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## Research Excellence of Newly Recruited Faculty at Haryana Agricultural University

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### Abstract

As research is ensconced with teaching at university level, this article engages with the research output of newly recruited faculty members at Haryana Agricultural University (HAU), Hisar (India). New faculty members were administered questionnaires during *Orientation Program* in 2019 at HAU. Aspects like total number of publications, documents in which published, authorship pattern etc. are presented in this article. In addition to these, sex and age group wise hypotheses also tested (with parametric tests). Attempt is also made to assess faculty satisfaction with publishing concerns (on a ten point scale with fifteen items). The new faculty showed magnificent research excellence with a total output nearing five hundred articles and many of these were indexed in reputed databases, including Thomson Reuters. Solo publications were quite less for journal articles but a little more than half had published as first author. Significant differences (with t-test and ANOVA) were not supported for null hypotheses. Publishing activity for writing reviews was less, especially books. Since literature on research output of newly recruited agricultural university faculty is scant, findings of this study may illuminate us in gaining an insight to this discipline.

*Keywords:* Agricultural University; Higher Education; India; New Faculty; Research Output; Research Productivity

### Introduction

Research inherently is an enduring process. It's not a sporadic activity for faculty members in a university. Although enormous research productivity is taking place in universities the world over, including India, however, university environment poses immense challenges to newly recruited faculty.

In every academic institution research performance of its scholar community including teachers and students is an essential criteria for academic achievements of institution as well as individual. Research performance of an institution or any nation indicates the level of its progress towards research and development likewise a nation. Research performance depends on mainly two indicators- 1) Research productivity and 2) Impact. First is measured by the total number of research output in a definite period while second is measured by the citations received to that output in the same period. A number of agencies and companies provide research funding to the academic institutions for research purposes only after evaluating their research performance. The academic rankings to the Institutions are also provided on the basis of research performance indicators decided by various government agencies and organizations at national and international level. On the other side, in almost all the academic units, research performance of an individual is considered as the most important criteria for recruitment, promotion, recognitions, funding, facilities, etc.

Within the learning community, we have witnessed explosions in the information and communication technologies (ICTs) and experienced ourselves that the process of research is also transforming in many disciplines. Along with it we are adapting to the changing paradigm of scholarly communication over the past several decades. No matter whatever is the area of investigation, academic research can never be cloaked in obscurity in today's times. However, dissemination of research is easy than creation.

The process of interaction between academic research and teaching is varied and complex. Apart from time management (with self, family, workplace etc.), there could be innumerable aspects associated with conducting research as far as human mind can get. Academic research also involves possession of various skills like ICT, technical writing, expiscatory competence etc. among faculty in higher educational institutions (HEIs). In addition to these, being a new university teacher supplements a set of problems of its own kind. As noted by Adams<sup>1</sup> "new faculty consistently report being overwhelmed by the variety of demands placed on them".

Since research is ensconced with teaching at university level, the researchers felt it imperative to investigate research excellence of newly recruited faculty members at Haryana Agricultural University (HAU), Hisar.

### **A Glance at Related Research**

Across the academic community, the borderline between teaching and research can never be marked for teachers in higher educational institutions. There are both pros and cons for faculty research (Prince et al.<sup>2</sup>) in the light of teaching enhancement, especially at the undergraduate level. In Shortlidge et al.<sup>3</sup> study 76 percent faculty members opinioned that it helps to integrate teaching and research and 61 percent teachers also felt that it increases publications. To prepare lifelong researchers, the value of research can be instilled in students by integrating teaching and research (Burke and Rau<sup>4</sup>).

About three decades back Turner and Boice<sup>5</sup> found that 85 percent newly recruited university faculty had work related stress. During their first year in teaching, actual time spent on research was less than 15 percent, which was much below to their aspirations. They also hoped to write at least one paper while completing their first teaching year but modal value was found zero for finished papers. However, new lecturers' performance was at par (with new tenure track faculty) for giving paper presentations and submitting articles for publication.

As Boice<sup>6</sup> signified problems of released-time, it was found that meeting research obligations by new lecturers (without released-time) were as productive as new tenure-track faculty (with released-time of one course reduction). Women and minorities entering as new faculty could have their own set of problems and reflections. Boice<sup>7</sup> presented a detailed account of such experiences.

Williamson and Cable<sup>8</sup> found that management faculty's pre-appointment presentations and publications had a positive impact of similar research output during the first three years of teaching. However, it continued for four to six years for presentations but not for publications.

This study also supported that those working under the guidance of prolific research advisors increased new faculty's research productivity.

Yet, there are growing concerns that career stage is a critical element for new faculty (Ponjuan et al.<sup>9</sup>). And with declining budgets constantly, even performance based funding is called for (Cantrell<sup>10</sup>).

Only a few studies have examined research productivity in agricultural settings. Indian rice scientists had higher research output than their Sri Lankan counterparts (Wickremasinghe<sup>11</sup>).

Kotrlik et al.<sup>12</sup> identified three variables: doctoral students' supervision; research confidence; and number of graduate assistant hours allocated to agricultural faculty, which enhances research productivity.

Hilmer and Hilmer<sup>13</sup> dwelled upon student-advisor relations and early career research productivity for agricultural and resource economics Ph.D.s between the years 1987-2000. The study revealed that where advisors' had more relative research output, their students also exhibit greater research productivity in their early career.

Another indispensable consideration accompanying research productivity among university faculty is authorship pattern. It was observed that single authored publications are less in agriculture and allied disciplines. Sife et al.<sup>14</sup> reported that out of 1031 publications (during 1998 to 2013), there were just 123 (11.9 percent) single authored publications by forestry researchers at Sokoine University of Agriculture.

A study on agricultural economists found that top rated publications in the field had positive effect on income (Hilmer and Hilmer<sup>15</sup>) and sole authorship more advisable (than multi-authored papers).

Paul et al.<sup>16</sup> surveyed 200 agricultural scientists from Indian Agricultural Research Institute, New Delhi (high performing) and Chandra Shekhar Azad University of Agriculture and Technology, Kanpur (low performing). Using factor analysis on sixty variables, eleven factors were identified for research productivity. Organizational factors (with 38.46 percent variability – five factors) included organization research environment, research facility etc. and personal factors (contributing 46.85 percent variance) included creativity, perseverance and commitment etc. among six factors.

Hedjazi and Behravan<sup>17</sup> found that agriculture faculty research productivity had a significant relation with age and academic rank. They also identified factors affecting research as working habits, clear research objectives, communication with colleagues etc. among others.

Siwach and Parmar<sup>18</sup> examined the research output and citation impact of the scientists of Chaudhary Charan Singh Haryana Agricultural University Hisar during period of 2001-2015.

In a similar kind of study Parmar and Siwach<sup>19</sup> compared the research performance of Indian Council of Agricultural Research (ICARs) top ranked five Agricultural Universities during 2006 to 2015.

Studies related to scholarly activities of faculty members have been discussed above and surely there is much scope for further investigation, especially for new faculty in agricultural universities. Albeit a little bit attempt, it is hoped that this study would assist gaining an insight to understand newly recruited faculty members' research excellence.

### Design and Methods

Sample in this study is newly recruited faculty at Chaudhary Charan Singh Haryana Agricultural University, Hisar. Questionnaires were filled at an orientation programme organized during 2019. It is mandatory for every faculty recruited at university to attend this programme during probation period of two years. Thenceforth, faculty's maximum teaching experience was less than two years. A total number of thirty questionnaires were distributed out of which only 25 were received back. The twenty five faculty members comprised 13 male (52 percent) and 12 (48 percent) female. Apart from questions regarding publications in various documents, a ten point *Satisfaction Scale* (where 1 = Extremely Dissatisfied and 10 = Extremely Satisfied) was also used with fifteen items (developed by authors). Parametric tests (t-test and ANOVA both 2-tailed) were used to test null hypotheses at 95 percent confidence level. Age group and sex wise classification is provided in Table 1 which indicated that eleven (44 percent) out of twenty five teachers were in 30 to 35 age group.

**Table 1: Sex wise Age Group of Faculty**

<u>Age Group</u> (years)	<u>Sex</u>		<u>Total</u> Number (%age)
	<i>Male</i> Number (%age)	<i>Female</i> Number (%age)	
25 to 30	5 (38.5)	-	5 (20.0)
30 to 35	5 (38.5)	6 (50.0)	11 (44.0)
35 to 40	2 (15.4)	5 (41.7)	7 (28.0)
40 to 45	1 (7.7)	1 (8.3)	2 (8.0)
Total	13 (100.0)	12 (100.0)	25 (100.0)

### Objectives of this Study

This study was conducted with the following objectives:

- To find out research output (total number of publications) by new faculty;
- To identify authorship pattern of faculty; and
- To assess faculty members' satisfaction regarding publishing concerns.

### Hypotheses formulated for this Study

Six null hypotheses were formulated to be tested as follows:

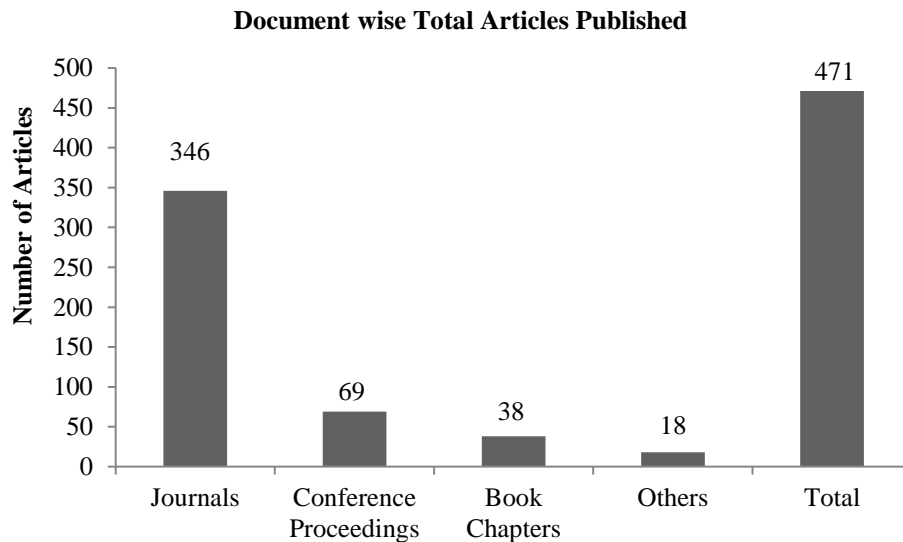
- H1 There is no difference between male and female faculty for total number of article publications;

- H2 There is no difference between different age groups of faculty for total number of article publications;
- H3 There is no difference between male and female faculty in first authorship for journal articles;
- H4 There is no difference between different age groups of faculty in first authorship for journal articles;
- H5 There is no difference between male and female faculty for *Satisfaction Scale*; and
- H6 There is no difference between different age groups of faculty for *Satisfaction Scale*.

**Data Analysis and Interpretation**

Being new faculty, number of books and reviews were somehow less. Hence, initially we provide separate information for articles published. Figure 1 indicates that a total number of 471 articles were published by the faculty members in various documents. Out of these maximum numbers of articles were in journals (346 papers).

**Figure 1: Number of Total Articles Published by Faculty**



**Figure 2: Total Articles Published as per Sex and Age Group**

**Sex and Age Group wise Total Articles Published**

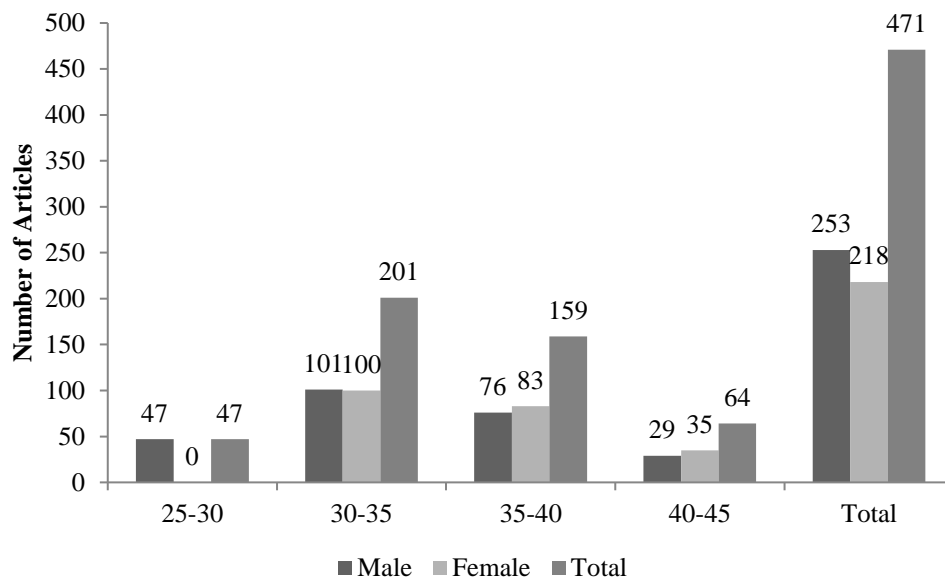


Figure 2 depicts sex and age group wise total number of articles published. It identified that male faculty published 253 papers while female faculty had 218 overall publications. The age group of 30-35 years had the maximum article publications with 201 out of 471 papers.

Table 2 highlights that newly recruited twenty five faculty member’s total publications were 18.84 papers on an average with a minimum of four and maximum fifty six papers. Overall about one third faculty members (n=9, 36 percent) had published between 11 to 20 papers and similar number of faculty also published more than twenty papers. Averagely there were 13.84 journal publications ranging from a minimum of three to forty four papers at the maximum. Faculty members published somehow fewer papers in conference proceedings, book chapters and other publications. This table also identified that about two-third (n=16, 64 percent) faculty members published their first paper during Ph.D.

**Table 2: Papers Published by Faculty Members**

Type of Publication	Papers Published Between Number (%age) Authors	Mean	Std. Dev.	Range
Total Papers Published (471 papers, 100%)	Up to 10	7 (28.0)	18.84	4 to 56 papers
	11 to 20	9 (36.0)		
	More than 20	9 (36.0)		
Journals (346 papers, 73.4%)	Up to 12	13 (52.0)	13.84	3 to 44 papers
	More than 12	12 (48.0)		
Conference Proceedings (69 papers, 14.6%)	None	8 (32.0)	2.76	0 to 11 papers
	1 to 5	14 (56.0)		
	More than 5	3 (12.0)		
Book Chapters (38 papers, 8%)	None	13 (52.0)	1.52	0 to 8 papers
	1 to 3	7 (28.0)		
	4 to 5	3 (12.0)		
	More than 5	2 (8.0)		

<i>Others</i> (18 papers, 4%)	None	19 (76.0)	0.72	1.487	0 to 6 papers
	1 to 3	5 (20.0)			
	More than 3	1 (4.0)			
<i>Publication of First Paper</i>					
<i>During PG</i>		6 (46.2)	3 (25.0)		9 (36.0)
<i>During Ph.D.</i>		7 (53.8)	9 (75.0)		16 (64.0)

**Table 3: NAAS Rated Journal Publications and IF in Thomson Reuters**

<i>Papers in NAAS Rated Journals between</i>	<i>Published Between Number (%age) Authors</i>		<i>Mean</i>	<i>Std. Dev.</i>	<i>Range</i>
<i>0 to 5 rating</i> (135 papers, 43.3%)	None	6 (24.0)	5.40	4.592	0 to 15 papers
	1 to 9	12 (48.0)			
	10 to 15	7 (28.0)			
<i>5 to 10 rating</i> (161 papers, 51.7%)	None	5 (20.0)	6.44	7.687	0 to 30 papers
	1 to 9	14 (56.0)			
	10 to 15	4 (16.0)			
	More than 15	2 (8.0)			
<i>10 to 15 rating</i> (13 papers, 4.1%)	None	20 (80.0)	0.52	1.194	0 to 4 papers
	1 only	1 (4.0)			
	2 only	2 (8.0)			
	4 only	2 (8.0)			
<i>15 to 20 rating</i> (3 papers, 0.9%)	None	23 (92.0)	0.12	0.440	0 to 2 papers
	1 only	1 (4.0)			
	2 only	1 (4.0)			
<i>Impact Factor in Thomson Reuters (111 papers)</i>					
	None	13 (52.0)	4.44	7.246	0 to 25 papers
	Up to 10	7 (28.0)			
	More than 10	5 (20.0)			

[Total 312 (100%) papers in NAAS rated journals]

Publications in National Academy of Agricultural Sciences (NAAS) rated journals in Table 3 shows that 5.40 papers were published on an average between 0 to 5 rating and the maximum range in this category was 15 papers. Most of the papers were published in 5 to 10 rating with 6.44 papers averagely and upper limit was 30 papers. Papers between the range of 10 to 15 and 15 to 20 rating were four and two at the maximum respectively. Table 3 also revealed 4.44 impact factored average papers indexed in Thomson Reuters with a maximum of 25 papers.

Results in Table 4 indicate that most of the faculty members published journal papers with more than three authors (5.80 papers on average with maximum 42 papers). This was followed by three, two and single authored papers. However, much variation was seen in single authored papers which showed that a single faculty member published 18 papers as the sole author. Faculty members published 7.40 average journal papers as first author with twenty two papers at the maximum.

**Table 4: Authorship Pattern of Faculty Members (Journals 346 papers)**

<i>Authorship Pattern</i>	<i>Papers Published Number (%age) Authors</i>		<i>Mean</i>	<i>Std. Dev.</i>	<i>Range</i>
<i>Single author</i> (21 papers, 6%)	None	22 (88.0)	0.84	3.602	0 to 18 papers
	1 only	1 (4.0)			



	2 only	1 (4.0)			
	18 papers	1 (4.0)			
<i>Two authors</i> (60 papers, 17.3%)	None	13 (52.0)	2.40	4.082	0 to 15 papers
	Up to 7	10 (40.0)			
	More than 7	2 (8.0)			
<i>Three authors</i> (61 papers, 17.6%)	None	9 (36.0)	2.44	3.029	0 to 11 papers
	Up to 5	12 (48.0)			
	More than 5	4 (16.0)			
<i>More than three authors</i> (145 papers, 41.9%)	None	8 (32.0)	5.80	9.605	0 to 42 papers
	Up to 10	12 (48.0)			
	More than 10	5 (20.0)			
	52 (15 percent)				
<i>Published as First Author</i> (185 papers, 53.46%)	None	2 (8.0)	7.40	5.470	0 to 22 papers
	Up to 9	18 (72.0)			
	More than 9	5 (20.0)			

*Note:* Percentage may not come to 100% because 287 journal papers + 52 none – about 15 percent in authorship above = 339 (data was missing for 7 cases)

**Table 5: Publications in Indexed Databases**

<i>Papers Indexed in</i>	<i>Mean</i>	<i>Std. Dev.</i>	<i>Range</i>	<i>Used Number (%age)</i>
<i>Scopus</i>	3.68	8.659	0 to 38 papers	8 (32.0)
<i>Web of Science</i>	2.20	4.958	0 to 19 papers	5 (20.0)
<i>PubMed</i>	1.04	3.611	0 to 14 papers	1 (4.0)
<i>Google Scholar</i>	5.64	11.793	0 to 46 papers	8 (32.0)
<i>Other Index</i>	0.20	1.000	0 to 5 papers	1 (4.0)

Table 5 shows that publications of majority of authors are indexed in Google Scholar database (5.64 average papers with maximum 46) followed by Scopus (3.68 average papers with maximum 38), Web of Science and PubMed. It was also revealed that 8 faculty members (32.0%) each used Google Scholar and Scopus while others databases were relatively less used by newly recruited faculty at the university.

Table 6 reveals that nearly three fourth of faculty members (n = 18, 72 percent) had registered account on Research Gate while thirteen of them (72.2 percent) had uploaded full text papers on it. They uploaded 105 papers (mean 5.83 papers) with maximum 25 publications.

**Table 6: Papers in Research Gate**

<i>Having Account on Research Gate</i>	<i>Yes</i> 18 (72.0)
<i>Number (%age)</i>	<i>No</i> 7 (28.0)
<i>Uploaded Full Text on Research Gate</i>	<i>Yes</i> 13 (72.2)
<i>Number (%age)</i>	<i>No</i> 5 (27.8)
Mean = 5.83 papers Std. Dev. = 7.326	
Range varied from 0 to 25 papers [105 papers uploaded]	

It is very apparent in table 7 that ten (40.0 percent) faculty members showed preference for online journals while five (20.0 percent) for print journals. There were 13 out of 25 (52.0

percent) who preferred to publish in both of these along with about one-third (n=8, 32.0 percent) showed interest in open access journals. It was also identified from this table that 15 (60.0 percent) teachers used parametric tests in their publications and 8 (32.0 percent) used non parametric tests. Furthermore, ten (40.0 percent) were using citation software too.

**Table 7: Format, Hypotheses Tests and Citation Software Preference**

<i>Preference to publish in</i>	<i>Yes Number (%age)</i>	<i>No Number (%age)</i>
<i>Online Journals</i>	10 (40.0)	15 (60.0)
<i>Print Journals</i>	5 (20.0)	20 (80.0)
<i>Both Online &amp; Print Journals</i>	13 (52.0)	12 (48.0)
<i>Open Access Journals</i>	8 (32.0)	17 (68.0)
<i>Hypotheses Tests used in papers</i>		
<i>Use Parametric Tests</i>	15 (60.0)	10 (40.0)
<i>Use Non Parametric Tests</i>	8 (32.0)	17 (68.0)
<i>Using any Citation Software</i>	10 (40.0)	15 (60.0)
BIBTEX, LATEX, EndNote and Mendeley were mentioned by 10 authors		

Table 8 reflects the authorship pattern of books and reviews. It is very clear from the table that less number of faculty members published books and reviews. It is also noticed that more authors (almost double) published reviews than books.

**Table 8: Authorship Pattern of Books and Reviews**

<i>Authorship</i>	<i>Books Published</i>	<i>Reviews Published</i>
<i>Single Author</i>	1 author (2 books)	2 authors (1 review each)
<i>Two Authors</i>	1 author (1 book) 2 authors (2 books each)	2 authors (1 review each)
<i>Three Authors</i>	1 author (1 book)	2 authors (1 review each) 2 authors (2 reviews each) 1 author (4 reviews)
<i>More than 3 Authors</i>	1 author (1 book) 1 author (2 books)	(29 reviews in all) 1 author (1 review) 2 authors (3 reviews each) 1 author (7 reviews) and 1 author (15 reviews)

Table 9 depicts the status of faculty's research publication in process in different type of publication sources. A total of 38 research publications produced by more than half of the faculty were in publication process in Journals, 6 publication by 3 authors in conference proceedings, 10 papers by 6 authors for reviews, two publication by 2 authors in books and 5 publications by 3 authors in other kind of publications.

**Table 9: Research output in Process**

<i>Publication Source</i>	<i>Research publication in Process</i>
<i>Journal</i>	(38 journal articles in all)

	2 authors with 1 paper each; 7 authors with 2 papers each; 2 authors with 3 papers each; 1 author with 4 papers; 1 author with 5 papers; and 1 author with 7 Journal papers in process
<i>Conference Proceedings</i>	3 authors with 2 papers each
<i>Reviews</i>	2 authors with 1 review each and 4 authors with 2 reviews each
<i>Books</i>	2 authors with 1 book each
<i>Other Publications</i>	2 authors with 1 publication each and 1 author with 3 other publications

Table 10 provides information on means, standard deviations and range for satisfaction scale on a rating of one to ten for publishing concerns.

**Table 10: Satisfaction Scale**

<i>Satisfaction Scale</i>	<i>Mean</i>	<i>Std. Dev.</i>	<i>Range</i>
<i>Time taken to submit / upload paper</i>	7.92	1.681	5 to 10
<i>Format or typesetting guidelines of Journals</i>	7.28	1.768	4 to 10
<i>Publication deadlines</i>	6.28	2.525	1 to 10
<i>Handling Peer Review Comments</i>	7.56	1.635	4 to 10
<i>Handling Peer Review Modifications</i>	7.72	1.990	1 to 10
<i>Handling Editor's Comments</i>	7.12	2.421	1 to 10
<i>Handling Plagiarism issues with Editor</i>	7.40	2.630	1 to 10
<i>Some journals demand fee for publishing articles</i>	4.76	2.862	1 to 9
<i>Some publishers are biased towards a particular group/region</i>	4.96	2.525	1 to 9
<i>Setting or maintaining your Author account with Journals</i>	7.12	2.438	1 to 10
<i>Clearing permission / copyright requirements</i>	6.44	2.694	1 to 10
<i>Ethical publication standards by journals and publishers</i>	6.16	3.158	1 to 10
<i>Time lag from submitting first draft to final publication of paper</i>	5.52	2.830	1 to 10
<i>Fairness of Research Measurement Metrics (h-index, IF etc.)</i>	6.08	2.783	1 to 10
<i>Recognition / Reputation of Journals (in which published)</i>	6.68	2.883	1 to 10

## Hypotheses Testing

Total 471 papers [H1] were published by all the twenty five faculty members (Table 11). Male faculty had 253 publications with a minimum of 4 to maximum 56 papers with an average of 19.46 publications, while female faculty had 218 papers (averagely 18.17 papers) ranging from 9 to 35 papers. Due to mean difference of just 1.29, no significant difference was found between male and female faculty members overall article publications.

**Table 11: Sex and Number of Total Article Publications**

<i>Sex</i>	<i>Number of Publications</i>	<i>Range</i>	<i>Mean</i>	<i>SD</i>
<i>Male (13)</i>	253	4 to 56 papers	19.46	14.437
<i>Female (12)</i>	218	9 to 35 papers	18.17	8.122
<i>Total</i>	471	4 to 56 papers	18.84	11.614

t = .273 (df 23), Mean Difference = 1.29, Sig. = .787 (p > .05)

Age group [H2] wise total article publications are given in Table 12. Faculty in the age group of 30-35 years had the maximum number of 201 papers published followed by 35-40 years with 159 publications. Age group of 40-45 had 64 and 25-30 years had published 47 papers. Range and means varied between different age groups but no statistical significant difference was found with ANOVA.

**Table 12: Age Group and Number of Total Article Publications**

<i>Age Group (in years)</i>	<i>Number of Publications</i>	<i>Range</i>	<i>Mean</i>	<i>SD</i>
25-30 (5)	47	4 to 16 papers	9.40	4.669
30-35 (11)	201	6 to 33 papers	18.27	8.776
35-40 (7)	159	10 to 56 papers	22.71	15.607
40-45 (2)	64	29 to 35 papers	32	4.243
Total	471	4 to 56 papers	18.84	11.614

F = 2.698 (df=3, 21), Sig. = .072 (p > .05), No further differences in Post Hoc Testing

Total 185 journal papers [H3] were published by all the twenty five faculty members (Table 13) as first author. Both male and female faculty had almost similar first authorship, so no significant difference was found as such.

**Table 13: Sex and First Authorship (Journals)**

<i>Sex</i>	<i>Number of Publications</i>	<i>Range</i>	<i>Mean</i>	<i>SD</i>
Male (13)	92	0 to 22 papers	7.08	6.171
Female (12)	93	0 to 17 papers	7.75	4.845
Total	185	0 to 22 papers	7.40	5.470

t = -.302 (df 23), Mean Difference = 0.67, Sig. = .766 (p > .05)

First authorship as per age group (H4) showed some variation in range and number of journal publications (Table 14), however, it was not statistically significant for this data.

**Table 14: Age Group and First Authorship (Journals)**

<i>Age Group (in years)</i>	<i>Number of Publications</i>	<i>Range</i>	<i>Mean</i>	<i>SD</i>
25-30 (5)	24	3 to 9 papers	4.80	2.490
30-35 (11)	60	0 to 12 papers	5.45	3.267
35-40 (7)	81	0 to 22 papers	11.57	7.721
40-45 (2)	20	7 to 13 papers	10.00	4.243
Total	185	0 to 22 papers	7.40	5.470

F (Welch) = 1.731 (df=3, 4.305), Sig. = .291 (p > .05), No further differences in Post Hoc Testing

**Table 15: Sex and Satisfaction Scale**

<i>Sex</i>	<i>Mean</i>	<i>Std. Deviation</i>	<i>t-test</i>
Male (13)	95.77	27.842	t = -.788 (df 17.024)
Female (12)	102.50	12.631	Mean Difference = 6.73
			Sig. = .441 (p > .05)

Tables 15 and 16 showed [H5 and H6] no significant difference between sex and age group wise analysis of satisfaction scale.

**Table 16: Age Group and Satisfaction Scale**

<i>Age Group (in years)</i>	<i>Mean</i>	<i>Std. Deviation</i>	<i>F (ANOVA)</i>
25-30 (5)	93.60	15.274	F = 2.046 ( df 3, 21) Sig. = .138 (p > .05) No further differences in Post Hoc Testing
30-35 (11)	108.73	15.812	
35-40 (7)	94.71	27.262	
40-45 (2)	74.00	29.698	

## Discussion

Implications of the findings of this study have illustrated that new faculty members had continued their scholarly activity from their student years as nine out of twenty five (36 percent) published their first paper during the postgraduate course (Table 2) and rest sixteen during Ph.D. A total of 471 article publications (Table 2) ranging from 4 to 56 papers produced by twenty five teachers shows a magnificent research excellence.

Out of 471, faculty had 346 (73.4 percent) journal papers ranging from 3 to 44 articles with an average of 18.84 papers (Table 2) followed by 69 papers in conference proceedings (14.6 percent). Book chapters and other publications were somehow less. Though publications in conference proceedings, book articles etc. were less in contrast with journal articles but it must be emphasized also that there were 312 papers in NAAS rated journals and 111 articles in Thomson Reuters (Table 3) along with having a space in reputed indexing databases too (Table 5). Since minimum number of papers was zero in NAAS rated journals hence all faculty members had not published in these journals. In addition to this, they had much less publications of books and reviews (Table 8). But this could be justified assuming that they were newly recruited teachers.

As indicated (Table 4), out of 346 journal articles, just 21 (6 percent) had sole authorship. But results also highlighted that more than half (n=185 papers, 53.46 percent) articles were published as first author by faculty members. These findings conform to previous research that single authored publications are less in agriculture and allied disciplines (Sife et al.<sup>14</sup>), although it is advisable to publish single author papers (Hilmer and Hilmer<sup>15</sup>).

Most likely, faculty members also used Research Gate for scholarly communication as more than two-third of them (n=18, 72 percent) were having account in it and 13 (72.2 percent) uploaded full text articles on it (Table 6). New agriculture faculty used parametric and non-parametric tests as well (Table 7) in their scholarly research and ten (40 percent) were also using citation software. More than half (n=13, 52 percent) of them showed their interest in both print and online journals too while individually online journals accounted for 40 percent (10 authors) and print ones by 20 percent (5 authors).

In the ten point satisfaction scale (15 items) for publishing concerns (Table 10), most of the items had a mean of five and above. Findings of this study revealed no significant differences in sex and age group wise analysis of the six hypotheses with t-test and ANOVA (Tables 11 to 16).

We turn next to another consideration that needs to be brought up. Apart from a great number of physical documents and traditional library services at HAU, the university library is well equipped with electronic resources and ICT infrastructure. And it had been identified that e-documents in a library lead to more research productivity (Rawls<sup>20</sup>). Siwach and Parmar<sup>18</sup>; and

Parmar and Siwach's<sup>19</sup> both studies had shown a good number of citations and publications at HAU. Hence, where researchers have access to excellent library collection, scholarly output is bound to increase.

### **Limitations**

While overall findings of this study illuminate research excellence of new faculty, but it's quite a common fact that all research investigations have inherent limitations also. Here, we discuss a few of such relevant aspects.

Now-a-days many newly recruited faculty may already have published some papers during their student years (both postgraduate and research level). However, this aspect was not examined in this study (that how many papers were published during student years and how many during job). This situation is similar to Ph.D. students who are at dissertation stage and are more likely to publish papers than those who had just started research or attending classes (McGaskey<sup>21</sup>). Furthermore, does producing scholarly output from PG years remains intact for new university faculty as career progresses, is beyond the scope of this study.

Since the current study was not intended to learn about the factors affecting research productivity of newly recruited faculty members, thenceforth, no such attempt is made. Therefore, further inquiry is called upon in this matter for future investigators.

### **Conclusion**

Given the discernible importance of academic research for new university faculty in the discipline of agricultural sciences, this study examined the research excellence of newly recruited faculty members at HAU, Hisar. Taking a look at the results of this paper, we feel tempted to say that faculty members showed research excellence in scholarly output. Implications of this article also suggested that their research candor has remained intact right from the student years of post-graduation and Ph.D. level. No specific sex and age group differences (with parametric tests) were found in: total number of article publications; first authorship of journal articles; and satisfaction scale (our own) related to publishing concerns. As per author's viewpoint, more research is warranted in this discipline.

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