

Bibliometric Analysis of Research Publications of the University of Dhaka during 1971-2021: A Study

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Abstract: *Established in 1921, the University of Dhaka celebrated the 100 years of its establishment in 2021. As part of the celebration of this milestone, DU offered centennial research grants. The primary objectives of this project are to review the status of journals published by Dhaka University and examine and analyze the trend of scientific publications nationally and internationally for a period of 50 years from 1971 to 2021. We found that 13 faculties, 83 departments, 13 institutes and 56 research centers & bureaus of Dhaka University have published thirty-nine journals from 1971 to 2021. Collectively these journals have published 9,378 scientific articles in fifty years. The average publication of the journal per year is 187.56. Among these only 1148 scientific articles are available online. The Dhaka University Studies (Faculty of Arts) has published the highest number of scientific articles (1504) in 46 years. Researchers from 61 countries have collaborated with DU researchers and published in the DU journals. None of these journals are indexed by the leading databases like Scopus and Web of Science. The findings of this study help us to come up with some recommendations. Department-wise journal publications should be stopped and only the leading faculties of DU can take the responsibility to publish few journals with maintaining the standard set by the flagship journals. While the recent moves of DU show a positive direction to improve the ranking of this university, materializing these recommendations will further improve the ranking of Dhaka University.*

Keywords: *Scientific publications, Authorship, Collaborations, Dhaka University journals, Bibliometric, Centennial research*

Introduction

The University of Dhaka is the oldest and largest university in Bangladesh. Since its journey in 1921, this university has been playing an important role for building nation as well as creating new knowledge to develop the nation. Under the recent global university ranking by Times Higher Education (THE) Dhaka university ranked in between 601 to 800th position (THE, 2023). Dhaka University is taking different initiatives and offering research funds to improve the ranking. This

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university celebrated its centenary in 2021 with gorgeous and a number of national and international programs. But the research contributions of this university are not enlisted systematically and showcasing properly. Therefore, it has become essential to explore and expose the scholarly contributions of DU during the last 50 years particularly after the independence of Bangladesh e.g. from 1971 to 2021.

Review of Literature

Since late 60s, 'Bibliometrics' has been using as one of the important tools for examining the scientific publications of university and evaluating the scientific works (Beck and Manuel, 2008). Since then many researchers are using this tool in their research studies. Yusop *et al.* (2022) examined the scientific publications of the Universiti Teknologi Malaysia (UTM), and the heist number of publications found under the field of engineering and computer science. In addition, UITM became the top ranked university under the engineering and computer science in Malaysia. For examining the scientific publications of Alzahra University from 1986–2019, Doulani (2020) used bibliometrics method to analyze the scientific publications of this university. Under the number of publications and citations, there were upward trends during this period. The research collaboration was increased and mostly collaborated with the USA-based authors. However, majority of the authors published less which supports the 80/20 rules of publications (80% of scientific publications are published by 20% of authors). In a bibliometrics study in the University of the Punjab (PU) in Pakistan, Ahmad *et al.* (2020) examined the scientific publications of this university from Scopus database. Authors found some significant findings of research collaboration, open access journal publishing and citation patterns of Punjab University. Many similar studies were found in the context of different universities across the world. Xu, Mishra & Jones (2017) examined the worldwide research approach and activities in the field of multimorbidity to explore the limitations in knowledge and identify the importance of knowledge sharing between high income countries and low- and middle- income countries. For this purpose a comprehensive search was conducted to extract research publications from Web of Sciences in multimorbidity with special reference to Diabetes, Depression, Hypertension and Chronic Obstructive Pulmonary Disease. The analysis covered research output of 116 years from 1900 to 2016 and data for analysis was extracted from date of publications, subject category, author, title, abstract and keywords as well as full texts were obtained for the co-citation analysis.

There are few numbers of bibliometrics studies found in the context of Bangladesh. Some of these are; Library and information Science research publications in Bangladesh from 1971 to 2020 (Islam and Roy, 2021); publications and authorship patterns among the LIS researchers (Ahmed and Shuva, 2007). Khan *et al.* (1998) prepared a list of papers compiled for showing the growth and size of the scientific literatures of library and information science (LIS), patterns of their distribution by subjects within the field of librarianship, characteristics of

the contributing periodicals, language of publication, authorship patterns, and geographic distribution of the periodicals. Islam, Islam and Akter (2023) examined the fifty years of scientific publications of Dhaka University from Scopus database. Authors found that 9351 scientific publications published during fifty years which got cited 147,460 times (15.77 times per publication) and authors from institutions in 151 countries have published with most articles from USA, Japan and the UK. Bangladesh University of Engineering and Technology (BUET) and International Center for Diarrhoeal Disease Research, Bangladesh (icddr'b) were the highest collaborative organizations collaborated with Dhaka University researchers. While we see few numbers of publications found in the context of Dhaka University and Bangladesh, no bibliometric study found examining scientific publications of Dhaka university published in the DU journals.

Objectives and Research Questions

The specific objectives of this study are as follows:

- To explore the frequency of publication of the local journals over the past 50 years.
- To examine journal publication trends of various faculties, departments, institutes and research centers in DU.
- To determine the authorship patterns and international collaboration of those journals in the same period.

Research methodology

Data collection process

Phase 1: The project team looked at the Dhaka University Library (DUL) website as the very first initiative to excavate the journal titles, and DUL website seems very insignificant as there is partly information found of 16 journals.

Phase 2: A formal letter was issued to the librarian of DU central library to know if they have any other journal in their collection except the journals available on DUL website. But the librarian replied that DUL does not have any other journals in its collection other than the issues which have been uploaded on DUL website.

Phase 3: With the view to collect journal information manually from each of the entities of DU that publishes journal/s, the chief investigator prepared a general authorization letter requesting to deliver the journal issues to the bearer of the letter for a certain time with commitment that the issues of the journals will be handled very carefully during data entry and returned to respective office before or on the deadline. Four research assistants were deployed to visit the different departments, institutes and offices of DU. Finally; it is found that there are thirty nine journals which have been published between 1971 and 2021.

Phase 4: For analyzing the bibliographic information of the scientific publications, we have created an excel spreadsheet and filled up the fields with the selected information. We included journal name, faculty/institute/departments from where it is published, author name, year of publication, pattern of authorship (single/joint), author institutions, number of years the journal is publishing, citations in google scholar, DOI and ISSN (Print and Online). For the bibliometric studies these are the essential fields to analyze and identify the trends of scientific publications.

Data analysis and interpretation of DU publications

After collecting all the relevant journal publications nationally, we have analyzed and interpreted the publication information.

Table 1: Journals Published by the Faculty & Institute, DU (1971-2021)

Sl.no	Faculty/Institute Name (29)	Name of Journal (18)
1	Faculty of Arts	Arts Faculty Journal
2	Faculty of Arts	কলা অনুসন্ধান পত্রিকা
3	Faculty of Arts	The DU Studies
4	Faculty of Social Sciences	Social Science Review
5	Faculty of Social Sciences	সামাজিক বিজ্ঞান পত্রিকা
6	Faculty of Law	DU Law Journal
7	Faculty of Business Studies	The DU J. of Business Studies
8	Faculty of Science	The DU J. of Sciences
9	Faculty of Biological Sciences	The DU J. of Biological Sciences
10	Faculty of Pharmacy	DU J. of Pharmaceutical Sciences
11	Faculty of Earth and Environmental Sciences	DU J. of Earth and Environmental Sci.
12	Faculty of Engineering and Technology	DU J. of Applied Sci. and Engineering
13	Faculty of Fine Art	N/A
14	Faculty of Education	N/A
15	Faculty of Medicine	N/A
16	Faculty of Postgraduate Medical Sciences and Research	N/A
17	Institute of Education and Research	Teacher's World
18	Institute of Statistical Research and Training	Journal of Statistical Research
19	Institute of Business Administration	Journal of Business Administration
20	Institute of Nutrition and Food Science	Bangladesh Journal of Nutrition

21	Institute of Social Welfare and Research	The Journal of Social Development
22	Institute of Modern Languages	আধুনিক ভাষা ইনস্টিটিউট পত্রিকা
23	Institute of Health Economics	N/A
24	Institute of Information Technology	N/A
25	Institute of Energy	N/A
26	Institute of Disaster Management and Vulnerability Studies	N/A
27	Institute of Leather Engineering and Technology	N/A
28	Confucius Institute	N/A
29	Bangabandhu Sheikh Mujib Research Inst. for Peace & Libe.	N/A

Table 1 represents an overview of journal contribution by different faculties and institutions of the University of Dhaka (DU). The information about the availability of online journals and the numbers of articles published in the journals are listed in Table 2.

Table 2: Journals available in DU Library, Online (n=16)

Faculty/Institute Name	Name of Journal	Issue available	Articles
Faculty of Arts	Arts Faculty Journal	1	14
Department of English	Spectrum	1	17
Department of Arabic	The DU Arabic Journal	7	108
Department of Urdu	The DU J. of Urdu	1	19
Dept. of Info. Science & Library Manag.	Bangladesh J. of Library & Information Sci.	3	30
Department of Linguistics	The DU J. of Linguistics	2	21
Department of Sociology	Journal of Sociology	2	25
Faculty of Law	The DU Law Journal	29	187
Faculty of Business Studies	The DU J. of Business Studies	12	142
Faculty of Science	The DU J. of Sciences	24	419
Faculty of Biological Sciences	The DU J. of Biological Sciences	26	321
Faculty of Pharmacy	The DU J. of Pharmaceutical Sci.	29	288
Faculty of Earth and Environmental Sci.	The DU J. of Earth & Environ. Sci.	1	9

Faculty of Engineering and Technology	The DU J. of Appl. Sci. & Engineering	3	29
Institute of Stat. Research and Training	Journal of Statistical Research	19	139
Institute of Nutrition and Food Science	Bangladesh Journal of Nutrition	27	266
Total		187	2034

Table 2 represents the visibility of DU journals on its library website and indicates that all the issues of all journals are not available. It also depicts that the highest number of issues of a single journal (The DU J. of Pharmaceutical Sci.) is visible through DU library website. The present scenario of the total number of journals of DU published from 1971-2021 is enumerated in Table 3.

Table 3: Total Journals of DU, 1971-2021 (n=39)

Sl. no	Faculty/Department name	Name of Journal	Medium	Issue found Year (1971-2021)
1	Faculty of Arts	Arts Faculty Journal	English	2006 -2021
2	Faculty of Arts	কলা অনুসন্ধান পত্রিকা	Bangla	2006 -2021
3	Faculty of Arts	The DU Studies	English	1971 - 2016
4	Dept. of Bangla	সাহিত্য পত্রিকা	Bangla	1985 -2018
5	Dept. of English	Spectrum	English	1998 -2019
6	Department of Arabic	The DU Arabic J.	Arabic	2014 - 2020
7	Dept. of Per. Lan. & Lit.	The DU J. of Parsian	Arabic	2005 - 2011
8	Dept. of Urdu	The DU J. of Urdu	Urdu	2015
9	Dept. of Sanskrit	প্রাচ্যবিদ্যা পত্রিকা	Ban & Eng	2016 - 2020
10	Dept. of Philosophy	Philosophy & Progress	English	1981 -2019
11	Dept. of Philosophy	দর্শন ও প্রগতি	Bangla	1986 -2019
12	Dept. of Islm. Hist. & Cult	প্রবন্ধ সংকলন	Ban & Eng	1999 - 2020
13	Dept. of Inf. Sci. & Lib. mgt	Bangladesh J. of Lib. and Info. Science	English	1998 -2021
14	Dept. of Linguistics	The DU J. of Linguistics	Ban & Eng	2009 -2021
15	Faculty of Social Sciences	Social Science Review	English	1991 - 2021

16	Faculty of Social Sciences	সামাজিক বিজ্ঞান পত্রিকা	Bangla	2005 - 2020
17	Det. of Political Science	Bangladesh Political Science Review	English	2013 -2019
18	Dept. of Int. Rel.	Journal of International Relations	English	1993 - 2020
19	Dept. of Sociology	Journal of Sociology	English	2005 -2009
20	Dept. of Popu. Sci.	Journal of Population & Development	English	2014
21	Faculty of Law	The DU Law J.	English	1992 - 2016
22	Faculty of Business Studies	The DU J. of Business Studies	English	1989 - 2020
23	Dept. of Management	The Dhaka Univeristy J. of Managt.	English	1995 -2019
24	Dept. of Marketing	The Dhaka Univeristy J. of Marketing	English	1999 - 2018
25	Department of Finance	Journal of Finance & Banking	English	1991 - 2020
26	Dept. of Bank. & Insurance	Journal of Banking & Financial Service	English	2007 -2021
27	Dept. Manag. Info. Systems	Bangladesh J. of MIS	English	2009 - 2020
28	Faculty of Science	The DU J. of Sciences	English	1989 - 2021
29	Faculty of Bio. Sciences	The DU J. of Bio. Sciences	English	1992 -2021
30	Dept. of Psychology	The DU J. of Psychology	English	1990 - 2016
31	Faculty of Pharmacy	The DU J. of Phar. Sciences	English	2011 - 2020
32	Faculty of Ear. & Env. Sci.	The DU J. of Earth & Environmental Sci.	English	2015
33	Faculty of Engi. & Tech.	The DU J. of Applied Sci. & Eng	English	2016 - 2018
34	Inst. of Edu. & Research	Teacher's World	English	1983 -2017
35	Inst. of Stat. Res. & Train.	Journal of Statistical Research	English	1971 - 2018
36	Inst. of Bus. Admi.	Journal of Business Administration	English	1975 - 2021
37	Inst. of Nutr. & F. Sci.	Bangladesh Journal of Nutrition	English	1987 -2019
38	Inst. of Soc. Wel. & Res.	The Journal of Social Development	Ban & Eng	1992 - 2020

39	Inst. of Modern Languages	আধুনিক ভাষা ইনস্টিটিউট পত্রিকা	Ban & Eng	1984 - 2019
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NB: Information of ‘ঢাকা বিশ্ববিদ্যালয় পত্রিকা’ was not available during the data collection periods. We failed to add this journal information in our study from the existing departments, institutes, faculties and libraries. Hence, the total number of journals published by Dhaka University will be 40.

It is significant to notice that among all the journals, the journal published by the ‘Institute of Business Administration is the most regular and aged journal as since 1975 the institute is contributing its journal and it has published the latest issue of 2021. The total number of articles published per journal is demonstrated in Table 4 including coverage of year and average article per year.

Table 4: Number of articles per journal (n=39)

Sl. no	Name of Journal	No of articles published	No of year covers	Avg. article per year
1	Arts Faculty Journal	136	16	8.50
2	কলা অনুসন্ধান পত্রিকা	199	16	12.44
3	The DU Studies	1504	46	32.70
4	সাহিত্য পত্রিকা	184	34	5.41
5	Spectrum	146	22	6.64
6	The DU Arabic Journal	108	7	15.43
7	The DU Journal of Parsian	73	7	10.43
8	The DU Journal of Urdu	19	1	19.00
9	প্রাচ্যবিদ্যা পত্রিকা	73	5	14.60
10	Philosophy & Progress	331	39	8.49
11	দর্শন ও প্রগতি	296	34	8.71
12	প্রবন্ধ সংকলন	86	22	3.91
13	Bd. Journal of Library and Information Science	30	24	1.25
14	The DU Journal of Linguistics	108	13	8.31
15	Social Science Review	477	31	15.39
16	সামাজিক বিজ্ঞান পত্রিকা	110	16	6.88
17	Bangladesh Political Science Review	66	7	9.43
18	Journal of International Relations	107	28	3.82
19	Journal of Sociology	25	5	5.00

20	Journal of Population & Development	6	1	6.00
21	The DU Law Journal	187	25	7.48
22	The DU Journal of Business Studies	770	32	24.06
23	The DU Journal of Management	91	25	3.64
24	The DU Journal of Marketing	210	20	10.50
25	Journal of Finance & Banking	158	30	5.27
26	Journal of Banking & Financial Service	194	15	12.93
27	Bangladesh Journal of MIS	65	12	5.42
28	The DU Journal of Sciences	683	33	20.70
29	The DU Journal of Biological Sciences	624	30	20.80
30	The DU Journal of Psychology	212	27	7.85
31	The DU Journal of Pharmaceutical Sci.	288	10	28.80
32	The DU Journal of Earth & Environmental Sci.	9	1	9.00
33	The DU Journal of Applied Sci. & Engineering	29	3	9.67
34	Teacher's World	244	35	6.97
35	Journal of Statistical Research	528	48	11.00
36	Journal of Business Administration	327	47	6.96
37	Bangladesh Journal of Nutrition	266	33	8.06
38	The Journal of Social Development	214	29	7.38
39	আধুনিক ভাষা ইনস্টিটিউট পত্রিকা	195	36	5.42
	Total	9378		

Table 4 summarizes the total number of articles and average yearly number of articles contributed by per journals in the designated period. It shows that the total number of articles contributed by each journal during the research period varies significantly. Hence, majority of DU journals have contributed less than two-fifty articles. The total number of publications during the last fifty years (1971-2021) has been depicted in Table 5.

Table 5: Number of publications (1971-2021)

Year	No. publication	NP%	CC	Year	No. publication	NP%	CC
1971	25	0.27	25	1997	218	2.32	2747
1972	29	0.31	54	1998	217	2.31	2964
1973	21	0.22	75	1999	222	2.37	3186
1974	50	0.53	125	2000	157	1.67	3343
1975	48	0.51	173	2001	164	1.75	3507
1976	44	0.47	217	2002	156	1.66	3663
1977	37	0.39	254	2003	223	2.38	3886
1978	38	0.41	292	2004	222	2.37	4108
1979	58	0.62	350	2005	313	3.34	4421
1980	35	0.37	385	2006	311	3.32	4732
1981	60	0.64	445	2007	234	2.50	4966
1982	119	1.27	564	2008	283	3.02	5249
1983	105	1.12	669	2009	240	2.56	5489
1984	125	1.33	794	2010	365	3.89	5854
1985	87	0.93	881	2011	344	3.67	6198
1986	132	1.41	1013	2012	415	4.43	6613
1987	135	1.44	1148	2013	391	4.17	7004
1988	120	1.28	1268	2014	313	3.34	7317
1989	116	1.24	1384	2015	296	3.16	7613
1990	137	1.46	1521	2016	392	4.18	8005
1991	117	1.25	1638	2017	265	2.83	8270
1992	150	1.60	1788	2018	359	3.83	8629
1993	169	1.80	1957	2019	326	3.48	8955
1994	185	1.97	2142	2020	287	3.06	9242
1995	225	2.40	2367	2021	136	1.45	9378
1996	162	1.73	2529	Total	9378		

Table 5 reflects the yearly contribution of articles by the DU journals. It is obvious that there is constant growth in article publication by DU journals because in 1971, only 25 (0.27% of the total number of articles during 1971-2021) articles were published whereas by the first half of 2021, number of articles contributed is 136. However, remarkable number of articles like 415 was published in 2012 and the rate was 4.43% of the total number of articles. The scenario of authorship under different faculties, institute and decade during the last fifty years has been demonstrated in Table 6 (a), 6(b) and 6(c).

Table 6 (a): Faculty-wise authorship (1971-2021)

Among 14 faculties of DU nine faculties have their own journal so for the analysis of faculty wise authorship patterns those journals have been considered and data collected from those journals has been distributed in the following table.

Decade	Name	1	2	3	4	4+	Total	Decade	Name	1	2	3	4	4+	Total
1971-1980	FA	243	32	15	2	0	292	1971-1980	FBioS	0	0	0	0	0	0
1981-1990	FA	679	79	28	18	6	810	1981-1990	FBioS	4	3	0	0	0	7
1991-2000	FA	471	41	30	13	4	559	1991-2000	FBioS	50	60	54	42	21	227
2001-2010	FA	610	103	13	1	1	728	2001-2010	FBioS	25	90	60	47	37	259
2011-2020	FA	810	32	4	0	0	846	2011-2020	FBioS	12	102	99	57	40	310
2021	FA	47	6	2	1	2	58	2021	FBioS	1	4	11	11	6	33
Total		2860	293	92	35	13	3293	Total		92	259	224	157	104	836
1971-1980	FSS	0	0	0	0	0	0	1971-1980	FP	0	0	0	0	0	0
1981-1990	FSS	0	0	0	0	0	0	1981-1990	FP	0	0	0	0	0	0
1991-2000	FSS	139	33	7	1	0	180	1991-2000	FP	0	0	0	0	0	0
2001-2010	FSS	127	66	16	1	31	241	2001-2010	FP	0	0	0	0	0	0
2011-2020	FSS	211	121	21	3	1	357	2011-2020	FP	0	3	24	58	203	288
2021	FSS	4	8	0	1	0	13	2021	FP	0	0	0	0	0	0
Total		481	228	44	6	32	791	Total		0	3	24	58	203	288
1971-1980	FL	0	0	0	0	0	0	1971-1980	FEES	0	0	0	0	0	0
1981-1990	FL	0	0	0	0	0	0	1981-1990	FEES	0	0	0	0	0	0
1991-2000	FL	39	0	0	0	0	39	1991-2000	FEES	0	0	0	0	0	0
2001-2010	FL	88	13	0	0	0	101	2001-2010	FEES	0	0	0	0	0	0
2011-2020	FL	32	15	0	0	0	47	2011-2020	FEES	1	1	3	3	1	9
2021	FL	0	0	0	0	0	0	2021	FEES		0	0	0	0	0
Total		159	28	0	0	0	187	Total		1	1	3	3	1	9
1971-1980	FBS	0	0	0	0	0	0	1971-1980	FET	0	0	0	0	0	0
1981-1990	FBS	20	9	0	0	0	29	1981-1990	FET	0	0	0	0	0	0
1991-2000	FBS	134	112	33	0	0	279	1991-2000	FET	0	0	0	0	0	0

2001-2010	FBS	127	160	140	21	0	448	2001-2010	FET	0	0	0	0	0	0
2011-2020	FBS	210	419	91	4	0	724	2011-2020	FET	2	9	7	9	2	29
2021	FBS	4	4	0	0	0	8	2021	FET	0	0	0	0	0	0
Total		495	704	264	25	0	1488	Total		2	9	7	9	2	29
1971-1980	FS	0	0	0	0	0	0								
1981-1990	FS	5	1	2	1	2	11								
1991-2000	FS	32	34	24	18	5	113								
2001-2010	FS	27	69	43	35	34	208								
2011-2020	FS	21	102	100	58	52	333								
2021	FS	1	8	4	2	3	18								
Total		86	214	173	114	96	683								

Table 6(a) reflects faculty wise summary of authorship patterns of the research contribution reported by DU journals. The data in this table represents that single authorship is popular in the researches of the faculties of arts, social sciences, business studies and law whereas joint authorship is dominant in the researches of the faculties of sciences, engineering, bio-sciences and pharmacy. It is significant to mention that in the first decade there was no research that has more than four authors.

Table 6 (b): Institute-wise authorship (1971-2021)

Although there are 13 institutes in DU, all of them do not have their own journals so institute wise authorship pattern under this research will not reflect the whole pictures of research output by all institutes. Only institutes that have their own journals have been covered by this research and the data has been distributed in the table below.

Decade	Name	1	2	3	4	4+	Total	Decade	Name	1	2	3	4	4+	Total
1971-1980	IER	0	0	0	0	0	0	1971-1980	INFS	0	0	0	0	0	0
1981-1990	IER	12	1	0	0	0	13	1981-1990	INFS	9	18	17	6	11	61
1991-2000	IER	13	11	7	1	0	32	1991-2000	INFS	4	28	25	19	20	96
2001-2010	IER	26	37	14	0	0	77	2001-2010	INFS	0	16	20	9	27	72
2011-2020	IER	21	57	44	0	0	122	2011-2020	INFS	0	6	13	10	8	37
2021	IER	0	0	0	0	0	0	2021	INFS	0	0	0	0	0	0
Total		72	106	65	1	0	244	Total		13	68	75	44	66	266

1971-1980	ISRT	35	22	5	0	0	62	1971-1980	ISWR	0	0	0	0	0	0
1981-1990	ISRT	35	40	5	0	0	80	1981-1990	ISWR	0	0	0	0	0	0
1991-2000	ISRT	52	79	22	3	1	157	1991-2000	ISWR	40	13	0	0	0	53
2001-2010	ISRT	53	76	36	5	1	171	2001-2010	ISWR	22	18	4	0	0	44
2011-2020	ISRT	16	21	12	3	6	58	2011-2020	ISWR	75	35	7	0	0	117
2021	ISRT	0	0	0	0	0	0	2021	ISWR	0	0	0	0	0	0
Total		191	238	80	11	8	528	Total		137	66	11	0	0	214
1971-1980	IBA	30	1	1	0	0	32	1971-1980	IML	0	0	0	0	0	0
1981-1990	IBA	89	15	2	1	0	107	1981-1990	IML	17	0	1	0	0	18
1991-2000	IBA	40	19	8	0	0	67	1991-2000	IML	22	0	0	0	0	22
2001-2010	IBA	27	26	23	0	0	76	2001-2010	IML	67	17	1	0	0	85
2011-2020	IBA	6	13	18	0	0	37	2011-2020	IML	53	17	0	0	0	70
2021-	IBA	3	1	4	0	0	8	2021	IML	0	0	0	0	0	0
Total		195	75	56	1	0	327	Total		159	34	2	0	0	195

Table 6(b) is the representation of authorship pattern in the research output by different institutes of DU. It is evident from the table data that research by single author is predominant in the institutes that conduct research and education in the field of arts, social sciences and business. On the contrary, in the field of physical and biological sciences prefer joint authorships.

Table 6 (C): Decade wise number of authorship

This research has covered scientific publications by different entities of DU from 1971 to 2021 that is research output of five decades which have been displayed by the following table.

SI No	Decade	1	2	3	4	4+	No. of articles
D1	1971-1980	308	55	21	2	0	386
D2	1981-1990	870	166	55	26	19	1136
D3	1991-2000	1036	430	210	97	51	1824
D4	2001-2010	1199	691	370	119	131	2510
D5	2011-2020	1470	953	443	205	313	3384
D6	2021-	60	31	21	15	11	138
D1-D6	Total	4943	2326	1120	464	525	9378

Decade wise analysis of research output by all entities together represents that single authorship is much higher than joint authorship and among publications by joint authorship there is a trend of decreasing number of publications with the increase in number of authorship.

Faculty and Institute wise collaboration with DU, DU and others in BD and international

The status of faculty and institute wise collaboration with DU, DU and other academia in BD and other countries of the world is mentioned in Table 7.

Table 7: Faculty and Institute Wise Collaboration (DU, DU and others in BD and international)

S.No	Name	DU	DU & Oth BD	Int	Total	Sl.No	Name	DU	DU & Oth BD	Int	Total
1	FA	3210	50	33	3293	9	FET	22	6	1	29
2	FSS	614	127	50	791	10	IER	153	78	13	244
3	FL	178	4	5	187	11	ISRT	122	2	404	528
4	FBS	1057	396	35	1488	12	IBA	248	42	37	327
5	FS	522	145	16	683	13	INFS	232	27	7	266
6	FBioS	662	144	30	836	14	ISWR	175	35	4	214
7	FP	202	69	17	288	15	IML	182	8	5	195
8	FEES	8	0	1	9		Total	7587	1133	658	9378

Table 7 reflects DU researchers' collaboration with other DU researchers, researchers from other institute of Bangladesh (BD) and international research community.

Faculty and Institute wise collaboration (national and international) with the percentages

The faculty and institute wise collaboration with national and international level are shown, using the percentage in Table 8.

Table 8: Faculty and Institute Wise Collaboration (National and International) with %

Sl.No	Name	Nat	%	Int	%	Total	Sl.No	Name	Nat	%	Int	%	Total
1	FA	3260	99.00	33	1.00	3293	9	FET	28	96.55	1	3.45	29
2	FSS	741	93.68	50	6.32	791	10	IER	231	94.67	13	5.33	244
3	FL	182	97.33	5	2.67	187	11	ISRT	124	23.48	404	76.52	528
4	FBS	1453	97.65	35	2.35	1488	12	IBA	290	88.69	37	11.31	327
5	FS	667	97.66	16	2.34	683	13	INFS	259	97.37	7	2.63	266
6	FBioS	806	96.41	30	3.59	836	14	ISWR	210	98.13	4	1.87	214

7	FP	271	94.10	17	5.90	288	15	IML	190	97.44	5	2.56	195
8	FEES	8	88.89	1	11.11	9		Total	8720	92.98	658	7.02	9378

Table 8 data represents that DU research collaboration enjoys national collaboration greater than international collaboration. It shows that, on an average 90% of the research published by different faculties and institutes has national collaboration.

Decade wise collaboration in national and international level

The decade wise collaboration in national and international level during the last fifty years is noted in Table 9.

Table 9: Decade Wise Collaboration (National and International)

SI No	Decade	National	Int.	Total
D1	1971-1980	366	19	385
D2	1981-1990	1053	83	1136
D3	1991-2000	1637	185	1822
D4	2001-2010	2282	229	2511
D5	2011-2020	3249	139	3388
D6	2021	133	3	136
D1-D6	Total	8720	658	9378

Table 9 reveals that DU has an increasing trend of research collaboration with different national and international entities. From the first to the fifth decades covered under this research national collaboration has increased gradually however international collaboration has decreased dramatically in the fifth decade however, there is a huge lift in national research collaboration from fourth to fifth decades.

Faculty and/or Institute wise citation (GS) pattern

The faculty and/or institute wise citation (GS) pattern is dispersed in Table 10.

Table 10: Faculty/Institute wise Citation (GS) pattern

Sl. No	Name	Article	Citations (GS)	Avg Citation per article	Sl. No	Name	Article	Citations (GS)	Avg Citation per article
1	FA	3293	1884	0.75	9	FET	29	10	0.29
2	FSS	791	246	0.31	10	IER	244	194	0.80
3	FL	187	55	0.29	11	ISRT	528	1399	2.65
4	FBS	1488	1612	0.92	12	IBA	327	233	0.71
5	FS	683	1126	1.08	13	INFS	266	490	1.84
6	FBioS	836	1339	1.60	14	ISWR	214	12	0.06

7	FP	288	1445	5.01	15	IML	195	34	0.17
8	FEES	9	4	0.44		Total	9378	10083	0.93

Table 10 provides the distribution of citation count against the total number of articles published by different faculties and institutes of DU along with average citation per article. The data reveals that FP is in the leading position in terms of receiving citations which is followed by ISRT and the citation per article are above five and around three respectively.

Status of online availability

The present status of online availability of the articles published in the journals during the period of 1971 to 2021 is summarized in Table 11.

Table 11: Online availability

Sl No	Name	Article	DOI	Bangla Jol	ISSN Online	ISSN Print
1	FA	3293	3	45	76	1355
2	FSS	791	15	15	2	553
3	FL	187	0	0	0	188
4	FBS	1488	0	0	133	987
5	FS	683	298	298	419	682
6	FBioS	836	144	308	322	836
7	FP	288	0	0	254	254
8	FEES	9	0	0	0	9
9	FET	29	0	0	0	29
10	IER	244	0	0	0	235
11	ISRT	528	0	0	0	487
12	IBA	327	0	0	16	129
13	INFS	266	0	22	0	266
14	ISWR	214	0	0	0	0
15	IML	195	0	0	0	127
	Total	9378	460	688	1222	6137

Table 11 indicates that the online visibility of DU research output is very poor as majority of the articles do not have DOI or journals do not have online ISSN. Among 15 faculties of DU, articles from only four faculties have got DOI number and articles from five faculties including those four have enlisted into Bangla Jol (an open access journal platform of Bangladesh).

Country wise author affiliations in the articles

The country wise author affiliations are shown in Table 12.

Table 12: Author affiliations in the articles (Country Information)

Sl. No	Country	No. of Authors	Sl. No	Country	No. of Authors	Sl. No	Country	No. of Authors
1	India	278	22	Poland	5	43	Norway	2
2	U.S.A	197	23	South Africa	5	44	Papua New Guinea	2
3	Canada	102	24	Sweden	5	45	Philippines	2
4	Australia	41	25	Austria	4	46	Russia	2
5	Japan	33	26	Czech Republic	4	47	Slovakia	2
6	Saudia Arabia	30	27	Finland	4	48	Ukraine	2
7	U.K.	29	28	Hong Kong	4	49	West Indies	2
8	Nigeria	21	29	Mexico	4	50	Ireland	1
9	Malaysia	16	30	Pakistan	4	51	Jamaica	1
10	Germany	14	31	Egypt	3	52	Kenya	1
11	China	12	32	Hungary	3	53	Myanmar	1
12	Iran	11	33	Indonesia	3	54	Namibia	1
13	Brazil	9	34	Italy	3	55	Oman	1
14	Thailand	9	35	Mauritius	3	56	Prague	1
15	Jordan	8	36	Zimbabwe	3	57	Qatar	1
16	Taiwan	8	37	Algeria	2	58	Scotland	1
17	South Korea	7	38	Bahrain	2	59	South Sudan	1
18	Kuwait	6	39	Libya	2	60	Switzerland	1
19	Singapore	6	40	Louisiana	2	61	Syria	1
20	Slovak Republic	6	41	Nepal	2			
21	Turkey	6	42	Netherlands	2			

Table 12 reveals that there were authors from 61 countries who collaborated with the DU researchers and faculty members.

Findings and discussion

During a fifty-year time span from 1971 to 2021, we see that 39 journals have been published by different departments, faculties and institutes of DU. Among these journals 18 are published by different faculties, institutes and remaining 21 journals are published by different departments. Only two journals namely 'The Dhaka University Studies' and 'Journal of Statistical Research' have been publishing since 1971. The 'Journal of Business Administration' published by the 'Institute of Business Administration (IBA)' is being publishing regularly since 1975. However, most of the DU journals are not publishing regularly. Despite this, there are good trends that many faculties, departments, institutes and centers are publishing journals. At this moment, none of the journals published by Dhaka University are listed by the major indexing databases like Scopus, Web of Science, PubMed, EBSCO and others. Even most of these journals are not listed under DU library website and BanglaJOL.

Under the name 'Dhaka University Journals' in DU Website, we see that only 16 journals are listed with few issues. In BanglaJOL database 166 Bangladeshi journals are enlisted but the number of journals listed from Dhaka University remains low. Though Arts Faculty journal is enlisted in the BanglaJOL, only single issue information is available in the BanglaJOL website. Like this, very few scientific publications are found and uploaded in the Dhaka University Institutional Repository. Out of 9378 scientific publications published by DU journals, we found that only 460 publications have DOI number, 688 journals are found in the BanglaJOL and 1222 journals have online ISSN number.

During these fifty years, the average number of scientific publications per year is 187.56. The Dhaka University Studies from the Faculty of Arts has published highest number of publications that is 1504 in 46 years and the average number of publications of this journal per year is 32.70. Collaborative scientific publications in DU journals are less appeared and not popular. Single authorship is popular by the authors in the faculty of Arts, Social Sciences and Business Studies. The good trends of collaborative publications and joint authorships have been more appeared in the Faculty of Science and Biosciences. However, an opposite trend in authorship found in the last two decades that is single authorship had reduced over the decades and joint authorship had risen in this time.

In case of research collaboration with researchers from other institutions/universities, we found that research collaboration within DU is higher than between DU and other organizations in BD. It is also found that only 7.02% (658) of the total publications of DU journals (9378) have international authorship from abroad. Authors from 61 countries have contributed and collaborated with these 7.02% publications. In the DU journals, authors from India, USA, Canada, Australia and Japan have made more scientific publications with the DU researchers. The DU Journal of Pharmaceutical Science was the only journal of DU which was listed in the SCImago journal ranking and indexed by the Scopus. But now this journal is no longer be listed in Scopus. Considering the regular publications and global authorships, this journal has got the highest citations in the Google Scholar (average citation per article 5.01) which is followed by ISRT journal (2.65 citations per article), INFS journal (1.84 citations per article), Faculty of Science journal (1.08 citations per article) and Faculty of Biosciences journal (1.60 citations per article). However, the rest of the journal articles of DU have got a lower count which is below 1 citation per article.

Conclusion and recommendations

Collecting scientific publications' information from the 39 local journals of DU, we have observed an overall upward growth of scientific publication by researchers of DU. The journals published from DU have low publication visibility as most of these journals are not listed in the BanglaJOL or in the university library website, most of the journals do not have DOI number and are not published regularly.

Hence, we have come up with some recommendations to improve this existing scenario. Some of the major suggestions are listed below.

- Dhaka University should encourage publishing journals by the dean office of different faculties rather than publishing under the department. Because most of the journals which are published by the departments are irregular in publications. Therefore, few of the faculties can take a lead to publish one journal considering the faculty intake.
- Initially, the top five oldest and regularly publishing journals under different faculties can be considered for the pilot project. Some initiatives like withdrawing the restrictions of authorship, inviting national and international experts of the respective fields in the editorial board, setting up a language club for the writers, encouraging more collaboration between universities and countries should be taken immediately. Open access online journal management system should be introduced for the top five listed journals of Dhaka University. The back issues of these selected journals should be scanned and inserted bibliographic information using the standard meta data protocol which works in line with other journal indexing systems.
- The top listed five journals of DU should follow the standard guidelines of submitting articles set by the commercial publishers and flagship journals. The journal article review policy should be revised and adopted standard peer review policy in line with the standard journals. It is essential to organize regular scientific writing workshops for the faculty members.
- For improving the publication visibility of the DU journals, all publications should be made available on DU library website, BanglaJOL and Dhaka University Institutional Repository under the green open access and creative common policy set by the publishers. Availability of DU journal publication in the Google Scholar, ResearchGate, ORCID, Academia and other research platforms would increase the possibility to be seen and cited by other researchers. Moreover, engaging in social network communities, creating and keeping up to date online profile of faculty members, organizing post-publication sessions and outreaching communities through open access mechanism can improve the visibility and citations of DU researches.
- The different global ranking organizations of universities have made weight categories on teaching, research, citations, international outlook and industry income. While there are lots of discussions and critiques about the lower rank of Dhaka University, the increased number of research publications, visibility of these publications and citations will help to gain weight on research score.

- As per SCImago journal and country rank, we can see that there are 13 journals listed from Bangladesh in the Scopus and none of these journals are from Dhaka University. DUJPS can take the lead to work on how to join the Scopus platform. DUJPS was listed earlier in the Scopus and failed to maintain the standard and features set by the Scopus. Perhaps, DU authority can take a pilot project and select 2 or three journals to be listed in the Scopus.
- Dhaka University library can update the DU Journals' site by adding the remaining titles of the DU journals. Giving all the bibliographic information of the scientific articles published by the DU journals can help the international community to know what has been published by DU researchers. Perhaps, uploading the DU journal and article information in the portal would help the community to get all the information in easy and convenient way.

Finally, this paper has number of limitations as well.

- We are not sure about how many journals are left for this project as we do not have any primary data. For example, we missed adding journal information of ‘ঢাকা বিশ্ববিদ্যালয় পত্রিকা’ in this study. We did not get information of this journal from the departments, institutes, faculties, research centers and libraries. Later, we came to know that this journal is published centrally by Dhaka University not from any departments, institutes, centers and faculties. Likewise a faculty can publish papers in other Bangladeshi journals like Asiatic Society or abroad like Indian/Malaysian journals which are neither the DU journals nor listed in the Scopus.
- Considering the coverage and research areas of the current project, the project period was short. The recent tri-semester system has even made this difficult for the project members to complete the project in time.
- Covering some of the limitations, a follow-up project can be conducted to get more insights from the scientific publication of Dhaka University.

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