

*Full Length Research*

# **Bibliometric Analysis of Theses and Dissertations of Faculties of Physical and Life Sciences, Modibbo Adama University, Yola, Nigeria, 2001-2021**

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The study focuses on the analysis of theses and dissertations of the faculties of physical and life sciences of Modibbo Adama University, Yola during the period of 21 years of running its postgraduate programme (2001-2021). The theses and dissertations were obtained from the postgraduate faculty of the university. Every graduated postgraduate degree has a copy of its theses/dissertation deposited and they were used to retrieve bibliographic data for the study. The study covers 812 theses and dissertations (609 for physical sciences and 203 for life sciences) produced in the faculties within the period of the study. The study examined and analyzed the theses and dissertations such as types of postgraduate research output produced by each of the faculties, the growth rate of the research output of each of the faculties, annual growth rate of the research output of each of the faculties, cumulative annual growth rate of the research output of each of the faculties, and determining the top three ranked academics in each of the faculties in terms of postgraduate supervision and graduation.

**Keywords:** Modibbo Adama University, Bibliometric, Theses and Dissertations, Annual Growth Rate (AGR), Compound Growth Rate (CAGR), Most Prolific Academics

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## **INTRODUCTION**

Alan Pritchard is said to be the first person to use the term Bibliometrics. It is the application of mathematical methods in analyzing books and other documents. In its 27 years of establishment, the university under study transformed from Modibbo Adama College of University of Maiduguri (MACUM), to Federal University of Technology, Yola (FUTY), to Modibbo Adama University of Technology, Yola (MAUTech), and presently Modibbo Adama University, Yola (MAU).

Modibbo Adama University: Modibbo Adama University, Yola formally known Federal University of Technology, Yola, Adamawa state Nigeria was established in 1981 by the Federal Government of Nigeria to provide the much needed technologically skilled manpower for the nation. It is one of the Federal Universities recognized by National Universities Commission (NUC) to offer Bachelor's, Master's and Doctorate degrees in different fields of Science and Technology.

The University's first set of 108 students graduated in the 1988/89 academics session. The University was merged to University of Maiduguri in the 1984, when it became the Modibbo Adama Campus (MACUM), of University of Maiduguri. However, in 1988, it was de-merged and granted full autonomy with the name reverted to Federal University of Technology, Yola. In 2011, the then President and Commander in-Chief, Dr. Goodluck Ebele Jonathan, GCFR approved the change of the University's name to Modibbo Adama University of Technology, (MAUTECH) Yola, effective from 1st October 2011.

With students' population of over twenty thousand, the University runs undergraduate and postgraduate programs in seven schools namely: School of Agriculture and Agricultural Technology (SAAT); School of Environmental Science (SES); School of Management and Information Technology (SMIT); School of Pure and Applied Sciences (SPAS); School of Engineering and Engineering Technology (SEET); School of Technology and Science Education (STSE) and School of Postgraduates Studies (SPGS).

## Literature Review

Hadimani et al (2015) in their study of bibliometric analysis of research publications of Indian institute of science education and research, Thiruvananthapuram found out that the institute published 157 research papers in different disciplines of science and technology during 2008-2013. Their study found that 157 papers were totally cited 2133 times, with average citation per paper at 13.58, the study also found out that annual average growth rate was 111%, with highest number of papers published in 2013 (52 papers at 33.12%). The most favored journal of publication by the institute is found to be "Journal of Physical Chemistry C", which has 11 articles (7.01%) and ranked first. 2,717 authors have contributed 157 publications with an average contribution of authors per paper at 17.31 and 0.06 productivity per author. Datta, A. with 33 (21.02%) contribution was ranked first in the study. All the principal authors were from India with co-authors from the USA (28 at 17.83%), Germany (20 at 12.74%) and England (16 articles at 10.19%)

Prabhoi et al (2019) studied library and Information Science research in East and North East India. They found that 32 LIS faculty and Authors contributed 967 papers from 1980 – 2017. 452 publications are journal articles. The study also found that most of the papers were published in conference in PLANNER 54 publications, CALIBER 44 publications and IASLIC conference 17 publications. The Study also found that very few faculties used Google Scholar IDs.

Shukla et al (2019) in their study of mapping the research publications pattern of faculties of library and Information Science department, Mizoram University, Aizawl from 2008 – 2017: A Bibliometric study, analyzed 279 publications of which 119 of the publications were journal articles. The study found out that the maximum number 61 (21.86%) of research papers were published in 2017. The study also found that there is no constant growth of publications every year during the period of the study and the highest growth rate was 366.67 in the year 2010. The study also found that the yearly output is increasing annually, but the compound annual growth rate is in fluctuation trend. On most prolific author, the study found that Dr. Manoj Kumar Verma is the most productive author and ranked first with 90 (32.26%) publications.

## Objectives of the Study

The objectives of the study are:

1. Find out the type of theses and dissertations produced in each of the two faculties of the university
2. Determine the growth of the theses and dissertations produced in each of the two faculties of the university
3. Find out the annual growth rate of the theses and dissertations produced in each of the two faculties of the university
4. Determine the compound annual growth rate of the theses and dissertations produced in each of the two faculties of the university
5. Determine the most prolific postgraduate supervisor in each of the two faculties of the university

## Scope of the study

The scope of the study is restricted to only postgraduate theses and dissertations produced in the two faculties of the university since 2001-2021.

## METHODOLOGY

This is a Bibliometric analysis of theses and dissertations produced in the faculties of physical and life sciences of MAU, Yola. Survey and observation method were used. The data were retrieved from 812 theses and dissertations available at the postgraduate faculty of the university. This is because the theses and dissertations of the University are not available online. The data collected were manually analyzed and presented in form of tables. Annual Growth Rate (AGR) and Compound Annual Growth Rate (CAGR) were analyzed using following the formulae;

$$AGR = \frac{\text{Ending Value}}{\text{Beginning Value}} - 1 \times 100, CAGR = \left( \frac{\text{Ending Value}}{\text{Beginning Value}} \right)^{1/n} - 1 \times 100$$

Weighting system (PhD = 5 points, MSc/MTech = 3 points, MBA/MPA = 2 points and PGD/PGDE = 1 point) was used to determine the ranking of the most prolific academic staff in postgraduate supervision in each of the faculties.

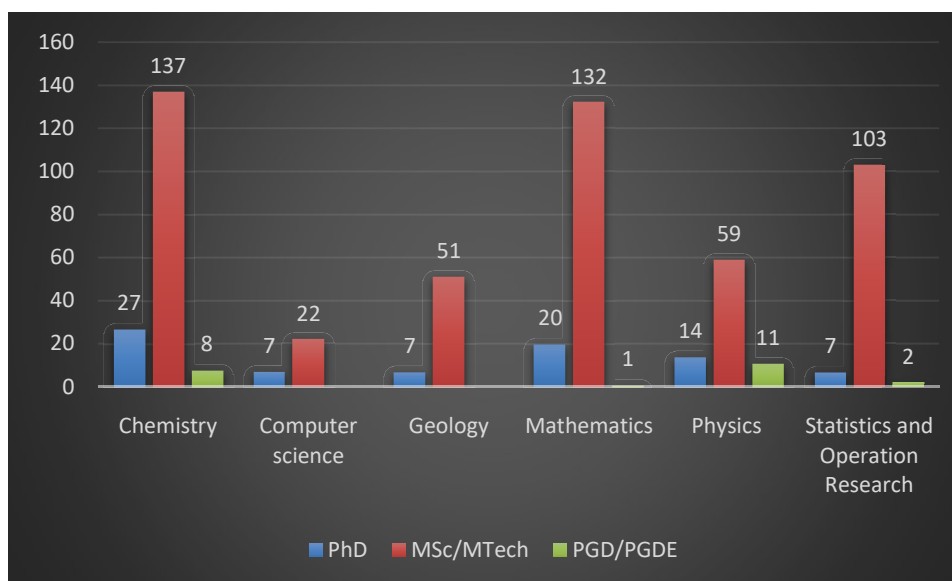
## Data Analysis

### Types of theses and dissertations produced in each of the two faculties of the university.

The type of theses and dissertations produced in each of the two faculties of the university are presented in table 1a, 1b and figure 1a, 1b below.

**Table 1a:** Types of theses and dissertations produced in the Faculty of Physical Sciences

Department	PhD	%	MSc/MTech	%	PGD/PGDE	%	Total
Chemistry	27	15.7	137	79.7	8	4.7	172
Computer science	7	24.1	22	72.4			29
Geology	7	12.1	51	87.9			58
Mathematics	20	13.1	132	86.3	1	0.7	153
Physics	14	16.7	59	70.2	11	13.1	84
Statistics and Operation Research	7	6.3	103	91.9	2	1.9	112
<b>Total</b>	<b>82</b>	<b>13.5</b>	<b>504</b>	<b>82.9</b>	<b>22</b>	<b>3.6</b>	<b>608</b>

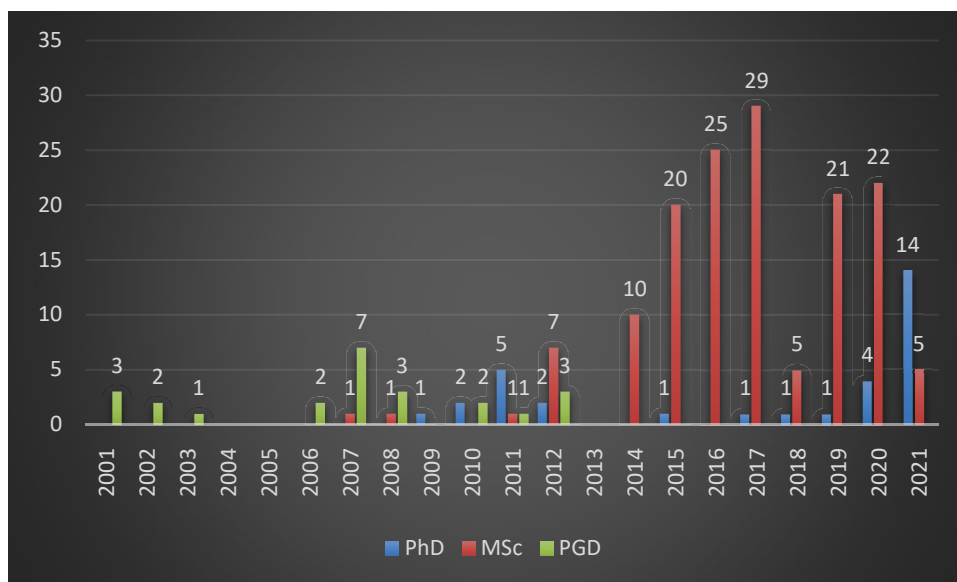


**Figure 1a.** Types of theses and dissertations produced in the Faculty of Physical Sciences

Table 1a and figure 1a above show that a total of 608 theses and dissertations were produced in the faculty of physical sciences since the inception of its postgraduate programmes. Master Degree (MSc/MTech) has a total of 504 (82.9%), followed by Doctor of Philosophy with 82 (13.5%) and Postgraduate Diploma with 22 (3.6%)

**Table 1b:** Types of theses and dissertations produced in the Faculty of Life Sciences

Year	PhD	MSc	PGD	Total
2001			3	3
2002			2	2
2003			1	1
2004				
2005				
2006			2	2
2007		1	7	8
2008		1	3	4
2009	1			1
2010	2		2	4
2011	5	1	1	7
2012	2	7	3	12
2013				
2014		10		10
2015	1	20		21
2016		25		25
2017	1	29		30
2018	1	5		6
2019	1	21		22
2020	4	22		26
2021	14	5		19
<b>Total</b>	<b>32 (15.8%)</b>	<b>147 (72.4%)</b>	<b>24 (11.8%)</b>	<b>203</b>

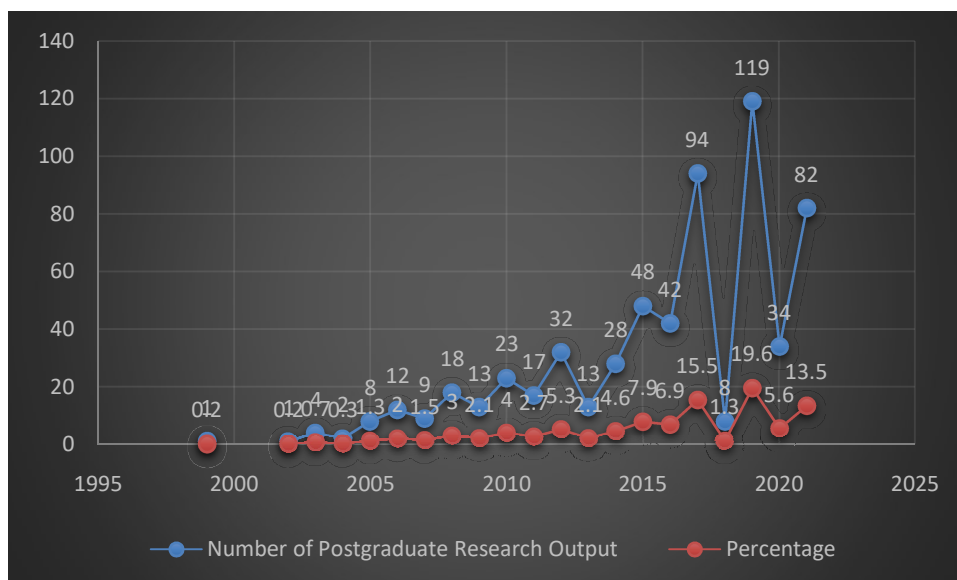


**Figure 1b;** Types of theses and dissertations produced in the Faculty of Life Sciences

Table 1b and figure 1b above show that a total of 203 theses and dissertations were produced in the faculty of life sciences since the inception of its postgraduate programmes. Master Degree (MSc/MTech) has a total of 147(72.4%), followed by Doctor of Philosophy with 32 (15.8%) and Postgraduate Diploma with 24 (11.8%).

**Table 2a:** Growth of theses and dissertations produced in the Faculty of Physical Sciences

Year	Number of Postgraduate Research Output	Percentage
1999	1	0.2
2000		
2001		
2002	1	0.2
2003	4	0.7
2004	2	0.3
2005	8	1.3
2006	12	2.0
2007	9	1.5
2008	18	3.0
2009	13	2.1
2010	23	4.0
2011	17	2.7
2012	32	5.3
2013	13	2.1
2014	28	4.6
2015	48	7.9
2016	42	6.9
2017	94	15.5
2018	8	1.3
2019	119	19.6
2020	34	5.6
2021	82	13.5
<b>Total</b>	<b>608</b>	

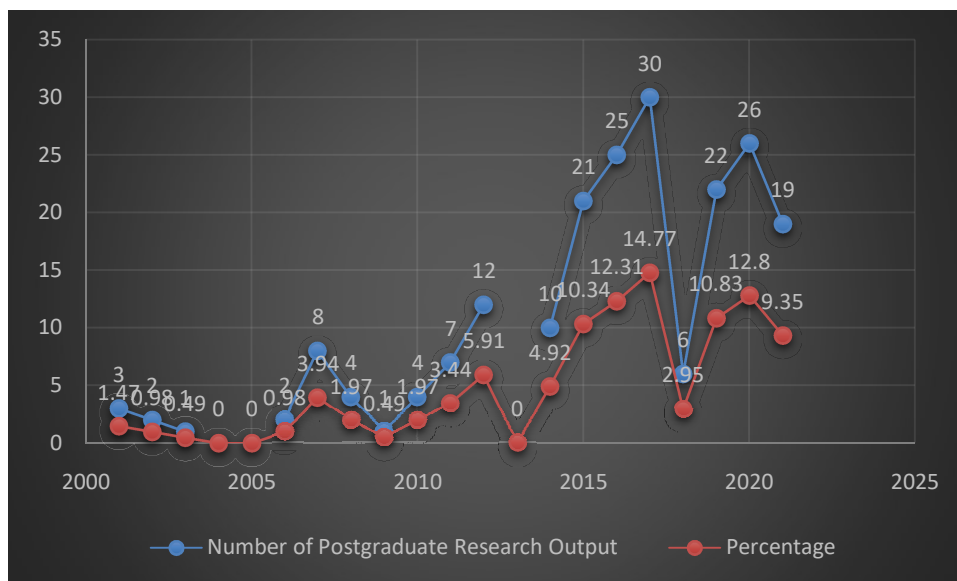


**Figure 2a;** Growth of theses and dissertations produced in the Faculty of Physical Sciences

Table 2a and figure 2a above show the growth of the theses and dissertations of the faculty of physical sciences for the 21 years of its postgraduate program. The year with highest number of theses and Dissertations is 2019 with 19.6%. This is followed by 2017 (15.5%), 2021 (13.5%). Other years recorded very low percentages.

**Table 2b:** Growth of theses and dissertations produced in the Faculty of Life Sciences

Year	Number of Postgraduate Research Output	Percentage
2001	3	1.47
2002	2	0.98
2003	1	0.49
2004		-
2005		-
2006	2	0.98
2007	8	3.94
2008	4	1.97
2009	1	0.49
2010	4	1.97
2011	7	3.44
2012	12	5.91
2013		-
2014	10	4.92
2015	21	10.34
2016	25	12.31
2017	30	14.77
2018	6	2.95
2019	22	10.83
2020	26	12.80
2021	19	9.35
<b>Total</b>	<b>203</b>	

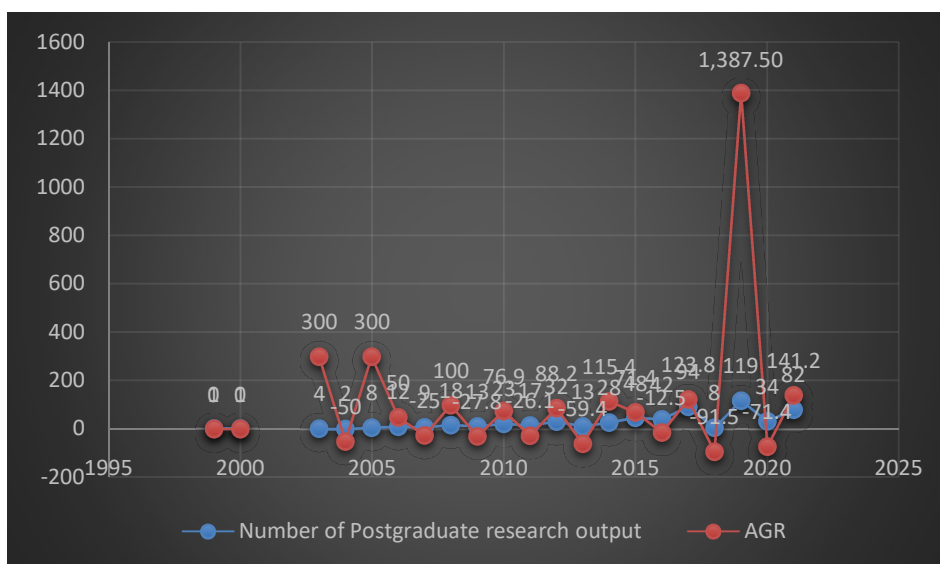


**Figure 2b:** Growth of theses and dissertations produced in the Faculty of Life Sciences

Table 2b and figure 2b above show the growth of the theses and dissertations of the faculty of life sciences for the 21 years of its postgraduate program. The year with highest number of theses and Dissertations is 2017 with 14.7%. This is followed by 2020 (12.8%), 2016 (12.3%). 2019 (10.8%), 2015 (10.3%). Other years recorded single digit percentages.

**Table 3a:** Annual growth rate of the theses and dissertations produced in the faculty of Physical Sciences

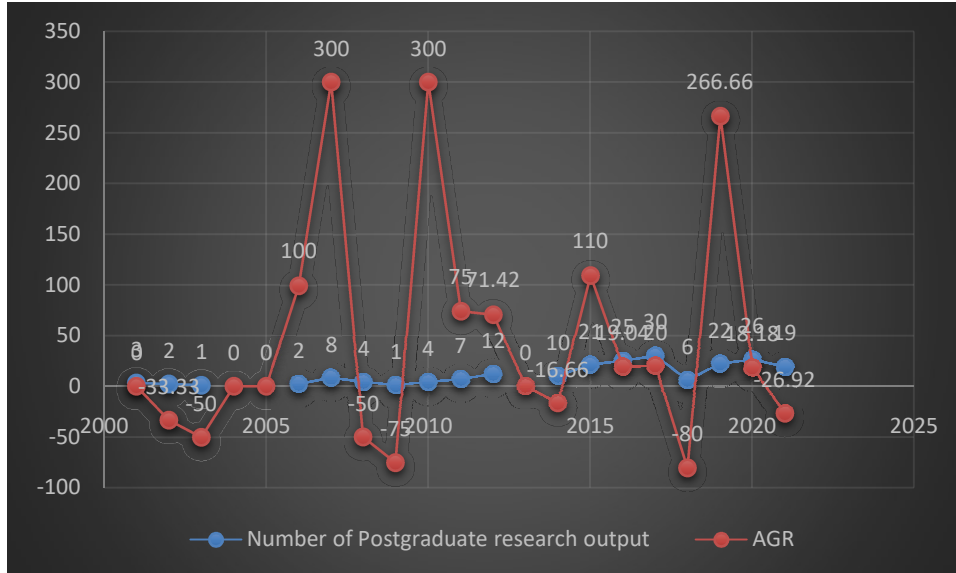
Year	Number of Postgraduate research output	AGR
1999	1	0
2000	1	0
2001		
2002		
2003	4	300
2004	2	-50
2005	8	300
2006	12	50
2007	9	-25
2008	18	100
2009	13	-27.8
2010	23	76.9
2011	17	-26.1
2012	32	88.2
2013	13	-59.4
2014	28	115.4
2015	48	71.4
2016	42	-12.5
2017	94	123.8
2018	8	-91.5
2019	119	1,387.5
2020	34	-71.4
2021	82	141.2

**Figure 3a:** Annual growth rate of the theses and dissertations produced in the faculty of Physical Sciences

From table 3a and figure 3a above, it can be deduced that the Annual Growth Rate is fluctuating. The growth is not normal. Year 2019 recorded the highest AGR of 1387.5, followed by 2003 and 2005 with 300 AGR each. 2021 with 141.2, 2017 with 123.8, 2014 with 115.4 and 2008 with 100 AGR. Other years recorded less than 100 AGR with others in negative values.

**Table 3b:** Annual growth rate of theses and dissertations produced in the faculty of Life Sciences

Year	Number of Postgraduate research output	AGR
2001	3	0
2002	2	-33.33
2003	1	-50
2004		-
2005		-
2006	2	100
2007	8	300
2008	4	-50
2009	1	-75
2010	4	300
2011	7	75
2012	12	71.42
2013		-
2014	10	-16.66
2015	21	110
2016	25	19.04
2017	30	20
2018	6	-80
2019	22	266.66
2020	26	18.18
2021	19	-26.92



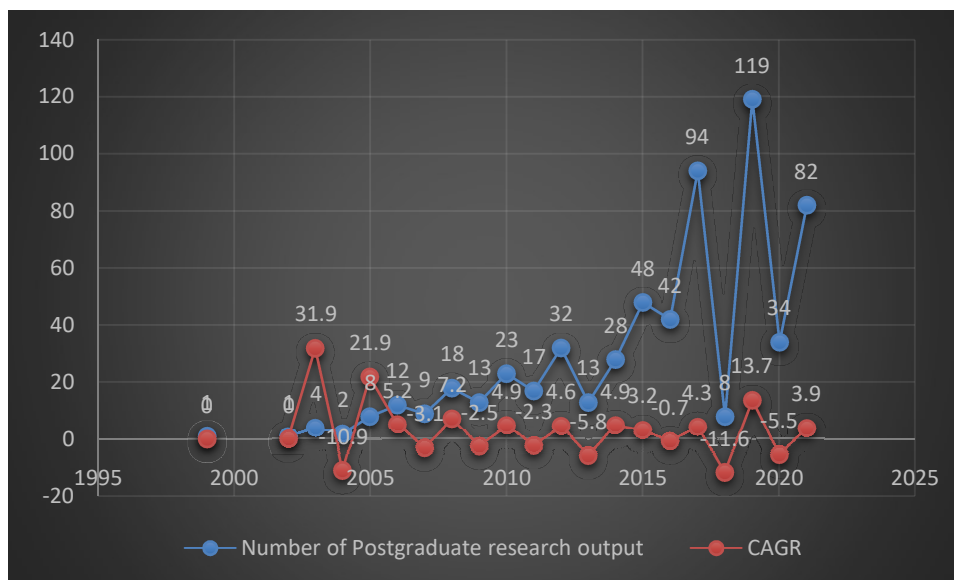
**Figure 3b:** Annual growth rate of theses and dissertations produced in the faculty of Life Sciences

From table 3b and figure 3b above, it can be deduced that the Annual Growth Rate is fluctuating. The growth is not normal. Year 2007 and 2010 recorded the highest AGR of 300 each. This is followed by 2019 with 266.6 AGR. 2015 has 110 and 2006 has 100 AGR each. Other years recorded less than 100 AGR with others in negative values.



**Table 4a:** Compound Annual Growth Rate of the theses and dissertations produced in the Faculty of Physical Sciences

Year	Number of Postgraduate research output	Cumulative Frequency	CAGR
1999	1	1	0
2000			
2001			
2002	1	2	0
2003	4	6	31.9
2004	2	8	-10.9
2005	8	16	21.9
2006	12	28	5.2
2007	9	37	-3.1
2008	18	55	7.2
2009	13	68	-2.5
2010	23	91	4.9
2011	17	108	-2.3
2012	32	140	4.6
2013	13	153	-5.8
2014	28	181	4.9
2015	48	229	3.2
2016	42	271	-0.7
2017	94	365	4.3
2018	8	373	-11.6
2019	119	492	13.7
2020	34	526	-5.5
2021	82	608	3.9

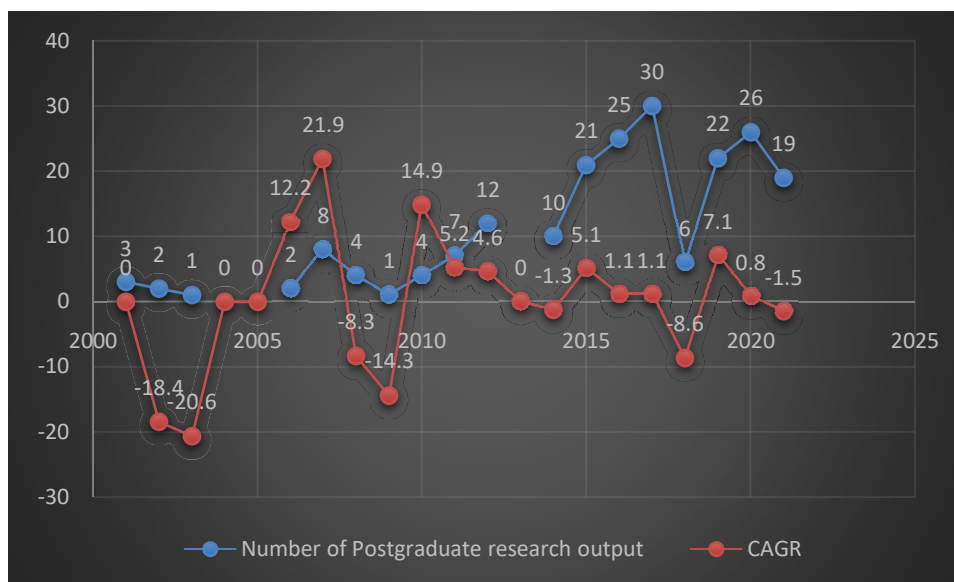


**Figure 4a:** Compound Annual Growth Rate of the theses and dissertations produced in the Faculty of Physical Sciences

Table 4a and figure 4a above reveal that the Compound Annual Growth Rate is also fluctuating just as the Annual Growth Rate. Year 2003 recorded the highest CAGR with 31.9, followed by 2005 with 21.9 CAGR and 2019 with 13.7 CAGR. Other years recorded low CAGR with others in negative values.

**Table 4b:** Compound Annual Growth Rate of the theses and dissertations produced in the Faculty of Life Sciences

Year	Number of Postgraduate research output	Cumulative Frequency	CAGR
2001	3	3	0
2002	2	5	-18.4
2003	1	6	-20.6
2004		-	-
2005		-	-
2006	2	8	12.2
2007	8	16	21.9
2008	4	20	-8.3
2009	1	21	-14.3
2010	4	25	14.9
2011	7	32	5.2
2012	12	44	4.6
2013		-	-
2014	10	54	-1.3
2015	21	75	5.1
2016	25	100	1.1
2017	30	130	1.1
2018	6	136	-8.6
2019	22	158	7.1
2020	26	184	0.8
2021	19	203	-1.5

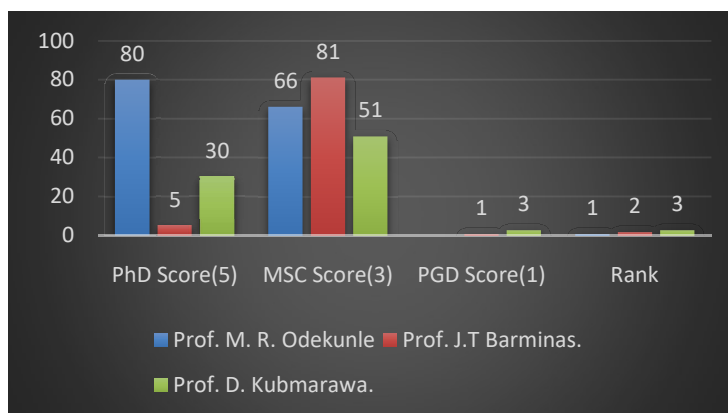


**Figure 4b:** Compound Annual Growth Rate of the theses and dissertations produced in the Faculty of Life Sciences

Table 4b and figure 4b above reveal that the Compound Annual Growth Rate is also fluctuating just as the Annual Growth Rate. Year 2007 recorded the highest CAGR with 21.9, followed by 2010 with 14.9 CAGR and 2006 with 12.2 CAGR. Other years recorded single digit CAGR with others in negative values.

**Table 5a:** Faculty Ranking of the Most Prolific Academic Staff in Postgraduate Supervision and Graduation in Faculty of Physical Sciences

S/N	NAME	PhD	Score (5)	MSC	Score (3)	PGD	Score (1)	Total	Rank
1.	Prof. M. R. Odekunle	16	80	22	66			146	1
2.	Prof. J.T Barminas.	1	5	27	81	1	1	87	2
3.	Prof. D. Kubmarawa.	6	30	17	51	3	3	84	3

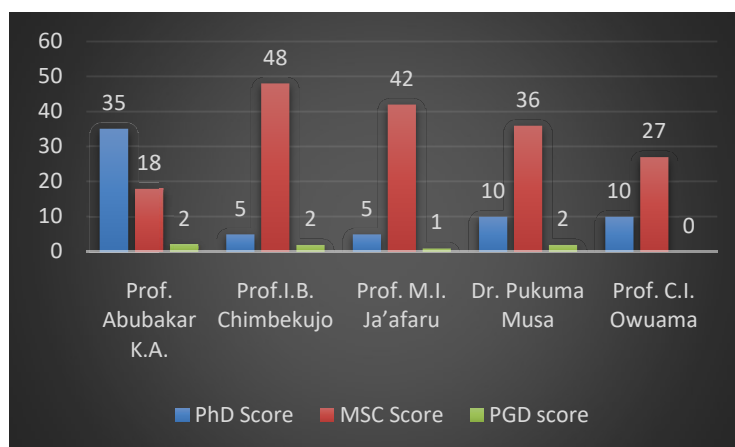


**Figure 5a:** Faculty Ranking of the Most Prolific Academic Staff in Postgraduate Supervision and Graduation in Faculty of Physical Sciences

From table 5a and figure 5a above, it clearly shows that Professor M.R. Odekunle is the most prolific postgraduate supervisor in the faculty and is ranked first with 146 points, followed by Prof. J. T. Barminas ranked second with 87 points, while Prof. D. Kubmarawa is ranked third with 84 points.

**Table 5b:** Ranking of the academic staff on the basis of postgraduate supervision and graduation in the Faculty of Life Sciences

S/N	NAME	PhD	Score	MSC	Score	PGD	score	Total	Ranking
1.	Prof. Abubakar K.A.	7	35	6	18	2	2	55	1
2.	Prof.I.B. Chimbekujo	1	5	16	48	2	2	55	1
3.	Prof. M.I. Ja'afaru	1	5	14	42	1	1	48	2
4.	Dr. Pukuma Musa	2	10	12	36	2	2	48	2
5.	Prof. C.I. Owuama	2	10	9	27	0	0	37	3



**Figure 5b:** Ranking of the academic staff on the basis of postgraduate supervision and graduation in the Faculty of Life Sciences

From table 5b and figure 5b above, it shows that Professor Abubakar K. A. and Prof. I. B. Chimbekujo are the most prolific postgraduate supervisors in the faculty and are ranked first with 55 points each. Prof. M. I. Ja'afaru and Dr. Pukuma Musa are ranked second with 48 points each, while Prof. C. I. Owuama is ranked third with 37 points.

## CONCLUSION

From this bibliometric analysis of theses and dissertations of faculties of physical and life sciences, Modibbo Adama University, Yola, Nigeria, from 2001 to 2021, 812 total of theses and dissertations were examined and analyzed. 651(80.2%) of the 812 are all master degree theses. Although the growth of the theses and dissertations are generally increasing, the annual growth rate and compound annual growth rate are in fluctuating trends.

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