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FACTORS INFLUENCING RESEARCH PRODUCTIVITY OF UNIVERSITY TEACHERS: DEVELOPMENT AND VALIDATION OF A RESEARCH PRODUCTIVITY SCALE

Gulnaz Akbar¹ & Munaza Nausheen²

¹Lecturer Department of Education Government College for Women University, Sialkot

²Associate Professor Institute of Education & Research University of the Punjab, Lahore

KEYWORDS	ABSTRACT
Research Productivity, University Teaching, Factor Analysis	This study presents the development and validation an instrument to measure the research productivity of the university teachers, based on the contemporary, well-known models from the research on motivation and factors affecting the research productivity of university teachers. Instrument was validated by collecting expert's opinion and exploratory factor analysis of data collected from a sample of 100 university teachers. The Research Productivity Scale (RPS) provided a theoretical and analytical framework to guide future research and may effectively be used for evaluating the research productivity of university teachers.  2026 Journal of Social Sciences Development
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Introduction

The role of faculty members in higher education has undergone a profound transformation, gradually shifting from a primary focus on teaching to a dual emphasis that heavily prioritizes research output. "The mental activity of reflection and learning new concepts" is one of the many definitions of "research" (Pratt, Margaritis & Coy, 1999) reflecting that the university's primary objective is knowledge creation (Norin, Saeed & Khan, 2016). Research productivity is considered to be the cornerstone for university rankings, institutional prestige, and global knowledge generation, while directly influencing individual faculty career trajectories, tenures, and funding opportunities.

Despite setting various goals and objectives, developing countries continue to lag behind developed nations in the field of education. According to one of the key factors behind this gap is the limited use of research-based methodologies (Sanyal and Varghese, 2006). Research contributes significantly to economic and social development, both of which lead to national development. As a result, developing countries like Pakistan have increased emphasis on university-level research to stimulate academic growth. Faculty members in higher education play a critical role in driving research efforts (Rowley, 1996). Skilled educators enhance not only their own professional standing but also that of their institutions at both national and international levels. In Pakistan, the Higher Education Commission (HEC) plays a central role in raising instructional standards and promoting modern research methodologies in higher education institutions. Recognizing the educational impact of scholarly work, both public and private institutions have introduced several initiatives to motivate academics across disciplines (Higher Education Commission, 2018). These initiatives increasingly emphasize and support research practices among faculty members (Towes & Yazedjian, 2007).

Factors intrinsic to the nature of academic work significantly influence scholarly engagement and reflection. Recently, there has been a growing interest in the motivating factors for university instructors to conduct research, (Gordon, 2011). However, assessing the research productivity remains a complex process. Available assessment methods generally rely on publication counts or citation metrics, often failing to capture the complex nature of academic research, including collaborative research projects, mentorship activities, interdisciplinary work, and wider public interest.

To address this gap, this study focused on the development and psychometric validation of the Research Productivity Scale (RPS), an instrument developed specifically for university teachers. Based on the contemporary educational literature and organizational psychology, and by using a two phase process, this instrument may provide higher education institutions with a reliable, valid, and standardized tool that reflects the full scope of the factors that contribute and influence the research contributions of the academic faculty in universities.

Literature Review

The evaluation of the research productivity of university teachers is considered to be a complex task due to an ongoing interplay between personal motivation of teachers and diverse institutional factors. Generally, Intrinsic motivation, characterized by personal interest, autonomy, and professional passion, is the primary factor for the research productivity as it often significantly outperforms the external incentives such as performance based incentives and promotion to higher academic levels (Stupnisky et al., 2022). In some studies, structural support mechanisms, including infrastructure, workload allocations, and funding opportunities are reported as significant factors that enable academics to enhance their research contributions. (Doğan & Arslan, 2024; Stupnisky et al., 2022).

Research also suggest that although there is a great emphasis on scholarly academic activities and research productivity remains mostly based on quantitative matrices, such as number of publication and citation indices. It is also acknowledged that these quantitative metrics provide a limited understanding of research contributions by ignoring the overlooking qualitative aspects such as research significance, peer review process, interdisciplinary collaboration, and usability and applicability of the research for national and societal development. (Doğan & Arslan, 2024)

Therefore, a comprehensive measurement tool for evaluating both the intrinsic as well as multi-dimensional outcomes of research work across diverse institutional contexts needs to be developed.

Research Objectives

The study aimed to

1. Identify the factors that influence research productivity of university teachers.
2. Develop and validate a Research Productivity Scale.

Methodology

The development of Research Productivity Scale (RPS) was carried out in two phases. First phase involved scale development and content validation of the scale and items. In the second phase reliability analysis and exploratory factor analysis (EFA) were performed to establish the psychometric properties of the Research Productivity Scale.

A sample of 100 faculty members of a public sector university in Lahore, Pakistan was selected by using a multistage stratified random sampling technique to ensure representativeness across different academic levels / cadres of the teachers from two faculties (Faculty of Education and Faculty of Social Sciences) at a large public sector university in Lahore, Pakistan. Sampled Faculty members were approached directly for participation, and they were clearly informed about the intended outcomes and focused areas of the study. In order to address the ethical concerns special emphasis was placed on the privacy of the shared information. Participants were assured that their responses would remain confidential and would not be disclosed to their institutions or any third party. For anonymity, each participant was assigned a code for data analysis, interpretation, and reporting.

Results and Discussion

In the first phase, after a detailed review of the related literature and previous research on research productivity, researchers identified seven factors namely *Self Efficacy, Age, Social Network, Département Size, Culture, Research Support, Teaching Load*) comprising of 47 items that were related to research productivity of university teachers as shown in table 1.

Table 1: Description of factors and number of items

Sr.No.	Factor	No. of Items
1	Self Efficacy	7
2	Age	6
3	Social Network	11
4	Departmental Size	7
5	Culture	5
6	Research Support	5
7	Teaching Load	6
	Total	47

A seven-point response scale was employed to explore teachers' perceptions regarding the factors that affect their research output. Details of the response scale are presented in Table 2

Table 2: Description of the Response Scale

Sr.	Seven-Point Scale	Description	Scale Scores
1	Not at all important	Not even once	1
2	Low important	(Between 1-20%)	2
3	Slightly important	(Between 21-40%)	3
4	Slightly important than low important	(Between 41-60%)	4
5	Important	(Between 61-80%)	5
	Very important	(Between 81-90%)	6
7	Extremely important	(More than 91%)	7

Content Validation of the Research Productivity Scale

A panel of four experts, in the field of education, research, instrument development and psychometrics, reviewed 47 items related to seven factors of Research Productivity scale. developed the instrument to ensure its content validity. The expert panel suggested several modifications, such as, using a predefined scale to help participants respond within a clear range for example, "0" representing no publications and "1" indicating 1-7 publications, and so on. Revisions were also recommended for the "social network" and "research support" factors related to research productivity, with two items revised under the social network category. Following the expert review, the instrument was administered to a sample of 100 faculty members from Faculty of Education and Faculty of Social Sciences.

Reliability Analysis

The Cronbach's alpha values of the Research Productivity Scale factors and and number of items are presented in table 3

Table 3: Scale Reliability

Factors List	No. of Items	(α)
RP Scale	47	.97
1 (SE)	7	.89
2 (Age)	6	.82
3 (SN)	11	.86
4 (RS)	5	.82
5 (Culture)	5	.79
6 (DS)	7	0.84
7 (TL)	6	0.82

Factor Analysis

Exploratory Factor Analysis was applied to identify the underlying structure of factors. In order to evaluate sample appropriateness and assess the suitability of the data for factor extraction. The Kaiser-Meyer-Olkin (KMO) value was 0.89 that indicating excellent sampling adequacy, while Bartlett's Test of Sphericity was statistically significant ($p = 0.00$). These findings validated the use of factor analysis on the data obtained from 100 university faculty members, using the Principal Component Analysis (PCA) approach.

Table 4: KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.89
Bartlett's Test of Sphericity	Approx. Chi-Square	3963.91
	df	1081
	Sig.	.00

To check the suitability of the collected data for factor analysis, the Kaiser-Meyer-Olkin (KMO) test was applied, yielding a value of 0.897. This, along with a p-value of .00, confirmed the appropriateness of data for dimensionality reduction by using Exploratory Factor Analysis (EFA) via Principal Component Analysis (PCA). The proportion of variance accounted for by each extracted factor, together with their corresponding Eigen values, is presented below.

Table 5: Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	20.80	44.25	44.25	20.80	44.25	44.25	11.89	25.31	25.31
2	3.01	6.41	50.67	3.01	6.41	50.67	6.94	14.78	40.09
3	2.22	4.73	55.40	2.22	4.73	55.40	3.51	7.47	47.56

4	1.98	4.21	59.62	1.98	4.21	59.62	3.51	7.47	55.03
5	1.54	3.27	62.90	1.54	3.27	62.90	2.40	5.11	60.15
6	1.31	2.79	65.69	1.31	2.79	65.69	1.96	4.18	64.34
7	1.18	2.52	68.22	1.18	2.52	68.22	1.82	3.88	68.22

Extraction Method: Exploratory Factor Analysis

In order to assess the construct validity and ensure the appropriateness the Kaiser-Meyer-Olkin (KMO) test was conducted to determine whether the data was appropriate for exploratory analysis. The obtained KMO value test also helped determine whether the inter-item correlations were sufficient for conducting Exploratory Factor Analysis (EFA). EFA was then carried out to extract Eigen values and identify the percentage regarding the proportion of variance accounted for by each factor in the dataset. The analysis revealed that seven factors had Eigen values greater than 1, indicating strong underlying dimensions. The Research Productivity Instrument, which contained 47 items, had a total cumulative variance of 68%, with the lowest Eigen value of 1.18. These values indicate a solid factor structure and meaningful grouping of items.

The Self-Efficacy comprised seven items and accounted for 44.25% of the total variance. The three items of Age explained 6.41%. The third factor Social Network, having three items accounted for 6.41% of the total variance. The fourth factor, Research Support, included two items and contributed 4.73%. Similarly, the fifth factor, Culture, consisted of two items and explained 4.21% of the variance. The sixth factors, Departmental Size, was represented by four items and contributed 3.27%, while the seventh factor, Teaching Load, also made up of four items, explained 2.79% of the variance. The eighth factor, which also contained four items, accounted for 2.52% of the total variance.

All factor loadings surpassed the suggested minimum value of 0.50, indicating strong correlations among items and confirming the robustness of the factor structure.

Table 6: Factor Loadings

	Self-Efficacy	Age	Social Network	Research Support	Culture	Departmental Size	Teaching Load
SE-1	.61	.57		.43		.39	
SE2	.72	.56		.45			
SE3	.56		.43		.51	.38	
SE4	.66	.49	.46	.38			
SE5	.75	.54		.37		.53	
SE6	.68	.53	.48	.39			
SE7	.56					.56	
A_1	.46	.70			.33		
A_2	.42	.68	.64	.56	.45		.33
A_3	.43	.62			.34		
A_4	.51	.75	.67		.43		.34
A_5		.81					.43

A_6	.64	.75			.39		.37
SN_1			.77	.33			.39
SN_2	.63	.51	.77	.35			
SN_3		.48	.62	.34		.43	
SN_4		.44	.71		.54	.45	
SN_5		.40	.61	.37	.56	.54	
SN_6	.43	.43	.69	.39	.37	.43	
SN_7	.45	.57	.66			.47	
SN_8	.44	.58	.62			.39	
SN_9	.43		.70				
SN_10	.37		.50				.43
SN_11	.39	.55	.66				.55
RS_1				.70		.45	.44
RS_2		.46		.77		.43	.43
RS_3		.48	.45	.72			.57
RS_4		.47	.57	.67		.40	.39
RS_5		.42	.53	.59			
C_1	.45		.48		.65		
C_2	.34			.42	.63		
C_3	.43	.53			.74		.34
C_4	.37	.45	.47	.53	.60		
C_5	.39				.65		
DS_1		.43				.69	.43
DS_2	.56	.47	.45		.47	.63	.56
DS_3	.47	.59	.54		.41	.56	
DS_4	.44		.63	.53	.46	.60	.46
DS_5			.34	.43	.50	.62	
DS_6	.54			.47	.57	.81	
DS_7		.57	.43	.58	.48	.79	
TL_1	.45	.56				.46	.83
TL_2		.47	.42	.54	.54	.45	.76
TL_3							.77
TL_4							.66
TL_5		.46					.68
TL_6			.56	.45		.64	.77

The above table shows the factor loadings associated with different aspects of research productivity. Loadings for Self-Efficacy were between .56 and .61, while Age had factor loadings from .71 to .75. Social Network demonstrated loadings from .66 to .78, and Research Support ranged from .78 to .82. The factor Culture consistently showed a loading of .65. For Departmental Size, the values fell between .69 and .79. The loadings for Teaching Load ranged between .77 and .83. These values indicate strong item correlations within each factor, meeting the acceptable threshold for factor loading in social sciences. In other words, all items met the minimum factor loading threshold, supporting the scale's structural validity.

Conclusion

This study aimed to develop and validate the Research Productivity Scale (RPS) as an instrument for assessing the research productivity of the University teachers. The internal consistency of the instrument demonstrated strong reliability, highlighting the trustworthiness of the measured constructs. The study effectively addressed the research questions aligned with its core objectives. The validation of the RPS involved empirical evidence from a sample of university teachers from various disciplines. Employing content validation and exploratory factor analysis, along with tests for internal consistency and construct validity, the findings demonstrate that the

scale possesses strong psychometric properties. By establishing a balanced and comprehensive framework for assessment, this research offers university leaders, policymakers, and researchers a refined instrument to better evaluate faculty performance, inform institutional reward systems, and introduce strategies to promote a thriving research culture

This study has some limitations. Data were collected from only two academic disciplines which may limit generalizability. Future studies should test the RPS across diverse disciplines and educational settings.

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