (502) and NIEPVD (577), these need a tremendous improvement; According to WISER and WIF, NIMHR is also ranked last and second last respectively; positive correlation between the WISER and WIF value is find out in this study area; By the Alexa ranking method ISLRTC stood in the last position but surprisingly NIEPMD is ranked first by Alexa and WISER; bounce rate of SVNIRTAR (74.5%) need to minimize. According to the findings websites of the concerning institutions need to be improved to make it more useful by the users.

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