Volume - 5 (2025)
Issue - 1 (December)
LIBRARY SCHOLAR
International Peer-Reviewed Journal of Library Science
ISSN 2583-2549

DOCTORAL THESES OF CHEMICAL ENGINEERING ACCEPTED BY ANDHRA UNIVERSITY DURING 1942-2023: A BIBLIOMETRIC STUDY

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Abstract : The present paper analyzed 253 Ph.D. Theses accepted by Andhra University, Visakhapatnam Andhra Pradesh during 1942-2023. which .The study found that male scholars produced 197 theses constituting more than three- fourth (77.86 %) of all Doctoral theses and female scholars produced 56 (22.14%) theses in different sub- disciplines of Chemical Engineering. Chronological growth of data indicates that the pattern of theses accepted followed an inconsistent trend during the study period. Highest number (84) theses were accepted in the ten year block of 2012- 2021, constituting about 33 % of the total accepted theses. Most of the theses were awarded under the supervision of male supervisors. Of the 253 theses, 197 (77.86 %) students were supervised by male super visors and the remaining 22.14 % theses were submitted under the supervision of female supervisors. Of the 4 prolific supervisors who supervised 10 or more scholars.

Keyword : Chemical Engineering, Ph.D. Theses, Andhra University, Bibliometric Analysis.

Introduction:

Research forms the bedrock for any future endeavors or investigation in any field of knowledge. In the realm of academia and research, institutions wield significant influence in modelling scholars within their respective fields. Governments worldwide are directing their substantial investments into research and development facilities, recognizing their role in providing large number of resources. Dissertations and theses, which emanate from various universities and research institutions, form an integral part of the research process and serve as a medium for disseminating research findings. Doctoral theses, in addition to scholarly journal publications, are pivotal in gauging the effectiveness of a university or research laboratory in a particular investigative field. The caliber of research in a thesis or dissertation varies based on the country, university, or program. Earning a Ph.D. necessitates the demonstration of expertise in a given subject. A well-crafted thesis is characterized by specificity and focus, offering

readers a clear roadmap through the presented work while avoiding vague language and pre-empting and addressing potential counter-arguments.

Chemical Engineering in Andhra Pradesh :

Chemical engineering is a well-regarded field in Andhra Pradesh, with four institutions offering Ph.D. programs. Andhra University, Visakhapatnam, Sri Venkateswara University,Tirupati, Jawaharlaa Nehru Technological University, Anantapuram (JNTUA) and Jawaharlaa Nehru Technological University, Kakinada{JNTUK).

About Andhra University (AU) :

Andhra University, located in Visakhapatnam, is one of the oldest and most prestigious institutions in Andhra Pradesh. Here's an overview of the chemical engineering programs and related aspects at Andhra University.

Literature Survey :

The field of bibliometrics is currently expanding quickly, with notable advancements being made in the area of citation analysis. Numerous books and review articles about the evolution of bibliometrics have been published. Bibliometric analysis has become a more popular tool for evaluating scientists' research output and the progress of different scientific fields.

Subbarayudu and Surendra Babu's (2014) study looked at 7,444 citations from 43 PhD theses at the University of Hyderabad that were completed between 1986 and 2012. 80.62% of the citations were found to be from books, 53.16% had to do with geographic distribution, and 92.60% had to do with language distribution, according to the study. The majority of research scholars in the philosophy department used books more frequently than other sources for their research studies, according to the data collection and analysis.

The first analysis of bibliometric empirical laws was written by Fairthorne (1969), and Hjerppe (1980) published a major review with more than 200 items on bibliometrics. Hertzel (1987) carried out the most thorough historical analysis, which was then included in the "Encyclopaedia of Library and Information Science." Sen and Kumar (1986) conducted a review of the bibliometric literature and found that the first publication in bibliometrics from India came from INSDOC, where an article on the citation practices of 200 science and technology journals in India and abroad was published.

Garg and Saini (2015) carried out a bibliometric assessment of 1763 doctoral and postgraduate theses that were authorized by Raipur, Chhattisgarh's Indira Gandhi Agricultural University.
Additionally, 44 Ph.D. theses in sociology that were published between 2000 and 2006 were examined by Singh and Kumar (2016). Based on the authorship pattern, 1842 authors

were involved in these theses. Of the 44 sociology Ph.D. theses, 1617 had a single author, 210 had a joint author, and 15 had more than two authors.

Objectives of the Study :

1. Analyzing the sequential growth of theses approved by Andhra University from 1942 to 2023 in blocks of ten years each.
2. Reviewing the theses submitted by male and female scholars from 1942 to 2023 in blocks of ten years each.
3. Identifying the gender of the supervisors and determining the most prolific male and female supervisors.

Methodology :

The current study's methodology is based on 253 doctoral dissertations that were turned in between 1942 and 2023 to Andhra University in Visakhapatnam, Andhra Pradesh. Using Microsoft Excel, the data is gathered, arranged, and examined using tables and graphs.

Data Analysis and Interpretation :

1. Theses are distributed based on the single and double guides :

Of the 253 theses submitted, 215 (84.98%) were submitted under the supervision of a single supervisor, and 38 (15.02%) were submitted under the supervision of two supervisors, per the data shown in Table 1.

Table 1. Theses are distributed based on the single and double guides

S.No	Guide	No.of Theses	% of Theses
1	Single Supervisor	215	84.98
2	Double Supervisor	38	15.02
		253	100

2. Chronological Distribution of Theses :

Table 2 shows the acceptance of theses by Andhra Pradesh Universities from 1942 to 2023 in chronological order. To calculate the number of male and female scholars in each 10-year period, we will group the scholars by decade during data analysis. We will be looking at data from the last eight decades plus two years. In the field of chemical engineering, 253 Ph.D. theses were approved during the study period. The maximum number of theses 84 (33.20%) that can be submitted during the 2012–2021 period is done so. The minimum amount of theses 3 (1.18%) submitted during the 1942–1951 period.

Table 2. Chronological Distribution of Theses

Theses Distributed for every 10 years				
SNo	Year	Male	Female	Total
1	1942-1951	3	0	3
2	1952-1961	6	0	6
3	1962-1971	19	1	20
4	1972-1981	34	1	35
5	1982-1991	13	5	18
6	1992-2001	16	5	21
7	2002-2011	46	12	58
8	2012-2021	55	29	84
9	2021-2023	5	3	8
Total		197	56	253

3. Productivity of Male and Female Scholars :

Table 3 shows that of the 253 theses submitted, 197 (77.86%) were accepted by male scholars, and 56 (22.14%) by female scholars.

Table 3. Productivity of Male and Female Scholars

S.No	Gender	Scholars	%	Supervisors	%
1	Male	197	77.86	232	91.70
2	Female	56	22.14	21	8.30
Total		253	100	253	100

4. **Distribution of Supervisors** :

Table 4: Definitions A total of 129 supervisors oversaw the acceptance of 253 theses throughout the study period. Nine of these supervisors were female, and 120 of them were male. Table 4 presents the results, which show that out of the 253 theses, 232 (91.69%) were supervised by male supervisors, while the remaining 21 (8.30%) were submitted with guidance from female supervisors.

Table 4. Distribution of Supervisors

S.No	Thesis under the Male & Female Supervisors							Total
	Year	Male Supervisors	Student Guided	%	Female Supervisors	Student Guided	%	
1	1942-51	2	3	1.5	0	0	0	3
2	1952-61	5	6	1.2	0	0	0	6
3	1962-71	10	14	1.4	0	0	0	14

4	1972-81	15	32	2.1	0	0	0	32
5	1982-91	12	16	1.3	0	0	0	16
6	1992-01	11	18	1.6	0	0	0	18
7	2002-11	29	48	1.6	2	5	2.5	53
8	2012-21	31	90	2.9	6	14	2.3	104
9	2021-23	5	5	1	1	2	2	7
Total		120	232		9	21		253

5. Supervisor distribution based on the number of students supervised :

According to Table 4, 253 research scholars were supervised by 129 supervisors. Table 5 shows that 208 supervisors (82%) supervised two or more scholars, while 45 supervisors (18%) guided just one scholar.

Table 5. Supervisor distribution based on the number of students supervised

S.No	No.of Students guided by the Supervisors	No.of Supervisors	Total
1	1 Student	45*1	45
2	2 Students	13*2	26
3	3 Students	9*3	27
4	4 Students	6*4	24
5	5 Students	5*5	25
6	6 Students	6*6	36
7	7 Students	1*7	7
8	8 Students	0*8	0
9	9 Students	2*9	18
10	10 Students	1*10	10
11	11 Students	1*11	11
12	12 Students	2*12	24
Total			253

6. Most Prolific Supervisors :

Table 6 lists the five supervisors who provided guidance to nine additional scholars in various Chemical Engineering areas. Prof. King Pulipati's maximum number of scholars (12). Prof. Rajendra Prasad P. oversees 12 scholars after this.

Table 6. Most Prolific Supervisors

S.No	Name of Guide	No.of Students Guided	Gender
1	King,Pulipati.	12	M
2	Rajendra Prasad,P.	12	M
3	Srirami Reddy, D.	11	M
4	Raju, CHAI	10	M
5	Ramachandra Row, L.	9	M

Findings :

- Of the 253 theses that were approved, 215 had a single supervisor, and the other 38 had two supervisors.
- A total of 253 theses were approved, with 197 coming from male and 56 from female scholars.
- 129 supervisors, who were in charge of 253 scholars, were made up of 120 men and 9women. This implies that male supervisors oversaw the majority of theses.

Conclusion :

Abundant studies, including the current review, have consistently found a significant gender imbalance in academia, with male scholars vastly outnumbering their female scholars. The survey of academic writing revealed a clear disparity, with a higher proportion of male scholars compared to female scholars. These findings may motivate female researchers in Chemical Engineering to pursue doctoral degrees. Additionally, the faculty should actively encourage more female researchers to undertake Ph.D. programs.

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