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IMPACTS OF SOCIAL MEDIA USE ON ACADEMIC ACHIEVEMENT: A BIBLIOMETRIC ANALYSIS (2001-2023)

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Abstract: The present bibliometric study was conducted to elucidate a comprehensive overview of existing body of academic literature on how social media affects student's academic achievement. By a thorough synthesis and analysis of the Scopus database covering scientific publications of last twenty-three years the key trends, patterns, and gaps in the existing literature were identified by the investigators. The analysis in this field is confined in 1284 publications extracted from the Scopus database covering the period since the year 2001 and 2023. The analysis is based on the keys of research methods, influential authors, and the evaluation on this field of study. The findings of the study confers that the interest of exploration in this field has been increasing gradually with a remarkable increase in the last decade. The key findings from the literature review indicate the harmful effects of social media use on information processing and attention span thereby, revealing the lower academic achievement. In this study the out sketch and information of previous research on social media use and its harmful impact on academic achievement will be beneficial for the future researchers, academicians and policy-makers to addressing this important issue in the digital society.

KEYWORDS: Academic Achievement, Citation, Cluster, Digital Platform, Document, Scopus, Social Media, VOS viewer,

I. INTRODUCTION

In the present digital era social media has occupied a significant position in human's everyday life. Social media refers to the involvement of theoretical elements such as social presence, media richness, self-presentation, and self-disclosure **(Kalpan & Haenlein, 2010)[8].**

The social media platform has considerably metamorphosed the means of communications of the individuals within the world around them. For sudden appearance of Covid-19 pandemic students are being accustomed with the use of social media to obtain education distantly which imparted both positive and negative outcomes **(Oliveria et al., 2022).[14]**

Social media platforms such as Face book, Instagram, Snapchat, Whats App etc. have become the inseparable parts of students' lives providing them with the platform for social interaction, information exchange, and self-expression. But, teacher and parents are worried about the negative outcome of superfluous use of social media on children's physical condition, personal information protection, and on-campus education interference **(Lu, 2021)[12].** Students' ability to concentrate on their studies is being diminishing which potentially may affect the academic achievement of the students.

On the contrary, social media can serve as a valuable tool of learning, providing students the access to the online educational resources and collaborating with peers on their academic topics.

Adolescents receive the mechanism to get involved in the society for enhancing learning skills in particular area. **(Ahn, 2011)[1].** According to **Yunus et al. (2012)[19]** the participation on social media improves the students' writing skill as well as vocabulary and reading skill. Media websites has a significant positive impact on overall academic performance of Indian higher education students (**Sobaihet al.2022)[15].**

The influence of social media on academic journey of the students has gained the attention of the researchers for being explored extensively over the past decades.

II. OBJECTIVES OF THE STUDY

- To examine the output and growth of research in the field of impact of social media on academic achievement in the world during the period of 2001 to 2023.
- To identify the pioneering research countries across the world and India's role in social media research during the period of the study.
- To compare the mode of researches in the field of social media across different parts of the world made during the period of the study.
- To identify the details of co-authorship, leading authors and keywords in this field.

III. RIVIEW OF LITERATURE

Sukjairungwattana, &Xu (2023)[18] carried out a bibliometric study which was quantitative and qualitative in nature on social media as the platform for knowledge management. VOS viewer (N=1841) and CitNetExplorer (1780 publications) were adopted to conduct the study. The qualitative study revealed that though social media gained popularity in education due to proximal development, many issues such as teacher resistance, data privacy, costs, and ethical and social issues were under the question marks.

Luong et al. (2023)[11]collected 2,122 bibliographic records (2005 to 2021) from Web of Science database to examine the researches done on the use of social media on kindergarten to 12th grade education worldwide. For this purpose the authors considered the main features of social media in general education community, the primary sources in the field, the leading research themes and the new research topics on social media in education. The research showed that the leading countries were the US, England, Australia, China, and Turkey in respect of the highest number of publications. Two prominent topics were found to be most considerable which were COVID-19-related, online and distance learning. Their outcomes provided the primary knowledge on the social media in general education which was considered as a source of reference for teachers, school managers, and policymakers interested in that field.

Fauzi, Mohamad& Abdul (2023)[4]made a bibliometric study which included bibliographic coupling and co-word analysis to review the trend of application of social media for knowledge sharing (KS) in higher education. The result showed that academic topics were the use of social media for expertise sharing and knowledge sharing's impact on university-industry networking. On the contrary, topics related to students were under the impacts of social media and academic performance.

Hossainet. al. (2022)[6]investigated the growth and country collaboration on social media (SM) research during the COVID-19 pandemic through VOS viewer by citation and network analyses. They found that USA was the pioneer in publications in this field. Chen IH and Lin CY were found to be most productive authors. The study also found the International Journal of Environmental Research and Public Health were remarkable for publishing the most of the articles on social media in higher education considered for their research.

The authors suggested that from their study academic researchers, organizations, and policymakers would be beneficial for understanding the continuous research on social media during the last pandemic.

Sun, Wang & Feng (2021)[17]carried out a bibliometric investigation of articles belonging to the area of linguistic studies on social media with the help of Web of Science Core Collection databases and VOS viewer in order to identify the general characteristics, major strands of linguistics, main research methods, and important research themes in the field.

The author found sociolinguistics and pragmatics to be the major formulas of linguistics used in relevant studies. They also revealed that important research themes were extracted and classified based on the dimensions of the genre framework of social media studies.

Ling, Yaacob & Latif (2021)[9]examined the global research growth on social media by analyzing related publications in the Scopus database in order to study on the influence of social media during the COVID-19 pandemic. The authors found that USA and UK were the leading countries on the study of social media and Covid-19.Twiter as a social media platform was frequently used most for imparting pandemic information. The author showed that the keywords "older adults" and "health policy" were potential areas of concern that future research could fruitfully explore.

Fernández et al. (2021)[3] investigated bibliometrically to reveal the position of the efficiency of scientific studies in social media and its influencers with the help of Scopus databases and VOS viewer.

They found that in 2020 the scientific studies on social media gained high pace where the United States was the strong influencer. The interesting interlinks among technical, scientific, and social subjects were also viewed. The study also provided co-occurrences by keywords as well as co- authorships by nationalities. The co-occurrence was

related with an increase in human and Instagram aspects, and co- authorships indicated a strong Anglo-Saxon area of influence.

Noor et. al. (2020)[13]conducted a bibliometric study with the help of Vos Viewer for examining the publications on social media in connection to knowledge management (K.M.) in the most influential journals, institutions, and countries. The authors processed 234 SM KM publications collected from Web of Science (WoS) since 2009-2019. The Journal of Knowledge Management was viewed to be the most influential journal with regard to social media publications in knowledge management. In the case of countries USA and England ranked first and second respectively. Tampere University of Technology was found to be the best institute in the productivity of publications of study on social media in connection in knowledge management.

Hasim, Rasid &Atalla (2018)[5]designed a bibliometric analysis on the role of social media on teaching and learning within higher education institution. The study showed that the number of publications related to this topic was in decreased mode from the year 2012 to 2016. However, in 2017 the interest in this topic started to increase. The study also revealed that most of the researchers were coming from USA, United Kingdom, Malaysia, Australia, Canada, Italy, South Africa, Egypt, Ireland and Jordan. In total researchers from 25 countries across the world focused on this type of studies. Researchers coming from both developed and developing countries showed interest in social media studies.

Su et. al. (2020))[16]conducted a bibliometric analysis to identify the current state of the academic literature regarding social network analysis (SNA). The authors applied Lotka's and Bradford's law to perform author productivity analyses in this field during 1999 and 2018, respectively. They found that social network analysis had been very popular with high maturity. It was seen that SNA related to many research areas such as Computer-mediated communication," "Online learning," "Social Network" and 'Community of inquiry'.

Lopes et. al. (2017)[10]undertook a bibliometric analysis of the scientific articles on the use of the social network in educational research.

The study revealed Computers and Education to be the most relevant journal by number of publications and impact factor, which constructed the growth of scientific production on the use of the social network in educational research from 2008 onwards.

The study also indicated that the authors of many countries such as Australia, Taiwan, United States, South Africa and United Kingdom adopted Face Book for knowledge construction in educational research. It was also found that interdisciplinary and transversal nature in different areas of research existed that means the co-existence of other field of knowledge with the ego-network of the Educational Research area.

IV. MATERIALS AND METHODS

To address the issue of the impact of social media use for receiving education, both the quantitative and qualitative studies using VOS viewer were conducted. The bibliometric analysis using VOS viewer (N=178) to identify the top cited authors, documents, organizations, sources, countries, and keywords with high occurrences was done.

The complete record of each article from the Scopus database was downloaded in CSV format. Generally, bibliometric analysis can be conducted mainly through three steps: (1) Data Collection and Screening, (2) Data Analysis and (3) Reporting the results.

1.1. Data Collection and Screening Strategy

For this study Scopus database was selected to retrieve the data. Scopus is online standardized data base that contain current data sets for the study of the research and analysis. This data sets weighed remarkable bibliographic database of peer-reviewed scientific publications on different research areas. This study is conducted mainly through bibliometric analysis on their impact of social media on academic achievement. The strategy of the study was set as follows:

1) TITLE-ABS-KEY: social and media AND academic achievement.
2) The limited search period: 2001 to 2023.
3) The subject areas: Social science, Psychology, Arts and Humanity, EVS, Neuroscience and multidisciplinary.
4) The selected document types: articles
5) The No. of key words were selected: 36
6) The type of language selected: English.
7) All open access articles were set for the study.

Unrelated literatures were eliminated, data explore append documents like journal and article. Irrelevant literature like book chapters and erratum, conference proceedings were excluded. Initially, 1284 documents were found while using title and abstract, and year from 2001 to 2023 in continuation of bibliometric analysis.

However, all data were collected on a given day (10thFebrury, 2024) to avoid expectation bias from significant fluctuations in the database. Fig.1 adorns the flow chart of the study identification and selection. The records of each article, including title, publication outputs, research categories, countries/institutions, authors/co-cited authors, journals/co-cited journals, and keywords were downloaded from the Scopus database in the csv.

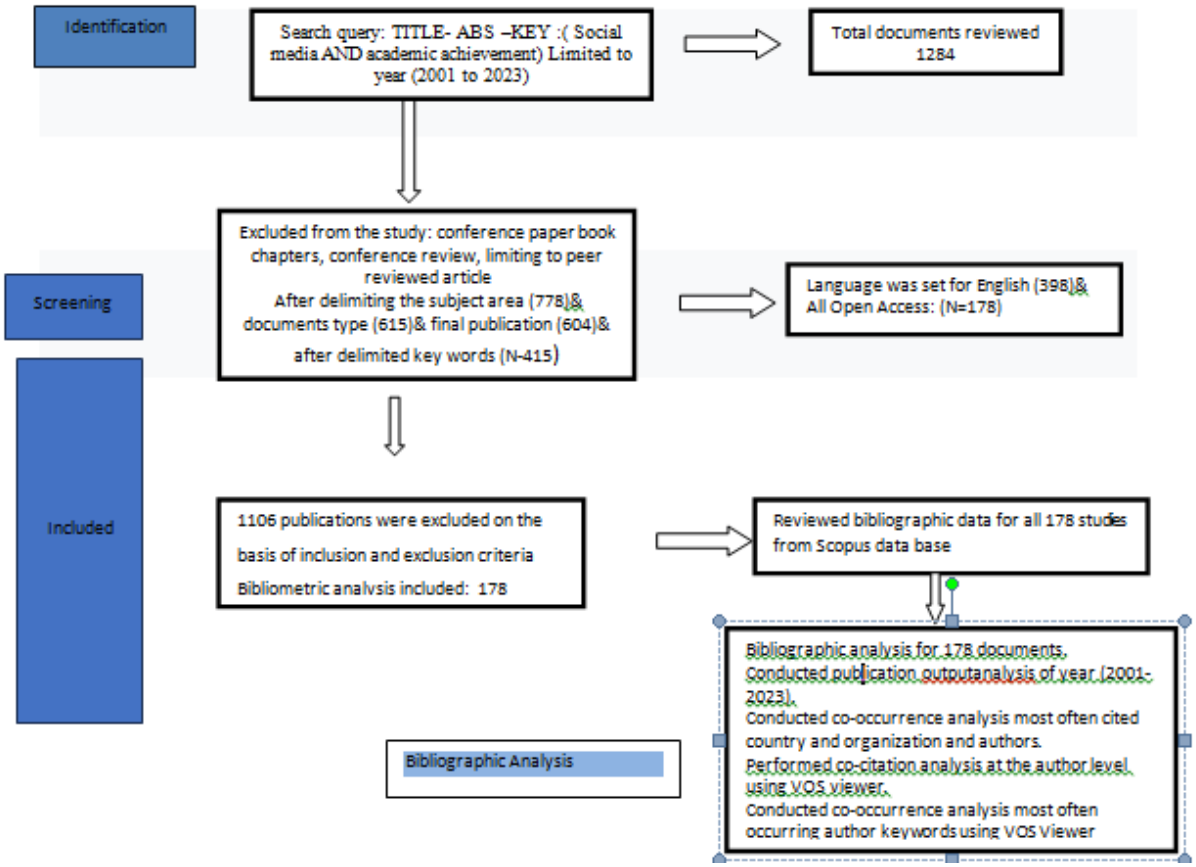

Fig. 3: The Flow Chart Showing the Study Identification and Selection

1.2. Data Analysis

The bibliographic data such as citation Information, bibliographic information, abstracts and keywords and reference are exported and saved for subsequent data analysis which includes descriptive statistics as well as advanced bibliographic analysis including citation, co-citation and visualization of similarities using author co-citation keyword co-occurrence. The Scopus Analytical tools, Excel and VOS Viewer bibliometric software were used to conduct the bibliometric analysis.

1.2.1.Software Tools

Different free software tools like VOS Viewer, MS Excell etc. were taken into consideration while discussing thebibliometricanalysis.VOS Viewer is the most essential tool for constricting and visualizing bibliometric networks. In this study, the VOS Viewer was used for keyword analysis, citation analysis, co-citation analysis, and bibliographic coupling with cluster overlay analysis, where the frequency is shown by node size. In This bibliometric analysis, VOS viewer tools help to show the connection between the node size of the network, which represents the number of study frequencies. This network analysis represents the collaborative relationships for network analysis. VOS viewers have different parameters like maximum to minimum full counting method of (countries /author/institution) individual documents. Cluster view also shows author citations per year with the help of VOS Viewer. It makes clear associative relations in this field. Scopus analytical tools, Excel and the bibliometric software of VOS Viewer were used to complete the bibliometric analysis.

1.3. Reporting the Results

This study includes 178 papers. Document types were delimited by only articles. Only final stage publications were taken from the Scopus data. Fig. 2 displays the publication trend from 2001 to 2023; gradually, the numbers of publication output hastened in 2012, and the number of publications uninterruptedly increased from 2022 to 2023. In 2021 publications displayed as overall rampant rising trend with 133 articles. This output identifies

many scholars who highlighted this topic. Naturally, the study in this field rapidly increased in 2023, with an output of 144. The publication rate per year is depicted in table 1. The predictive curve shows that the publication trend became higher in the year of 2013, but it rapidly increased from the year 2017.

Table-1: Showing the Publication No. per Year

YEAR	PUBLICATIONS	YEAR	PUBLICATIONS
2001	06	2013	67
2002	10	2014	55
2003	13	2015	43
2004	15	2016	52
2005	27	2017	51
2006	34	2018	63
2007	31	2019	88
2008	38	2020	106
2009	47	2021	133
2010	40	2022	118
2011	42	2023	144
2012	61		

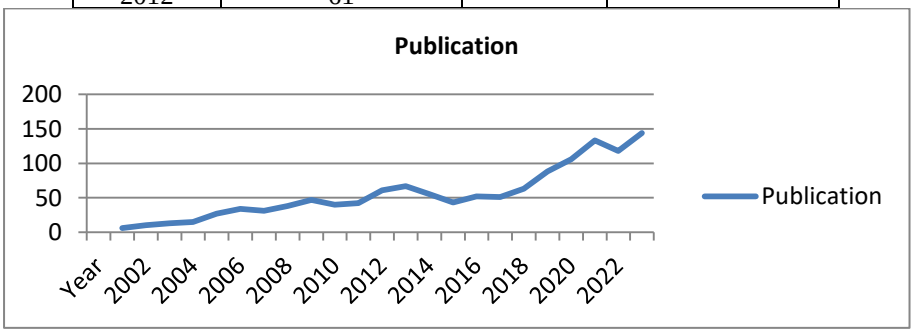

Fig.2: Showing the trend of Publicationsduring2001 -2023
Source: Scopus Database

1.3.1. Analysis of Top Countries/Regions

Seventy-nine countries play the important role in publishing papers on the role of social media usage on academic achievement. The top 11countries ranked by bibliographic coupling (Table 2). For each of the 11 countries, the total strength of the bibliographic coupling links with other countries has been calculated. The United States takes the top position among the ranked countries based on the document count and citation. United Kingdom occupies the second place and Turkey the third based on the citation. Other important countries are China, Spain, and Australia with remarkable publications on this research topic. The fig. 3 represents the shares of total papers publications on the focused topic for each of the ranked countries.

Table-2: Showing the Country-wise Documents with Citation and Total Link Strength

Country	Documents	Citation	Total Link Strength
United Kingdom	26	1054	881
United States	58	2382	450
Canada	8	198	415
China	10	177	341
Spain	9	131	291
Turkey	11	240	288
Germany	8	215	185
Netherland	5	234	138
Malaysia	8	161	265
Poland	5	224	175
Australia	9	263	9

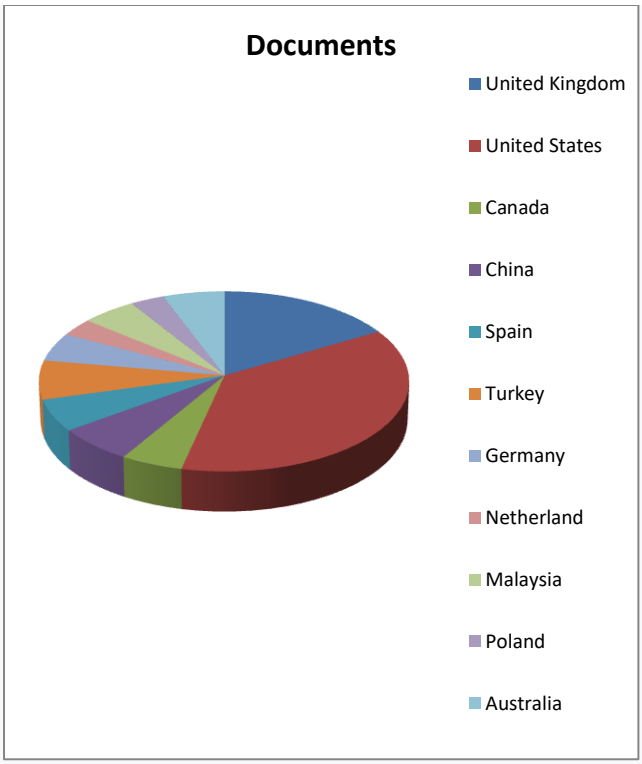

Fig. 3: Showing Country-wise Shares in Document Publications

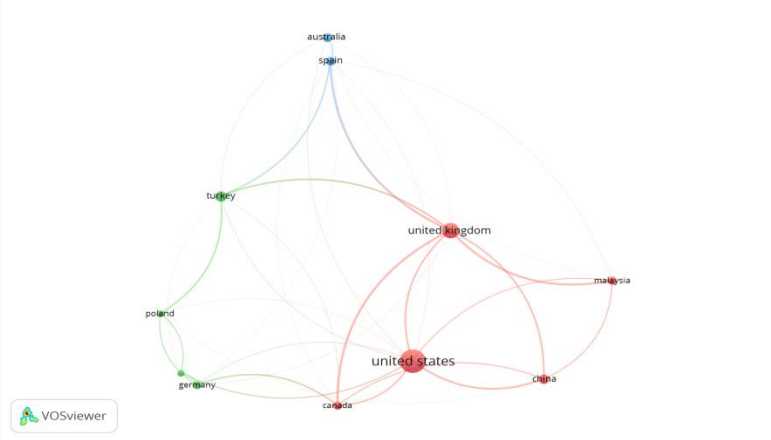

Fig. 4: Showing the Citation and Total Link Strength in document publication

1.3.2. Analysis of Top Organizations

In this research field, 516 organizations provide documents on social media usage and academic achievement. Table3 represents the top 6 organizations with the most significant number of citations. University of Edinburh is the top cited organization (232), University of Texux, United States (146) and university of Washington (Citation 109) are the remarkable top organizations. The figure 5 clearly shows the citation volume of different organizations.

Table 3: Showing the Top Organization with Most Significant No. of Citation

Organization	Documents	Citations
Department of Psychology, George Washington University, U.S.	2	109
University of Southern California, Los Angeles, U.S.	2	37
Department of public health and Informatics, Jahangirnagar University, Dhaka	2	41
Liggins Institute, University of Auckland, New Zeeland	2	11
Population Research Centre, University Of Texasat Austin, U.S.	2	146
School of Informatics, University of Edinburgh, Edinburgh, UK	2	232

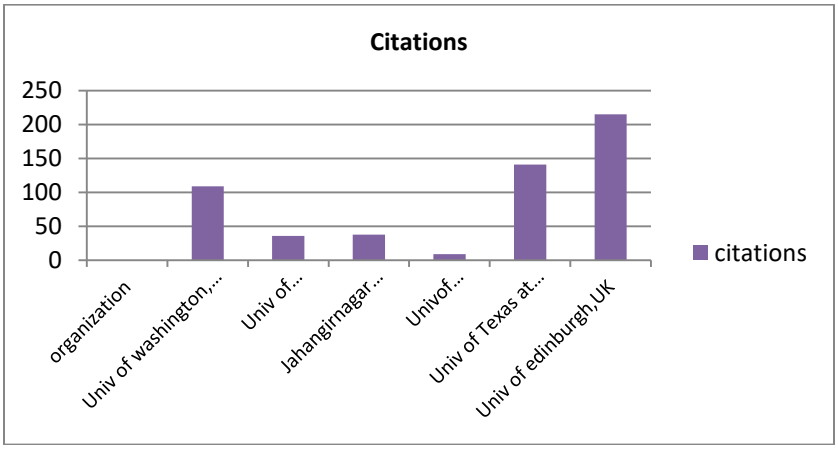

Fig.5: Showing the Citation Volume of Different Organizations

1.3.3. Analysis of Top Authors

A total of 19133 authors studied on social media use. Among them, only 12 authors have been selected based on the minimum numbers of citation as 20. These top ranked authors are represented in table 4.Griffith M.D takes the first position with regard to productivity and influence of the document citation. Other author Al-Rahm I W.M, has remarkable citations of documents (43). Figure8 represents the total strength of the co-citation link with other authors which is shown in below.

Table 4: Showing the Total Strength of the Co-citation Link with Other Authors

Author	Citations	Total Link Strength
Al-Rahmi W.M.	43	93
Andreassen C.S.	24	349
Billieux J.	25	359
Cohen J.	20	73
Crosnoe R.	20	220
Gadowk.D.	24	0
Griffiths M.D.	86	732
Hairj. J.F.	21	109
Kussd.J.	25	400
Yeagerd.S.	21	227
Pallesen S.	20	246
Junco R.	28	118

Fig.6: Showing the Total Strength of the Co-citation Link with Other Authors

Keywords Analysis

For each of the 1792 keywords, the total strength of the co-occurrence links with other keywords has been calculated. The key words with the greatest total link strength have been selected. No of keyword to be selected 1000. A co-occurrence network of 315 keywords was created with the help of VOS viewer.

The keywords networks are visually mapped in figure 7. For each keyword, the total link strength i.e. the total strength of the co-occurrence links with other keywords was calculated.

In this figure the size of each circle represents the frequency of the keyword occurrences. The above figure shows the seven clusters distinguished by seven different colors namely, Red, Green, Yellow, Blue, Purple, and Sky Blue each of which indicates the similar publication topic in the same cluster.

Table 5: Showing Cluster-wise the No. of Items, Links, Total Link Strength &Occurrence

Cluster Name	Items	Links	Total Link Strength	Occurrence
Red	76	7864	21933	914
Green	67	5899	14135	701
Blue	57	5023	11581	522
Yellow	51	5119	13440	526
Purple	38	3267	6318	257
Sky Blue	26	3123	4022	240

Red Cluster includes 76items with 7864links and 21933 total link strength whereas Green Cluster consists of 67 items with 5899 links and 14135 Total link strength. Similarly, Yellow Cluster has 51 items with 5119 links and 13440 total link strength. 57 Items with 5023 links and 11581 total link strength are included to Blue Cluster. Purple color includes 38 items with 3267 links and 6318 total strength links. With 26 item, 3123 links and 4022 total link strength Sky Blue Cluster is constructed.

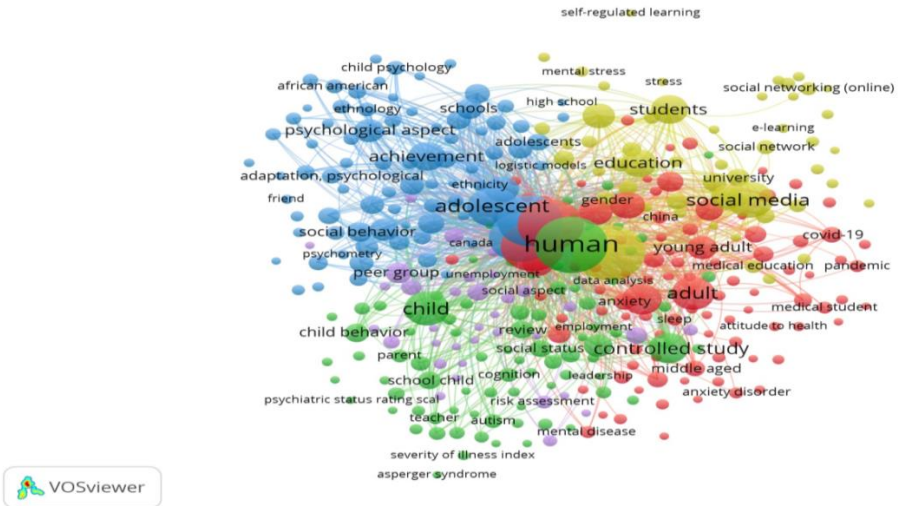

Fig.7: Showing Networks of 305 Key Words

Taking the minimum numbers of occurrence of a keyword as 50, only 9 keywords have been met the threshold.
For each of the nine keywords, the total strength of the concurrence links with other key words have been calculated
The keywords with the greatest link strength has been selected.
Table 6 shows the top 9 most recurrent keywords, which is presented in Fig 8 by the co-occurrence network of keywords in VOS Viewer.

Table 6: Showing 9 Topmost Recurrent Keywords

Keywords	Occurrence	Total Link Strength
Human	120	648
Article	109	641
Humans	107	629
Male	101	621
Female	101	615
Academic Achievement	123	583
Adolescence	64	409
Adult	55	367
Social Media	67	337

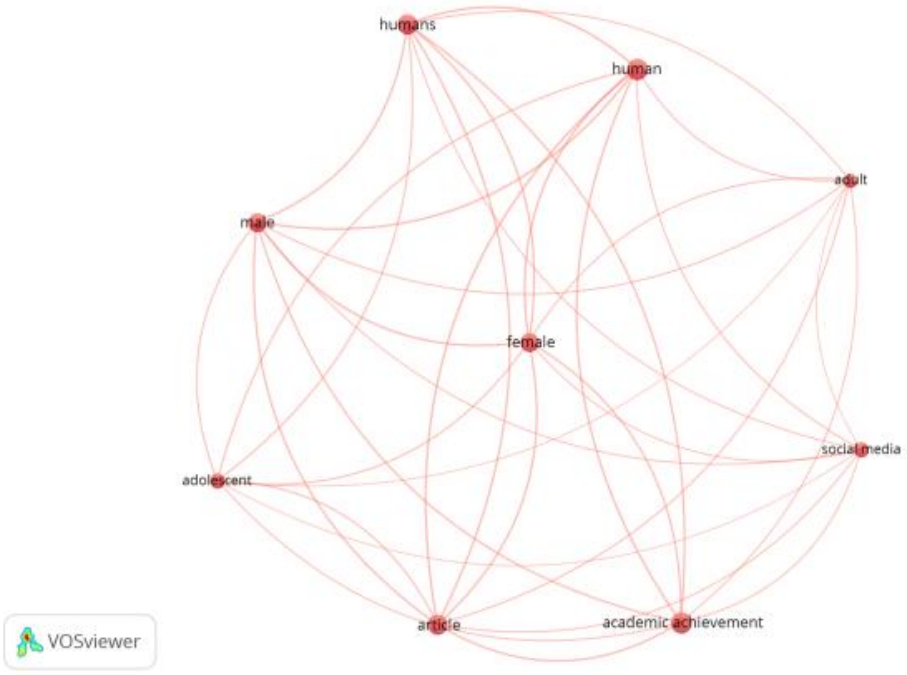

Fig. 8: Showing the Network of Top 9 Keywords

1.4. MODE OF RESEARCH ON SOCIAL MEDIA ACROSS DIFFERENT PARTS OF THE WORLD

The Scopus data provided a list of research works on social media usage and academic achievement. The inception of research in this field was in 1962. But the investigators considered the data from the year 2001 to 2023.From the data, it is clear that different countries play an essential role in exploring in this field. United States,

United Kingdom, Canada, China, and Turkey published a large number of research works during this period of study. There are also some countries that published articles on this field comparatively in small numbers. The countries were Taiwan, Germany, Netherlands, Iran, Lebanon, and Australia. Some countries like Bangladesh, India(4), Hungary (2), Poland(5), Indonesia, Italy, South Africa, Nigeria, Brazil, Mexico, Portugal, Romania, Slovenia gave less importance in this field. It is evident that different countries considered more or less for exploring on the field. This issue has gained the most importance since 2017. But after the pandemic situation in 2020, all the countries started thinking widely about this field. Fig. 9 shows the worldwide publications with the help of MS Excel. For each of the 68 countries, the total strength of the bibliographic coupling links with other countries has been calculated and presented in Fig. 10, and total 8 clusters were found according to the greatest link strength.

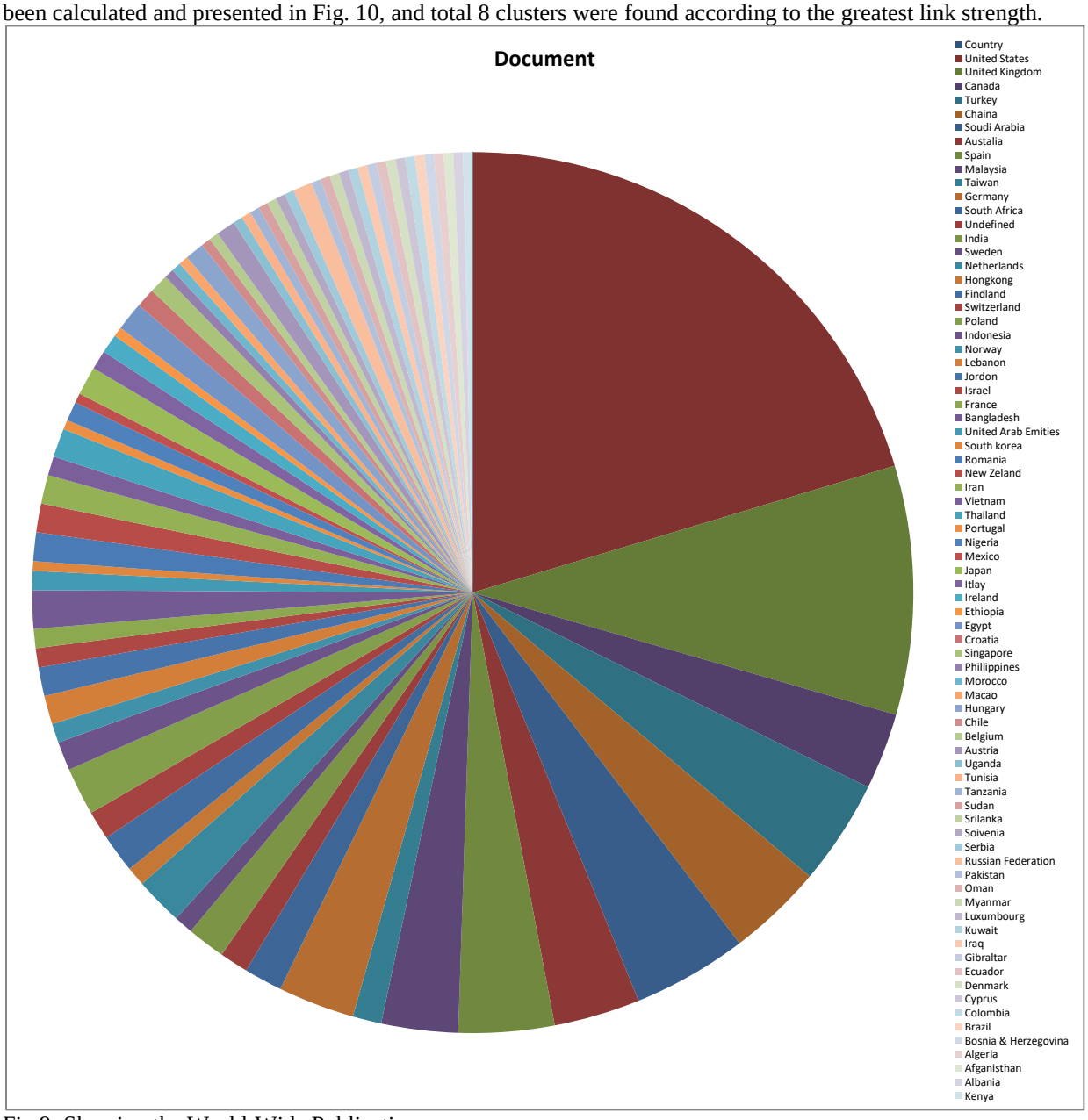

Fig.9: Showing the World-Wide Publications

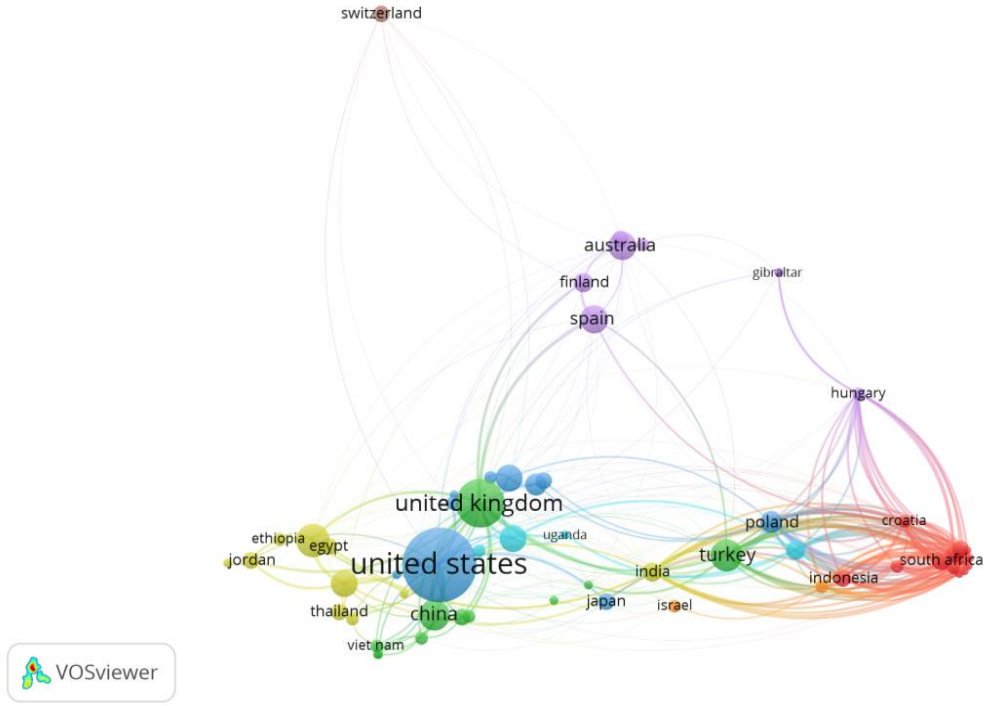

Fig.10: Showing the Total Strength of the Bibliographic Coupling Links with Other Countries

4.4.1. Cluster-1 (Red)

Table 7: Showing Citation Rate with Respect to Documents Published of the Countries in Cluster-1

Country	Documents	Citations	Total Link Strength	Average Citation (Total Citation /Total Documents)	Average Total Strength Link (Total Strength Link/Total Documents)
Brazil	1	73	1584	73	1584
Chile	1	73	1584	73	1584
Crocia	2	86	1646	43	823
Ecuador	1	73	1584	73	1584
Indonesia	3	100	1663	33.33	554.33
Iran	3	184	1584	61.33	528
Mexico	1	73	1584	73	1584
Nigeria	2	84	1585	42	793
Portugal	1	73	1584	73	1584
Romania	3	73	1585	24.33	528.33
Slovenia	1	73	1584	73	1584
South Africa	4	107	1590	26.75	397.5
UnitedArab Emirates	2	76	1360	38	680

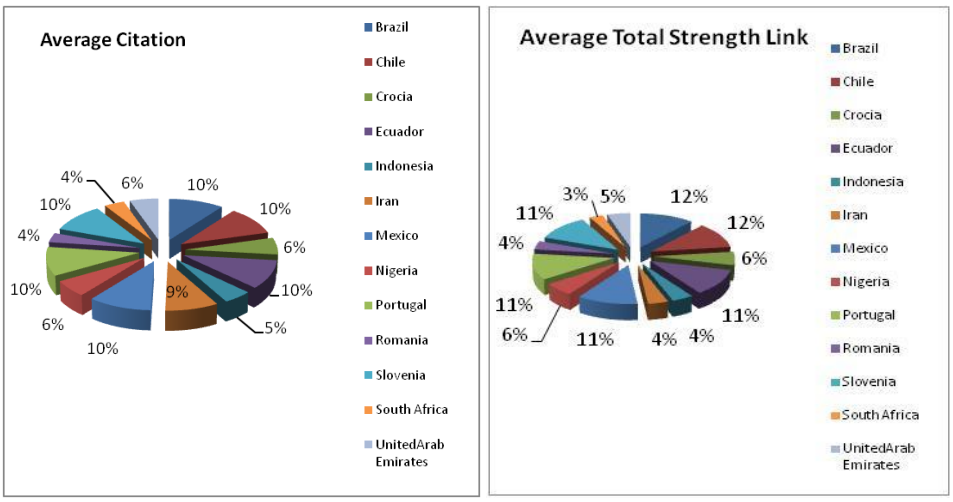

Fig.11: Showing the Average Citations as well as Average Strength Link of the Countries belonging to Cluster-1

From table 7 it is clear that South Africa has highest document publications but Iran has highest citations on the social media whereas average citation in this field of Brazil, Chile, Ecuador, Mexico, Portugal, and Slovenia are same. In case of average total strength link the said countries are equal also in numbers. The result is also depicted in the figure 11 in terms of percentage of pie charts.

4.4.2. Cluster: 2 (Yellow)

Table 8: Showing Citation Rate with Respect to Document Published of the Countries in Cluster-2

Country	Documents	Citations	Total Link Strength	Average Citation (Total Citation /Total Documents)	Average Total Strength Link (Total Strength Link/Total Documents)
Egypt	3	16	213	5.33	71
Ethiopia	2	1	50	0.5	25
India	4	90	1936	22.5	484
Jordan	3	51	438	17	146
Kuwait	1	0	45	0	45
Malaysia	8	161	856	20.13	107
Soudi Arabic	12	92	731	7.67	60.92
Singapore	2	52	213	26	106.5
South-Korea	1	4	159	4	159
Thailand	3	59	131	19.67	43.67

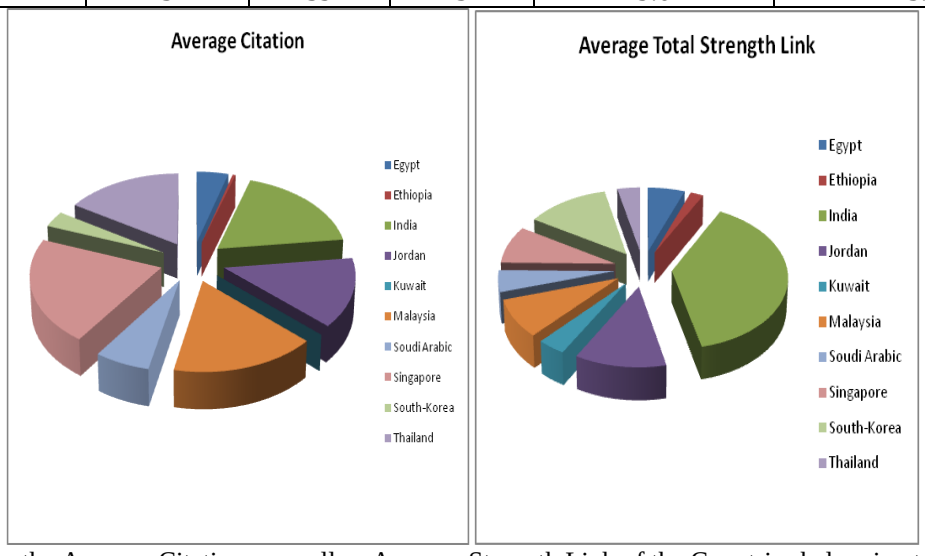

Fig.12: Showing the Average Citations as well as Average Strength Link of the Countries belonging to Cluster-2

Table 8 shows that Soudi Arabic has highest document publications with highest citation compared to other 9 countries of cluster 2. In case of total link strength India is in favorable position followed by Malyasia. But average citation is highest for Malayasia. The table also provides the fact that India is in pioneering position in case of average total strength link. Kuwait is falling behind in terms of average citation as well as average total strength link. The result is again depicted in figure 12.

4.4.3. Cluster-3 (Blue)

Table 9: Showing Citation Rate with Respect to Document Published of the Countries in Cluster-3

Country	Documents	Citations	Total Link Strength	Average Citation (Total Citation /Total Documents)	Average Total Strength Link (Total Strength Link/Total Documents)
Austria	2	100	169	50	84.5
Cyprus	1	13	6	13	6
Germany	8	213	400	26.63	50
Ireland	2	45	140	22.5	70
Japan	3	25	196	8.33	65.33
Kenya	1	40	62	40	62
Lebanon	3	180	126	60	42
Macao	1	3	109	3	109
Netherlands	5	234	184	46.8	36.8
Poland	5	124	1713	24.8	342.6
United States	58	2392	1665	41.24	28.70

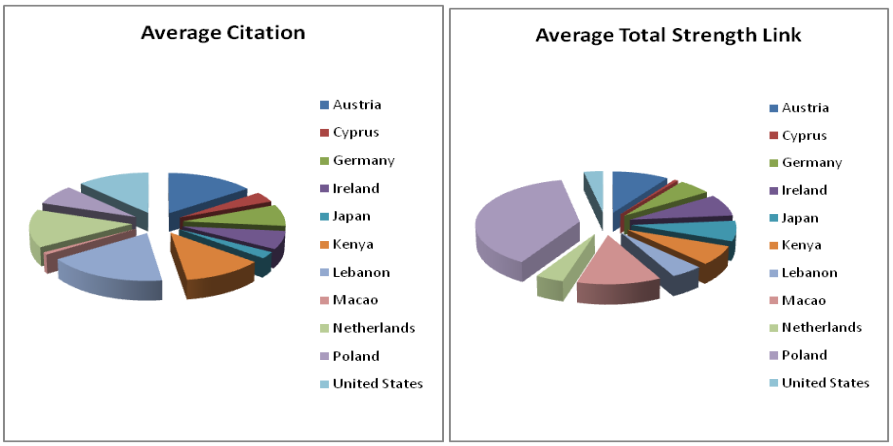

Fig.13: Showing the Average Citations as well as Average Strength Link of the Countries belonging to Cluster-3

United States belonging to cluster 3 has highest documents publication as well as highest citations in the field of social media use. Other countries of the cluster are in poor position in both publications and citations. In case of total link strength as well as average total strength link Poland is in favorable position. The table 9 also shows that Germany has maximum average citation compared to other countries except U.S. of the cluster. It is clear that each Macao and Kenya have published only one document in the field. Citation rate of Macao is very poor whereas citation rate of Kenya is up to the mark. Figure 13 also provides the fact.

4.4.4. Cluster-4 (Green)

Table 10: Showing Citation Rate with Respect to Document Published of the Countries in Cluster-4

Country	Documents	Citations	Total Link Strength	Average Citation (Total Citation /Total Documents)	Average Total Strength Link (Total Strength Link/Total Documents)
China	10	177	603	17.7	60.3
Hong Kong	2	99	312	49.5	156
Morrco	1	30	244	30	244
Oman	1	0	121	0	121
Philippines	1	1	11	1	11
Serbia	1	30	244	30	244
Sweden	2	124	504	62	252

Taiwan	3	170	394	56.67	131.33
Turkey	11	240	1901	21.82	172.82
UK	26	1054	1794	40.54	69
Vietnam	2	45	349	22.5	174.5

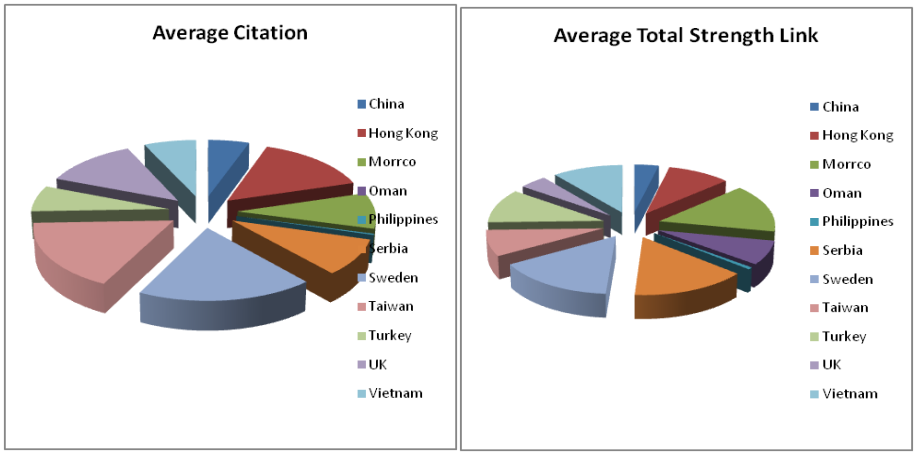

Fig.14: Showing the Average Citations as well as Average Strength Link of the Countries belonging to Cluster-4

From table 10 it is evident that China and Turkey with 10 and 11 documents respectively have 177 citations and 240 citations respectively. In case of total link strength Turkey is in advanced position followed by U.K. Sweden has maximum average citation compared to other countries of the cluster 4. It is interesting that Oman has null citation in the field. Vietnam has highest average total strength link whereas Philippines has minimum average total strength link. The result is also presented in broken pie charts in figure 14.

4.4.5. Cluster-5 (Purple)

Table 11: Showing Citation Rate with Respect to Document Published of the Countries in Cluster-5

Country	Documents	Citations	Total Link Strength	Average Citation (Total Citation /Total Documents)	Average Total Strength Link (Total Strength Link/Total Documents)
Australia	9	333	231	39.22	25.67
Finland	4	103	315	25.75	78.75
Gibralter	1	9	142	9	142
Hungary	2	82	1726	41	863
Lithuania	1	09	142	9	142
Newzealand	3	107	98	35.67	32.67
Norway	2	26	28	13	14
Spain	9	131	475	14.56	52.78

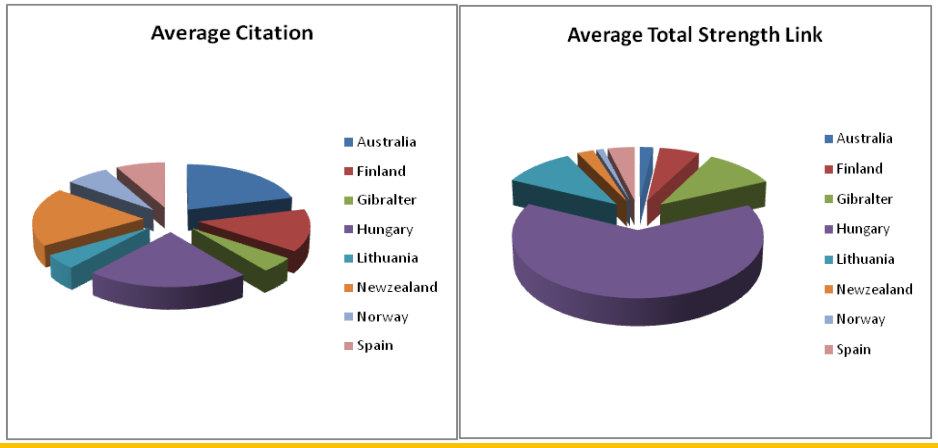

Fig.15: Showing the Average Citations as well as Average Strength Link of the Countries belonging to Cluster-5

Table 11states that both Australia and Spain have published same numbers of documents with different numbers of citations. Hungary has maximum total link strength whereas Norway has minimum total link strength. Average citation of Australia is greatest among other 7 countries. In figure 15 the above fact is presented in another way.

4.4.6. **Cluster-6 (Sky Blue)**

Table 12: Showing Citation Rate with Respect to Document Published of the Countries in Cluster-6

Country	Documents	Citations	Total Link Strength	Average Citation (Total Citation /Total Documents)	Average Total Strength Link (Total Strength Link/Total Documents)
Bangladesh	4	115	1908	28.75	477
Canada	8	198	652	24.75	81.5
France	2	4	80	2	40
Uganda	1	3	282	3	282

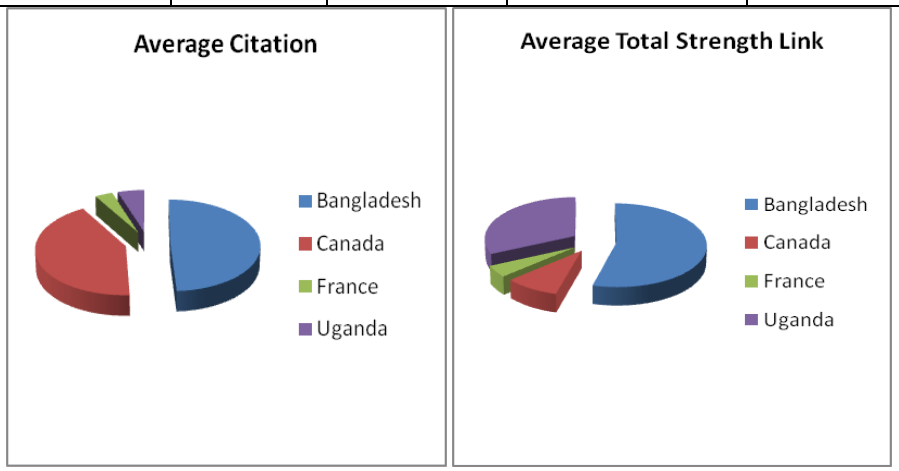

Fig.16: Showing the Average Citations as well as Average Strength Link of the Countries belonging to Cluster-6

In cluster 6 four countries have published documents in negligible numbers. The documents and citation of Canada are greatest among them. Bangladesh is in pioneering situation in case of total link strength as well as average total link strength. With one document published and three citations Uganda is in the lowest position. Figure 16 shows the fact again.

4.4.7. Cluster-7 (Brown)

Table 13: Showing Citation Rate with Respect to Document Published of the Countries in Cluster-7

Country	Documents	Citations	Total Link Strength	Average Citation (Total Citation /Total Documents)	Average Total Strength Link (Total Strength Link/Total Documents)
Luxembourg	1	9	118	9	118
Switzerland	3	30	127	10	42.33

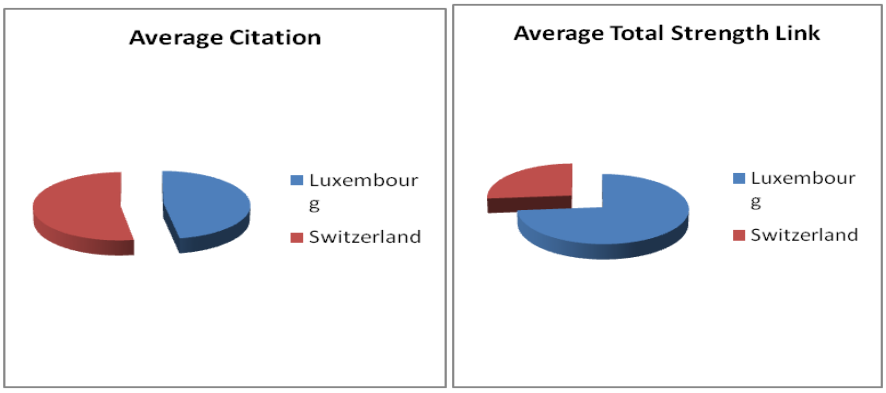

Fig.17: Showing the Average Citations as well as Average Strength Link of the Countries belonging to Cluster-7

Only two countries namely, Luxembourg and Switzerland are in cluster 7 which have no remarkable documents published. The first has one document with 9 citations whereas the second has three documents and 30 citations. Total strength link of Luxembourg and Switzerland are 118 and 127 respectively. This is depicted both in table 13 and figure 17.

4.4.8. Cluster-8 (Orange)

Table 14: Showing Citation Rate with Respect to Document Published of the Countries in Cluster-8

Country	Documents	Citations	Total Link Strength	Average Citation (Total Citation /Total Documents)	Average Total Strength Link (Total Strength Link/Total Documents)
Israel	2	17	45	8.5	22.5
Italy	2	90	1620	45	810

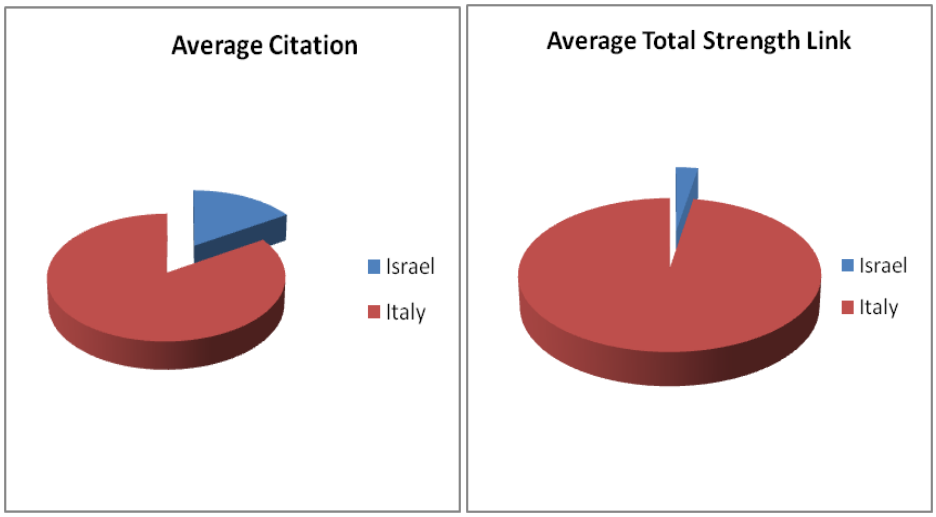

Fig.18: Showing the Average Citations as well as Average Strength Link of the Countries belonging to Cluster-8

Table 14 as well as figure20 presents that Italy occupies better position each in average citation, total link strength and average link strength compared to Israel.

Table 15: Showing Optimum Average Citation Rate as well as Strength Link

Cluster Name	Lowest Average Citation	Highest Average Citation	Average of Average Citation	Lowest Average Strength Link	Highest Average Strength Link	Average of Average Strength Link
C1	24.	73	54.36	397.5	1584	1062.17
C2	0	26	12.28	25	484	124.80
C3	3	60	30.57	6	342.6	81.54
C4	0	56.67	30.16	11	172.81	148.73
C5	9	41	23.4	14	863	168.86
C6	2	28.75	14.62	40	477	220.13
C7	9	10	9.5	42.33	118	80.16
C8	8.5	45	26.75	22.5	810	416.25

Table 15 represents that cluster 2 as well as cluster 4 have null lowest average citation which is lowest whereas, cluster 4 has highest highest average citation in comparison to other clusters. Cluster 3 with strength link 6 is on the lowest rank, and cluster 5 with strength link 863 in on the top. Cluster 1 has maximum average of average

citation whereas; cluster 7 with average of average citation 7 is in the bottom. Cluster 1 and cluster 7 have highest and lowest average strength link accordingly.

V. DISCUSSION

The data and information cited in the various tables and figures are discussed below.

From table-1 it is evident that the study in the field of social media use on academic purpose has increased gradually from the year 2001 to 2019 and increased rapidly from 2020 till now. Obviously, the numbers of publications in this field increased rapidly from COVID-19 Pandemic. During this pandemic most parts of the world were going through Lock Down and regular academic classes in schools and colleges and other educational institutions were hampered tremendously. As a result, the concept of online classes spread over the world. Even, after the pandemic situation being controlled, the students and scholars were accustomed in using social media for their academic purpose. Not only that, using social media for academic purpose gained popularity for its various advantages like easy access in getting information and data from internet, easy communications with peers, sharing information etc. for academic purpose. Therefore, the researchers are showing more interest in exploration in this field and that is why the numbers of publications are increasing rapidly.

Table 2 and figures 3&4 reflect the documents count, citations and total link strength of top 11 countries. The total documents published by Canada and China are only 8 and 10 respectively though Canada is the second largest country and China is one of third largest country in the world. According to Scopus Database it is obvious that Research on social media use is very poor in Canada, China and Australia. These countries show less interests in this field even after Covid-19 Pandemic. Only United States achieves highest position in publishing documents with highest citation and total link strength on social media use in academic achievement, followed by United Kingdom. Taiwan, Turkey, Germany, Netherlands, Iran and Lebanon being the small countries in size have shown some interests in exploration on the field of social media use.

Table 3 informs that the only six organizations namely, Department of Psychology, Georgewashington University, US; University of Southern California, Los Angeles, US; Department of Public Health and Informatics, US: Jahangirnagar University, Dhaka; Liggins Institute, University of Auckland, New Zealand; Population Research Centre, University of Texas at Austin, US; School of informatics, University of Edinburgh, UK in the world in which three are in United States played the pivotal role in exploring in social media use. School of informatics, University of Edinburgh acquired the highest citations of only two research documents on social media. This implies the high standard of the research in this field of the organization.

From Table 4 it is evident that total link strength of the author Griffith M.D. is highest thereby implying the counts of his publications in which two items occur at the same time. The author is followed by Kussd. J., Billieux J., and Andreassen C.S. whose total link strength is above 300.

Figure 7 shows the keyword occurrence which analyses the repeated use of the keywords in many literary works, the strength of the relationship among keywords. This figure clearly conveys the scenario of this research area and the different keywords which are frequently used in this research area. Yellow zone mainly represents total 51 items such as adolescence, smocking, adult, age, age distribution, alcohol consumption etc. Red zone displays 76 items such as achievement, adaption, psychological, ADHD, adaptive behaviour, adjustment etc. Green zone includes 67 items among which some are academic achievement, academic performance, anxiety disorder, communication, Corona Virus dicease-2019 etc. Blue zone represents 57 items which includes addiction, article, attention, behavior disorder assessment, emotion, economic aspect, etc. Purple zone(38 items) includes academic success, child, clinical article, exercise, normal human, middle school students etc. adolescence, aggression, infants, pre-school child, depression mental diseases, parents etc. belong to the sky blue zone (26 items).

Simultaneously, table-6 and the Fig. 8 explain each of the top 9 key words. The keyword 'Human' has highest occurrence and strongest Link strength and is indicated by its yellow color and largest front size in figure 7.This implies that, the keyword 'Human' was frequently used in different articles in this research area.

From the above table,-15 it is evident that different clusters comprising of different countries play the heterogeneous positions in exploring the role of social media use on academic achievement. Sewden belonging to Cluster 4 has highest average citation where as each Brazil, Chile, Ecuador, Mexico, Portugal, Slovenia, and the United Arab Emirates belonging to cluster 1 has highest average strength link. The countries Kuwait of cluster 2 and Oman of cluster 4 have null average citation documents. The average strength link of Cyprus belonging cluster 3 is lowest in comparison to other countries. The cluster 1 comprising of Brazil, Chile, Crocia, Ecuador, Indonesia, Iran, Mexico, Nizeria, Portugal, Romania, Sloviana, South Africa and United Arab Emirates ranks top in terms of both the average of average citation and average of average strength link. The table also shows that both average of average citation and average of average strength link are individually lowest for cluster7 in comparison to all

clusters. i.e the countries namely Luxembourg and Switzerland fall behind in exploring the impact of social media on education.

VI. INDIA'S ROLE IN SOCIAL MEDIA RESEARCH DURING THE PERIOD (2000-2023):

From the Scopus data, total of 1284 documents on social media and academic achievement were found. However, in this field, India's contribution is very poor. Only four studies were done in India from 2001 to 2023 by Alex J.K.et al. (2021), Sobaih, A. E. E., Palla, I. A., & Baquee, A. (2022); Deepa et. al. (2022)[2]and Jafaret. al.(2023)[7]. These authors undertook the studies mainly on the situation after the pandemic period where this field has gained attention in the year1962. Damija Alex et al. explored the impact of e-learning quality on the student's performance. Their study gained 54 citations. In general, the study gave quite consistent results across countries, gender, study fields, and levels of study. The author suggested incorporating e-learning issues as a basis for policy recommendations. Abu et. al. explored the use of social media in e-learning amid the COVID-19 Pandemic situation of the Indian Student's Perspective. Figure 9 shows the share of world wide publications in which India's role in social media research from 2001 to 2023 is noticed. The figure clarifies that very little work was done in this field compared to other countries (source: Scopus database).

VII. SUMMARY AND CONCLUSION

The present bibliometric study was confined in 1284 publications of last twenty-two years extracted from the Scopus database only. The basic objectives of the study were to examine the research trends related to the impact of social media on academic achievement as well as to identify the top most research countries across the world in this field, details of co-authorship, top scholars, leading authors and keywords. The VOS viewer program was used for map the frequency of the publications, keywords, clusters of co-authorship**,** Co-citation Link with other Authors.
The findings of the study provided the fact that the interest of research in this field has been increasing gradually, specially, high in the last decade. The numbers of publications in this field increased rapidly from COVID-19 Pandemic that necessitated the use of digital platforms. It is also evident that different countries occupied the different positions in exploring the role of social media use on academic achievement. The United States took the highest position amongst the ranked countries based on the document count, citation and total strength. Australia occupied the second place, and Netherlands the third, based on the citation. But, India's contribution was very poor. Only four studies were done in India from 2001 to 2023 Alex J.K.et al. (2021), Sobaih, A. E. E., Palla, I. A., & Baquee, A. (2022); Deepa V. et. al. (2022) and Jafaret. al.(2023). These authors undertook the studies mainly on the situation after the pandemic period where this field had gained global attention since the year1962.
In this study the out sketch and information of previous research on social media use will be beneficial for the future researchers, academicians and policy-makers to addressing this important issue in the digital society. As our study is confined to the Scopus database only, the findings are limited to some extent, and exact outcomes will be obtained if other sources of data available in PubMet, Web of Science etc. are considered for the study. Future researchers are expected to provide us the more facts of this field in greater details.

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