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# RESEARCH ENRICHMENT OF THE FACULTY MEMBERS IN ALAGAPPA UNIVERSITY, INDIA: THE METRICS BASED ON WoS (WEB OF SCIENCE) AND SCOPUS

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## ABSTRACT

The proposed study aims to analyze that Citations and h-Index variations analyzed based on records of Web of Science (WoS) and Google Scholar Metrics (GSM). The citations and h-Index for research credential of the faculty members in Alagappa University based on both WoS and GSM during 1989-2018. It is found from the analysis the highest output of 262(10.90%) of the publications. in the year 2018, whereas citations found to be 298 for h-Index only 7 acquired by the whole faculty members of Alagappa University for the year 2018. It is analyzed maximum 290 (12.20%) of the publications contributed by the researchers from Central Electro chemical Research Institute was highly collaborated with Alagappa Universities , which has top Citations and h-Index 3852 and 32 respectively. The propounded according to Google Scholar Metrics (GSM) SK Pandian was to be a top ranked researcher, despites his year wise citations shows 4491 and h-Index credited 36 during 2008-2018.

**Keywords:** Web of Science (WoS), Google Scholar Metrics (GSM), Citations, h-Index, Faculty members, Researchers and Collaboration

## 1. INTRODUCTION

Robert K Merton described the 'ethos of science', captured in the acronym CUDOS for 'communism', 'universalism', 'disinterestedness' and 'organized scepticism', a complex of norms and values directing how research should be conducted<sup>1</sup>. Few might argue against the principles expressed in this ethos, although many scholars from the 1950s and onwards would claim them unattainable , due to problems of setting one complex of regulating norms for sets of activities that are widely varying in terms of intellectual and social organization. And while Merton, together with Thomas Kuhn, are 'founding fathers' of the study of the social aspects of science , both have contributed to solidifying a strong normative view on the organization of scientific enterprises : Merton through the formulation of the ethos and Kuhn by distinguishing between mature and immature fields of research<sup>2</sup>.This tendency towards implementing a strong norm for how research should

be organized and conducted has been going on throughout the 20<sup>th</sup> century, and is largely based on an idealized model of the hard sciences characterized e.g. by the cumulative nature and a focus on the use of quantitative methods.

Google Scholar's size has a long tradition and is considered by some as the "golden fleece." <sup>3</sup> examined, even just two years after Google Scholar's launch in late 2004, <sup>4</sup> took up the challenge to be the first to assess its coverage. The study concluded that Google Scholar's coverage of Thomson Scientific Journal lists, Directory of Open Access Journals, and Journals from the SOLIS database was 78.5%. Later-on Aguillo<sup>5</sup> found that Google Scholar might list a total of more than 86 million records. Two years later, Khabisa and Giles<sup>6</sup> studied that close to 100 million records were listed. Utilizing query hit count concluded that its size must extend beyond all previous estimates and concluded that Google Scholar is likely to contain 176 million documents, including articles, citations, and patents. Nevertheless, due to the opacity of Google Scholars' technical functionality "all methods [of assessing its coverage] show great inconsistencies, limitations and uncertainties" In the face of these challenges, the question remains whether Google itself is only unwilling to report its size, or perhaps is in fact is incapable of doing so. This work intends to shed more light onto how large Google Scholar actually is and how it compares to other large multidisciplinary ASEBDs

Modern Scientometrics are based on de Solla Price D<sup>7</sup> and Garfield E <sup>8</sup>. Despite growing interest and research output in this field, the scientific data that has been published to date on ETS has not been dissected in detail by means of Scientometrics. By contrast, the existing Scientometric studies have had a more general focus <sup>9</sup>. Karin Vitzthum et.al <sup>10</sup> A combinations of Scientometric methods and novel visualizing procedures were used, including density-equalizing mapping and radar charting techniques. 6,580 ETS-related studies published between 1900 and 2008 were identified in the ISI database. Using different Scientometric approaches, a continuous increase of both quantitative and qualitative parameters was found. Jeyasekar and Saravanan<sup>11</sup> carried out a bibliometric study of the Journal of Forensic Sciences and found that there is an increase in publications on digital and multimedia aspects of forensic science and the literature related to application of DNA technology in forensic science is also increasing. The mean degree of authorship collaboration is 0.91.

## **1.1 LITERATURE REVIEW**

Data used to establish the coverage provided over time by the different databases. The dominant databases used in R&D statistics are Science Citation Index/Science Citation Index Expanded (SCI/SCIE) (SCIE is the online version of SCI), Social Science Citation Index (SSC) and Arts and Humanities Citation Index (AHCI). Together with other databases these

databases are included in the Web of Science (WoS) provided by Thomson Reuters, USA (Thomson Reuters,<sup>12</sup> Of special interest is Conference Proceedings Citation Index (CPCI) (Thomson Reuters,<sup>13</sup> partially overlapping with SCI/SCIE (Bar-Ilan, 2009). It is necessary to specify the databases included in a search on WoS. In our work special attention has been paid to the coverage of SCI and SSCI.

Two primary sources of citation data on Web of Science (WoS) and Scopus, which collect and validate data from a subset of journals, and Google Scholar, which searches the web looking for citations to specific papers and books. The strengths and weaknesses of the two sources have been well documented.<sup>14</sup> Delgado-Lopez-Cozar and Cabezas-Clavijo<sup>15</sup> have observed. Broadly speaking, WoS and Scopus produce high-quality and comprehensive data for the journals that they cover, but they do not generally include books and their coverage is incomplete, especially in the social sciences (around 50%) and arts and humanities (around 30%). GS has a very good coverage (up to 90%) and is roughly the same for all disciplines. On the other hand, its data can be unreliable; often generating multiple versions of the same paper, and it sometimes includes non-research outputs such as teaching notes and home pages. The user interface to GS is simplistic and it offers few facilities, for example field lists of journals, but because of its coverage it is an important source of data for the social sciences and arts and humanities. It is also the case that there is little documentation available and, in fact, this paper utilizes a search facility that is little known because it is undocumented.

Relative growth rate (RGR) was found to be fluctuating trend during the study period. The doubling time (DT) was found to be increased and decreased trend in this study. Degree of collaboration and its' mean value is found to be 0.963. The top three institutions with Alagappa University are Central Electro Chemical Research Institute, National Cheng King University, and Anna University<sup>16</sup>.

Baskaran<sup>17</sup>, examined that confront the publications output trend among USA Scientists; Wang Y has secured top level as measured 0.226%. USA scientists have contributed totally 15832 (30.815%) items and include 87.947% percent are appeared as journal articles. Harvard University scientists are much attention in produced large number of research papers and they hold top level among research collaboration in enzyme research. Sivakami and Baskaran<sup>18</sup> examined the Swine Flu is that, unlike seasonal flu, which is typically most dangerous to the very young, elderly and those with a weakened immune system. By keeping this in mind the researcher intends to study the research productivity of Swine Flu.

Baskaran<sup>19</sup>, analyzed that the total no. 419 bibliographical records were retrieved from DJLIT website during the period of study. The result of the study observed that Maximum of 70 papers was brought out in the year 2012. It followed by 66 papers published in 2013. The study found that DJLIT productivity range of publications between 12.17 and 16.76 over the period of study. RGR and Dt was an increasing and a decreasing

trend observed over period of study. It is found that highest RGR was 0.18 in 2012 and lowest RGR was 0.04 known in two years 2014 and 2016 it could be observed RGR and Dt went on exponential growth were does not progress during the period. 36.75 % of the publications shared single author. Saravanan and Baskaran<sup>20</sup> have observed the study tries to map the number of publications, growth rate and doubling time, scattering of publication over journals, and its impact on publication output, authorship patterns and Global citation score of bioremediation research publication in India using the HistCite, VOS viewer software. Indian Institute of technology, Baba atomic research centre and CSIR are the major producers of research output in the area of bioremediation. The doubling time (DT) was found to be increased and decreased trend in this study. Degree of collaboration and its' mean value is found to be 0.963. The top three institutions with Alagappa University are Central Electro Chemical Research Institute, National Cheng King University, and Anna University .

Teixeira da Silva and Dobránszki <sup>21</sup> found that there exists a “true” value of the h-index that can be reached if the dataset were completely independent of the objectives of the database. In our opinion, such a “true” value does not exist; the h-value is database- dependent. Several bibliometric studies have pointed to (large) differences between the databases, which are mainly driven by different coverages of the literature leading to different citation counts for one and the same paper. The WoS, for example, does not claim to cover the complete set of publications, but a core selection. With a reference to Bradford’s Law, Garfield <sup>22</sup> argued in favour of a core selection of journals representing the entire journal set. At the other extreme, GS collects information using web-spiders, including non-scholarly literature, pre-publications, and various versions of the same publication without clear selection criteria of quality. Scopus follows the WoS model, but includes more journals than WoS. RG is primarily a repository of preprints; the collection allows for the definition of a database- specific h-value. Given these different objectives, the expectation is not that the h-index values are similar or even convergent across databases. Baskaran and Rameshbabu <sup>23</sup> analysed that DC between 0.64 and 0.94 and overall DC measured to be 23.08 throughout study period. The study could be found DC was an increased and a decreased trend appeared in the whole study period. Value n in the field of Forensic Medicine is being analyzed, it has calculated the exponential growth is  $n = 4.4320914$  for author.

### **3. OBJECTIVES OF THE STUDY**

1. To observed an increasing trend between Citations and h-Index of the publications accordingly with Web of Science(WoS) and Google Scholar Metrics (GSM) in Alagappa University.
2. To observe the centrally funded institutions have more collaboration with Alagappa University,

3. To examine the Citation and h-Index, whether it is there any relation to no. of publications,
4. To analyse the WoS and GSM have any equal Citations and h-Index during the period of study,
5. To identify the different blocks with h-Index for those accumulated citations for the publications during period of study.

### **3.1 Salient feature of GSM and WoS**

#### **Web of Science (WoS)**

1. ISI citation databases were essentially the only practical sources for locating these references and citations.
2. Web of Science should not be used alone for locating citations to an author or title.
3. Expanding the coverage of Web of Science, in November 2009
4. Thomson Reuters introduced Century of Social Sciences. This service contains files which trace social science research back to the beginning of the 20th century.

#### **Google Scholar Metrics (GSM) :**

1. GSM is to locate citations not covered by ISI. Significantly, this study showed that
2. GSM can help identify a considerable number of citations in document types not covered by ISI citation databases;
3. This may assist in providing a more comprehensive picture of the extent of international and interdisciplinary nature of scholarly communication of and among researchers;
4. GSM has several technical problems that users should be aware of in order to accurately and effectively locate citations; selection of the database(s) for locating citation is field-dependent.

## **4. METHODOLOGY**

The study has been designed for Citations h-Index of the Publications accomplished by the faculty members in Alagappa Univeristy, India. The data have been retrieved from Web of Science (WoS) and Google Scholar Metrics (GSM) for the purpose of the study. The Publications accountability on year-wise growth analysis was taken from Web of Science

(WoS) during 1989-2018. On the study also determined the Citations and h-Index measured both WOS and GSM as year-wise analysis only taken during 2008-2018. The research based on intellectual and social organization of science and research, and on the other on studies Citation and h-Index being mapped for an intellectual structure of different fields of research achieved by the faculty members in Alagappa University. Further, the study could be examined the collaborative Institutions of Alagappa University, of those citations and h-Index being ranked for the study. The research identifies relationships between cited and citing articles by the Individual authors being ranked according to the quantum of Citations and h-Index based on WOS and GSM during the period of study. The comparative study on Citations and h-Index made between WoS and GSM for proposed study.

ISI Web of Science (WoS) provided research analysis and Citation for a particular subject and period. It was used search term" Alagappa University", the retrieved a total number of 2376 records and total no. of 30582 Citations accounted during 1989-2018. The study obviously discussed about citations counts h-Index too for the researchers and collaborative institutions of Alagappa University. Further, the research was made for Citations and h-Index analysis from WOS and GSM for a researcher and those items have been taken up in the year-wise as above specified period.

## 5. ANALYSIS

### 5.1. Year-wise distribution and Citations of the Alagappa University

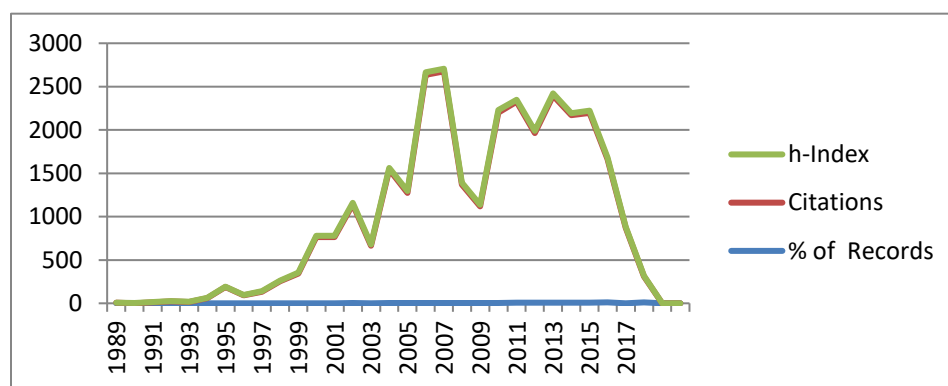
The study analyzed that year wise productivity of the faculty members, citations and h-Index recorded during 1989 -2018. The data retrieved on Web of Science also it is observed that publications trend slowly increased during period of study. Maximum of 262 (10.90%) of the publications have been brought out by the faculty members in 2018, whereas citations received 298 and h-Index only 7 scored.

It is found from table 1, the highest Citations 2672 and h-Index 30 for the publications only 93 (3.83) % of the publications brought out by the faculty members of Alagappa University in 2007. The result of the study could find that Citations and h-index are not relate to number of publications, it depends only prime and Quality of research in every domain (Fig.1). Further

**Table 1. Year-wise distribution and Citations of the Alagappa University**

Year	No. of Records	% of the records	No. of Citations	h-Index
1989	1	0.04	6	1
1990	1	0.04	1	1
1991	2	0.08	12	2
1992	3	0.12	21	3
1993	5	0.20	15	3
1994	10	0.41	57	4

1995	11	0.45	187	6
1996	19	0.79	91	6
1997	19	0.79	132	7
1998	20	0.83	254	9
1999	33	1.37	342	10
2000	35	1.45	761	17
2001	41	1.70	762	17
2002	48	1.99	1139	19
2003	39	1.62	663	15
2004	58	2.41	1540	21
2005	58	2.41	1270	23
2006	88	3.66	2634	29
2007	93	3.87	2672	30
2008	62	2.58	1367	22
2009	62	2.58	1117	18
2010	99	4.12	2197	28
2011	151	6.28	2318	25
2012	151	6.28	1958	24
2013	171	7.11	2388	27
2014	176	7.32	2165	22
2015	204	8.49	2189	25
2016	238	9.90	1656	18
2017	242	1.07	870	11
2018	262	10.90	298	7



**Fig. 1- Year-wise distribution and Citations of the Alagappa University**

## **5.2. Research Collaboration of the publications, Citations and h-Index of Alagappa University**



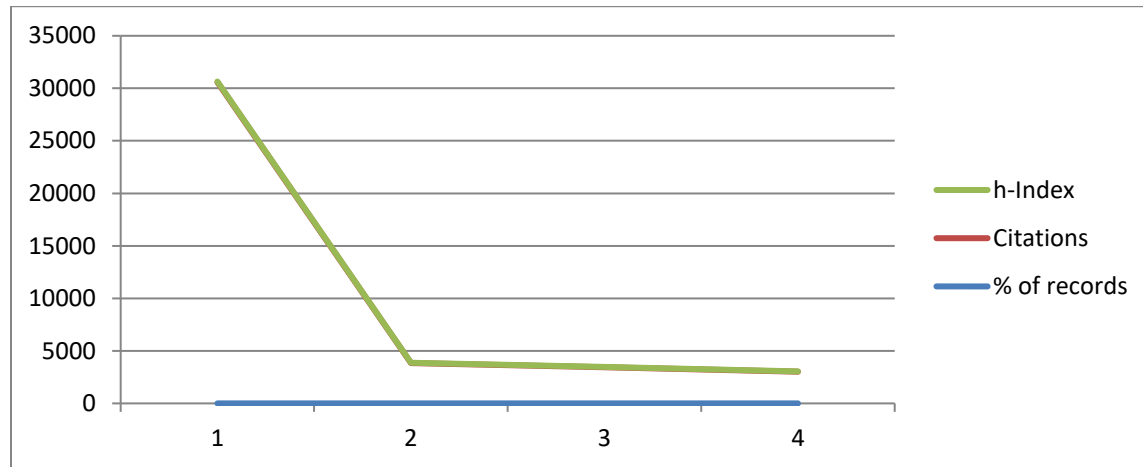
It has been analyzed research collaboration between the institutions productivity and citations also presented h-Index of the in an individual contribution the concerned research for 2376 publications, Table 1 observed that total citations 30582 received for overall h-index 63. It is examined that there are listed the top twenty four Institutions were collaborated with Alagappa University, of those maximum 290 (12.20%) of the publications contributed by the researchers from Central Electro chemical Research Institute being considered as a top ranked institute and to be witnessed noteworthy in terms of Citations 3852 and h-index score was 32.

Further, there was analyzed that residue twenty three institutions were collaborated with Alagappa University sum of 2086 (87.8%) of the publications, which considerably, less than 10% witnessed from fig. 2. On the study witnessed that top three Citations and h-Index recorded by Council of Scientific and Industrial Research, Central Electro Chemical Research Institute and Central Electronics Engineering Research Institute India, these Institutions have been centrally funded by Government of India, also theses centrally funded institutions normally promoted the wealthy research among the stockholders of the institutions.

**Table 2. Research Collaboration of the publications, Citations and h-Index of Alagappa University**

S.No	Name of the Institutions	No. of records	% of the records	No. of Citations	h-Index
1	ALAGAPPA UNIVERSITY	2376	100	30582	63
2	COUNCIL OF SCIENTIFIC INDUSTRIAL RESEARCH CSIR INDIA	290	12.20	3852	32
3	CENTRAL ELECTROCHEMICAL RESEARCH INSTITUTE INDIA	222	9.34	3443	31
4	CENTRAL ELECTRONICS ENGINEERING RESEARCH INSTITUTE INDIA	187	7.87	3019	28
5	ANNA UNIVERSITY	100	4.20	1226	19
6	MADURAI KAMARAJ UNIVERSITY	77	3.24	685	13
7	BHARATHIDASAN UNIVERSITY	70	2.94	520	12
8	UNIVERSITY OF MADRAS	64	2.69	789	16
9	NATIONAL CHENG KUNG UNIVERSITY	55	2.31	1369	23
10	KYUNGPOOK NATIONAL UNIVERSITY	54	2.27	1952	22
11	ANNAMALAI UNIVERSITY	53	2.23	364	10
12	KING SAUD UNIVERSITY	49	2.06	310	10
13	AJOU UNIVERSITY	44	1.85	809	17
14	UNIVERSITY OF PISA	39	1.64	331	11
15	BHARATHIAR UNIVERSITY	34	1.43	67	5

16	SHIZUOKA UNIVERSITY	32	1.34	389	13
17	ALAGAPPA CHETTIAR COLL ENGN TECHNOL	31	1.30	266	9
18	INDIAN INSTITUTE OF TECHNOLOGY SYSTEM IIT SYSTEM	30	1.26	263	11
19	PERIYAR UNIVERSITY	30	1.26	574	13
20	SREE SEVUGAN ANNAMALAI COLLEGE	28	1.17	327	11
21	THIRUVALLUVAR UNIV	28	1.17	334	12
22	NATIONAL TAIWAN OCEAN UNIVERSITY	27	1.13	538	12
23	SASTRA UNIVERSITY	26	1.09	361	11
24	DONGGUK UNIVERSITY	25	1.05	254	9
25	KARUNYA INSTITUTE OF TECHNOLOGY SCIENCES	25	1.05	168	7



**Fig. 2 - Research Collaboration of the publications, Citations and h-Index of Alagappa University**

### 5.3. Year -wise analysis of Citations and h-Index on Web of Science (WoS)

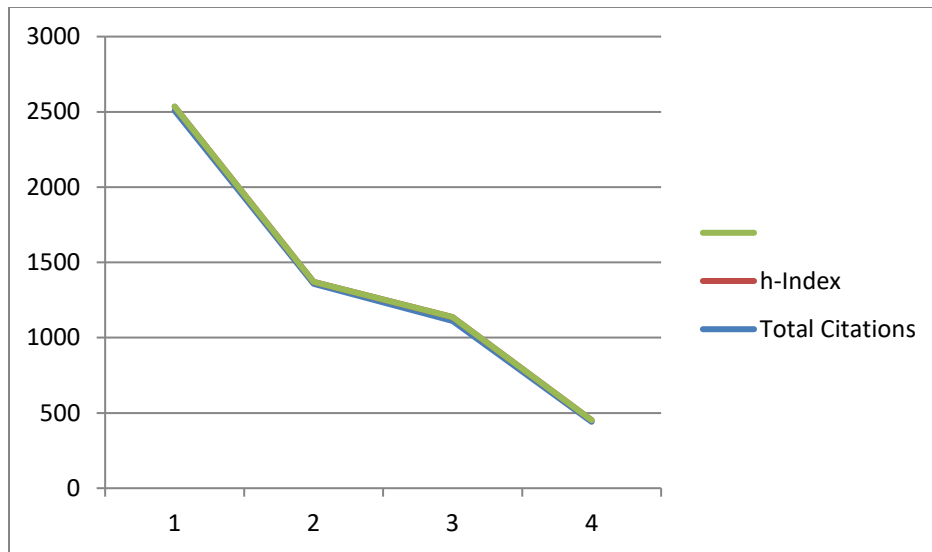
Table 3 is reported that ranked researchers credential of the Citations and h-Index given as per Web of Science citations report during 2008-2018. The study explicit SK Pandian considered to be top ranked researcher among twenty five listed researchers for the study, the range of Citations credential for his publications between 6 and 487 for total citations 2508 whose h-Index was 27.

It is analyzed that on account of highest citations 79 recorded by Sankaranarayanan. K , B.Vaseeharan (64) and (84) in the year 2008, 2009 and 2010. The study can be witnessed that rest of Years between 2011 and 2018, SK Pandian credentials on Citations

were highest 157,240,260,345, 431, 415 and 487. Further, the study is reflected that range of h-Index 6 and 25 for twenty four researchers have been reported from the study.

**Table 3. Year -wise analysis of Citations and h-Index on Web of Science (WoS)**

S.No	Name of the research	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	No Cit
1	SK Pandian	6	16	47	85	157	240	260	345	431	415	487	25
2	Ravi G	1	7	7	9	22	49	46	80	98	111	120	13
3	Vassharan B	47	64	82	71	94	101	132	121	210	331	572	11
4	Singh SK	0	0	0	3	9	75	75	76	90	83	92	44
5	Balamurugan K	0	0	0	1	6	17	18	33	74	82	105	33
6	Kalaigan GP	28	43	47	77	101	129	182	160	159	148	131	12
7	Sekar C	0	0	0	3	15	34	62	120	186	227	246	90
8	Jeyakanthan J	0	0	7	12	13	22	22	28	28	39	63	21
9	Sundararajan M	0	0	0	2	6	28	57	78	111	128	179	59
10	Thanmpidurai S	0	2	1	3	9	17	21	29	39	101	88	37
11	Stalin T	0	0	0	1	3	11	27	53	53	85	118	35
12	Ramesh M	3	2	3	9	10	26	25	32	46	40	74	27
13	Ravikumar S	1	2	1	16	22	44	53	54	63	63	67	39
14	Sivakumar R	22	36	39	32	31	26	36	67	94	105	132	39
15	Sankaranarayanan K	79	49	53	82	52	54	56	76	74	69	53	85
16	Yuvakumar R	0	0	0	0	0	0	2	15	19	14	62	11
17	Dharuman V	0	0	1	6	10	25	64	62	62	54	68	35
18	Sivakumar M	18	35	52	41	41	75	50	53	74	86	80	63
19	subadevi R	18	6	17	18	35	41	41	50	70	82	76	62
20	Karuppachamy S	0	0	0	0	0	0	7	16	74	85	69	26
21	Prabhu NM	0	0	0	0	2	12	19	17	49	48	117	26
22	Sengottuvelan N	0	0	0	0	0	1	4	21	35	40	45	14
23	Wilson J	13	14	14	13	19	39	52	83	104	98	105	56
24	Viswanathan S	25	35	32	39	29	27	33	45	59	61	65	49
25	Kannapiran E	0	0	3	2	2	6	3	4	11	22	35	92



**Fig. 3- Year -wise analysis of Citations and h-Index on Web of Science (WoS)**

#### **5.4. Year -wise analysis of Citations and h-Index on Google scholar**

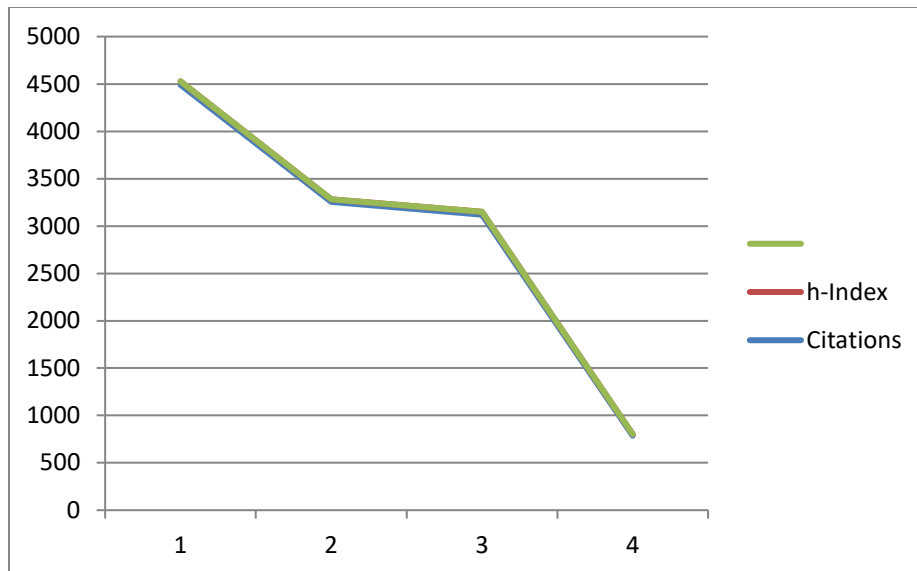
It is witnessed from table 4 twenty five researchers listed the citations according to Google Scholar Metrics (GSM) for the study. It is found that SK Pandian was to be a top ranked researcher, despite his year wise citations shows 4491 and h-Index credited 36 during 2008-2018. The study could be dealt for Ravi G has achieved more than 100 citations between 2014 and 2018 for his total Citations 3253 and who acquired h-Index was 26. Vaseeharan, B only witnessed above 100 citations found to be in the year 2009 and 2010. Kalaigan GP, Vaseeharan B and SK Pandian, Sankaranarayanan K Ravikumar S and Viswanathan, K could be witnessed more productive publications, on account of those have been brought out more than 100 citations in the year 2011, 2012 and 201. Further, More than 200 Citations witnessed that SK Pandian, Vassharan B and Kalaigan GP were received the Citations for them publications in the year 2014, SK Pandian and Vaseeharan B in the year 2015.

Above three hundred citations were reported for credibility of those publications contributed by SK Pandian (715) Ravi G (322) and Vaseeharan B(374) in the Year 2016. The study discussed that SK Pandian (705), Ravi G (434) and Vaseeharan B (637) in the year 2017. Further, the study could be evidenced on the Citations for the binging out good impact of the publication contributed from highly impact journal, Despite the researcher sustain for them citations recorded above 500 by SK Pandian (829), Ravi G (569) and Vaseeharan B (829) in the Year 2018. Further, the researchers SK Pandian (36), Ravi

G(26) , Vaseeharan B (31) , Kalaignan GP (26) , Sekar C (22), Sundararajan M (20), Ravikumar S (30) and Viswanathan S (24) who have scored h- Index more than 20, , rest of the 17 researchers were accomplished h-index more than 10 witnessed from the study.

**Table 4. Year -wise analysis of Citations and h-Index on Google scholar**

S.No	Name of the researcher	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	No. Cita
1	SK Pandian	14	44	75	157	277	450	533	587	715	705	829	449
2	Ravi G	65	70	67	79	84	96	132	171	322	434	569	325
3	Vaseeharan B	74	108	126	115	166	197	228	230	374	637	829	312
4	Singh SK	24	8	6	11	9	30	118	110	122	142	192	787
5	Balamurugan K	21	22	36	51	55	87	59	80	121	145	164	985
6	Kalaignan GP	47	67	73	121	140	203	240	227	225	188	186	193
7	Sekar C	24	11	49	35	60	81	119	185	240	291	348	159
8	Jeyakanthan J	27	39	58	84	89	82	91	92	81	103	150	102
9	Sundararajan M	5	7	13	13	26	56	105	174	206	210	337	117
10	Thanmpidurai S	0	7	3	12	9	21	49	59	76	146	166	564
11	Stalin T	33	42	62	56	55	60	74	82	85	106	168	887
12	Ramesh M	4	8	6	26	28	48	60	74	99	90	132	580
13	Ravikumar S	9	24	42	165	361	282	281	314	296	255	224	236
14	Sivakumar R	36	47	53	68	58	60	90	135	143	157	203	111
15	Sankaranarayanan K	90	49	70	112	71	87	80	105	89	80	57	108
16	Yuvakumar R	0	0	0	3	7	23	77	151	191	254	394	112
17	Dharuman V	33	27	35	35	38	48	89	91	77	87	108	750
18	Sivakumar M	22	42	59	45	59	77	71	83	103	111	111	835
19	subadevi R	0	0	0	0	0	0	0	0	0	0	0	0
20	Karuppachamy S	0	0	0	0	0	0	0	0	0	0	0	0
21	Prabhu NM	3	3	0	5	5	29	35	42	98	103	195	546
22	Sengottuvelan N	21	25	20	22	25	39	43	54	61	65	88	528
23	Wilson J	19	15	18	18	24	39	67	102	125	116	142	711
24	Viswanathan S	63	96	99	142	139	195	145	204	209	198	180	178
25	Kannapiran E	3	0	5	4	10	33	34	41	38	89	99	375



**Fig. 4- Year -wise analysis of Citations and h-Index on Google scholar**

### 5.5 Comparison of Citations and h-Index on Web of Science and Google Scholar

The data presented in table 4, comparative analysis made between Web of Science (WoS) and Google Scholar Metrics (GSM) for the researchers in Alagappa University. There are twenty five researchers listed for the study, of those SK Pandian was scored highest citations 2508 and its h-Index 27 according to WOS, on the other hand, citations and h-Index were 4491 and 36 respectively identified from GSM. It is concluded that both GSM citations more than 1983 higher than GSM Citations for being calculated in this study. Surprisingly, Kalaigan GP was received 501 GSM citations higher than WOS, nobody else scored like his Citations out of twenty five researchers. Similarly, h- Index was 21 for GSM and 15 for WOS.

It is witnessed that range of WOS citations for 25 researchers between 92 and 2508, whereas GSM citations measured between 375 and 4491, therefore overall the study confined GSM citations 55: 84 higher than WOS citations. Further, there has been reported that h-index listed for 25 researchers those range between 5 and 27 for WOS, on the other side, 11 and 35 for GSM.

**Table 5. Comparison of Citations and h-Index on Web of Science and Google Scholar**

S.No	Name of the researcher	Web of Science (WoS)		Google Scholar	
		No. of Citations	h-Index	No. of Citations	h-Index
1	SK Pandian	2508	27	4491	36
2	Ravi G	1358	12	3256	26
3	Vassharan B	1112	25	3120	31
4	Kalaignan GP	1288	21	787	15
5	Singh SK	441	11	985	18
6	Balamurugan K	338	11	1935	26
7	Sekar C	903	17	1592	22
8	Sankaranarayanan K	850	16	1027	15
9	Sivakumar R	393	14	1172	20
10	Jeyakanthan J	210	8	564	14
11	Sundararajan M	599	16	887	17
12	Thanmpidurai S	376	11	580	15
13	Stalin T	353	12	2368	30
14	Ramesh M	271	12	1112	18
15	Ravikumar S	393	12	1085	18
16	Yuvakumar R	116	5	1128	19
17	Dharuman V	356	11	750	16
18	Sivakumar M	639	10	835	11
19	subadevi R	624	9	0	0
20	Karuppachamy S	261	9	0	0
21	Prabhu NM	268	10	546	13
22	Sengottuvelan N	149	7	528	14
23	Wilson J	562	11	711	11
24	Viswanathan S	497	14	1780	24
25	Kannapiran E	92	6	375	11

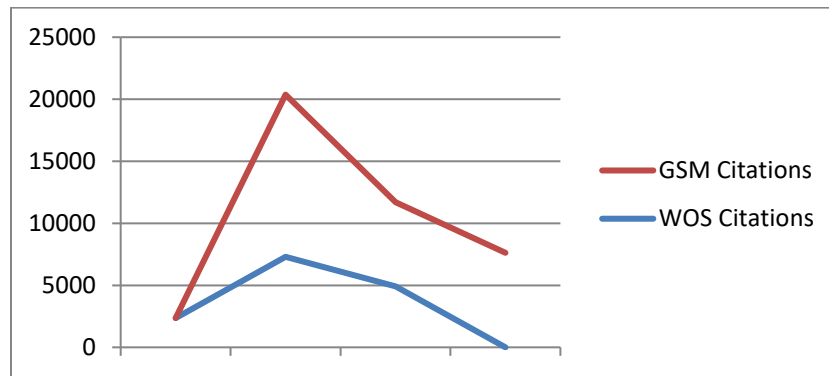
**5.6 Blocks on h-Index and Citations of WOS and GSM for 25 researchers**

There are divided into four blocks for being grouped h-Index ranges between 5 and 10, 11 and 20, 21 and 30 also 31 and 40 against Citations accumulated by an individual Researcher match between WOS and GSM. It is analyzed form table 6, the first block holds

h-Index between 5 and 10 covered 2359 for WOS, whereas GSM no citation grouped in first block. The Second block h-Index between 11 and 20 which covered 7297 for WOS and 13072 for GSM, the block was to be predominantly occupying the major portion of citations for both WOS and GSM. It followed by, the third block covered h-Index 21 and 30, the block with 4908 and 6783 Citations for WOS and GSM which is considered to be second large block. Further, the fourth block has h-Index between 31 and 40 only GSM covered the Citations 7611, WOS with no citation in this block exhibited in Fig. 5.

**Table 6. Blocks on h-Index and Citations of WOS and GSM for 25 researchers**

Blocks	Range of h-Index	Citations of WOS	Citations of GSM
1	5-10	2359	-
2	11-20	7297	13072
3	21-30	4908	6783
4	31-40	-	7611



**Fig. 5- Blocks on h-Index and Citations of WoS and GSM for 25 researchers**

## 6. MAJOR FINDINGS

1. The result of the study could be discussed about the researchers of Alagappa university those received Citations and h-Index based on WoS and GSM during 2008-2018.
2. The large no. of output of 262(10.90%) of the publications. in the year 2018, whereas citations found to be 298 for h-Index only 7 acquired by the whole faculty members of Alagappa University for the year 2018.
3. The highest Citations 2672 and h-Index 30 for the output only 93 (3.83) % of the publications brought out by the faculty members of Alagappa University in the Year



2007. Maximum 290 (12.20%) of the publications contributed by Central Electro chemical Research Institute was collaborated with Alagappa Universities which was considered top ranked among the listed institutions.

4. SK Pandian considered to be a top ranked researcher among twenty five listed researchers for the study, the range of Citations credential for his publications between 6 and 487 for total citations 2508 whose h-Index was 27.
5. SK Pandian was to be a top ranked researcher, despite his citations shows 4491 and h-Index credited 36 during 2008-2018. Range of WOS citations for 25 researchers between 92 and 2508, whereas GSM citations measured between 375 and 4491, therefore overall the study confined GSM citations 55: 84 higher than WOS citations.
6. First block holds h-Index between 5 and 10 covered 2359 for WOS, whereas GSM no citation grouped in first block. The Second block h-Index between 11 and 20 which covered 7297 for WOS and 13072 for GSM, the block was to be predominantly occupying the major portion of citations for both WOS and GSM.
7. The study reflected that not even single year has equal of Citations also h-Index found WoS and GSM over period of study.

## **7. SUMMERY AND CONCLUSION**

Thus study explores that publications grows the proportion of citations and h-index will be increased, as above discussed where open access journals are significant role to apply for them study from Google site, there no mandatory login ID. Google is significantly use by the Researchers only free, whereas Web of Science (WoS) promote based on subscription through consortium or institution viable. Web of Science record more rely and double blind peer reviewed journal only incorporated in the Database. Whereas Google scholar may not be covered non peer-reviewed journals, therefore researchers easy to find the relevant material use citations for those areas. The conclusion of nearly all of these studies is that Google Scholar provides broader coverage for most disciplines and that the Web of Science and Scopus provide fairly similar results. There are no studies, however, that provide large-scale and comprehensive cross-disciplinary comparisons between all three databases. Moreover, only two studies were published in the last 3 years and two-thirds of the studies were conducted at least 5 years ago. Given that coverage for both Google Scholar and Scopus has increased over the last couple of years, it would seem opportune to conduct an up-to-date study. Only two studies have taken an explicitly longitudinal approach to database comparisons. De Winter et al. (2014) compared the growth of citations to 56 classic research articles between Google Scholar and the Web of Science. On average, Google Scholar citations increased by 87.2 % between 2005 and 2013 and Web of Science citations by 63.9 %, i.e. a growth of approximately 1 % per month for Google Scholar and 0.7 % for the Web of Science. However, Google Scholar also showed a significant retroactive expansion of approximately 2.5 % per month, whereas Web of Science retroactive growth was negligible. Harzing (2014) indicated a longitudinal study of the

2011–2013 growth of Google Scholar citation metrics for 20 Nobel Prize winners in Medicine, Chemistry, Physics, and Economics, hence covering a select group of academics in the Life Sciences, Sciences, and Social Sciences. She concluded that after an earlier period of significant retroactive expansion for Chemistry and Physics from Google Scholar citations were increasing at a fairly stable rate of 1.5 % per month between 2012 and 2013.

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