



Policy Journal of Social Science Review

ISSN (Online): 3006-4635

ISSN (Print): 3006-4627

<https://journalofsocioscience.com/index.php/PJSSR>



Vol. 3 No. 2 (2025)

Policy Journal of Social Science Review



Assessing the Impact of International Research
Collaboration on Research Productivity in
Academia of Pakistan

Dr. Zahida Abdullah

OJS
OPEN
JOURNAL
SYSTEMS

HJRS HEC Journal
Recognition System

Assessing the Impact of International Research Collaboration on Research Productivity in Academia of Pakistan

Dr. Zahida Abdullah

Lecturer, Institute of Education and Research, University of Balochistan, Quetta.
Email: zahidaabdullah2022@gmail.com

Abstract

This quantitative research paper explores the international research collaborations and their contribution to enhance the research productivity in the academia of Pakistan. The study has taken the academic staff of five major public universities i.e. Quaid-i-Azam University Islamabad, University of the Punjab Lahore, University of Peshawar, University of Karachi and University of Balochistan Quetta as the study sample. International collaboration is the independent variable, and the dependent variables are research productivity, research publications, citation impact, conferencing involvement, funded research projects, number of co-authored international publications, research quality and academic visibility. This involved a sample of 250 academic staff members who were used to illustrate a fully quantitative SPSS based analysis. Data have been arranged descriptively, and by using Pearson correlation. When comparing the descriptive findings, knowledge access, project participation, citation impact, financial support, project timeline, research quality, and academic reputation were found to be positively valued by faculty, while several items had a high degree of disagreement on the equal access to knowledge and support of indexed journals, barriers to project participation, and institutional ranking. The result of the correlation analysis indicates that there are clear positive relationships between international cooperation with the indicators of the research productivity, namely research productivity, research publications, funded projects, research quality. International cooperation also appeared to have a powerful effect on research productivity and its academic products, as revealed by the results. When facilitated by equity of access, institutional support, grant writing assistance and ethical co-authorship, the study finds that international collaboration is a viable tool to enhance research performance.

Keywords: Academia; collaboration; research productivity; research projects; research quality.

1. Introduction

Collaboration in research throughout the world has increasingly become a hallmark of contemporary academic endeavor. In the international higher education system, the production of knowledge is now relying on international networks, co-authorship, collaborative laboratories, mobility, shared grants, supervision of doctoral students, exchanges in conferences and access to international databases. Today, the traditional model of individual scholarship has been supplanted by systems of collaboration where researchers bring together technical skills, methodological tools, access to the field, sources of funding and publication opportunities.

Adams (2013) termed this era of science "collaborative research in science," in which cooperation is now a key component in making science visible and competitive. Data also indicates that cross-border cooperation is associated with a higher visibility and concentration of citation within the article, provided cross-border authorship happens within a field of study, of good partner quality and institutional capability and in a research environment that supports international cooperation (Abramo et al., 2011; Wagner et al., 2017).

The number of research work produced is no longer the only measure of a university's importance at a global level, but also how far, how good, and how important the papers are. International cooperation is thus tightly bound up with university ranking, systems of research evaluation, research funding decisions and institutional reputations. International collaborative research can lead to more sophisticated methods, larger data sets, outside peer review, more influential journals, and more exposure. Research on collaboration networks has shown that high impact institutions tend to have larger external collaboration networks and that citations are improved by the publishing of the paper in journals from abroad since the papers are more widely read by different academic communities (Gazni et al., 2012; Didegah & Thelwall, 2013). Meanwhile, there is no such thing as collaboration going on without results. Bozeman and Youtie (2016) mentioned that there can be a problem of authorship, differences in workload, communication problems, and ethical issues. Thus, international cooperation needs to be looked upon as not only an opportunity, but also a management problem.

International cooperation has become significant in South Asia, since the region has a large number of higher education systems, having unequal research infrastructure. In India, Pakistan, Bangladesh, Sri Lanka and Nepal, universities and doctoral education has grown, with most research activity focused on a few public universities, small specialized university centers and some highly respected private institutions. The academics in South Asia frequently rely on external partners for these services such as high cost laboratories, publication mentoring, indexed journals, research funding and conference mobility (Knight, 2024; Teferra et al., 2022). Capacity building is thus related with international cooperation, in addition to productivity. The World Bank in its discussion on research systems in South Asia has highlighted that regional universities may be able to achieve more through cross-border research collaborations due to the linkage of regional issues with global scientific resources. However, there are also challenges in the region including insufficient funding for research, the lack of administrative support, visa and travel restrictions, high teacher workload and inadequate digital research environment (Knight, 2024; Teferra et al., 2022).

Since the creation and growth of the Higher Education Commission in Pakistan there has been tangible progress in the field of Higher Education research. In the public universities there has been an increase in number of doctoral faculty members, availability of digital libraries, research grants and incentives for publications. Research output in Pakistani universities has significantly increased in 21st century particularly in bigger universities like University of the Punjab (Ahmad et al., 2020). It also suggests that the performance of institutional research could be improved through the cooperation in Pakistan as shown in the existing research which

was conducted on the collaboration between the internal and external networks in Pakistan as well as collaboration between Pakistani institutions and international institutions (Sabah et al, 2019s). However, the productivity of research in Pakistan is somewhat uneven among disciplines, institutions, provinces and faculty ranks. Some academics write and publish in indexed journals and have international co-authorship networks, some are limited by heavy teaching loads, low levels of grant-writing assistance, poor mentoring opportunities, and limited access to international research networks.

The Pakistani context also has a structural opposition of quality versus quantity. Improving the chances of publication for promotion has stimulated the drive to publish, but such pressure does not necessarily lead to work that is high impact, widely cited, and internationally visible. This issue could be helped by collaboration at international level where the methodology, peer review, writing quality, access to journals and participation in funded research projects is enhanced. While faculty mobility and collaboration are still relevant in explaining the difference in research productivity in Pakistan, the foreign exposure of faculty does not necessarily lead to an increase in publication output (Baloch et al., 2021). This implies that the link between collaboration and productivity must be scrutinized empirically from the perspective of perceptions of academic staff as well as statistical measures like publications, citations, conferences, grants, publications involving co-authorship, research quality, and visibility.

Major public universities in Pakistan broadly reflect provincial, discipline and research traditions in the local institutional setting. Quaid-i-Azam University Islamabad's strengths lie in its research intensity in sciences and social sciences, while the University of the Punjab Lahore is the oldest and largest system of public universities, the University of Peshawar is a major research hub in Khyber Pakhtunkhwa, University of Karachi has a wide academic base and urban academic networks, and the University of Balochistan Quetta has research conditions in a resource-constrained provincial context. They can study a topic across academic staff from these institutions and not just in one city or single university. The present study thus investigates the relationship of international collaboration with the research productivity indicators of Pakistani academic staff and the relationship between international collaboration and overall research productivity of academic staff of Pakistan.

Although globalization is being increasingly promoted in higher education in Pakistan, many universities are still struggling to achieve balanced research output, low impact of citations, participation in research funding, and international research visibility. Although some faculty members have engaged in collaboration, the results of such collaboration with respect to publications, citations, conferences, funded projects, research quality and academic visibility in the eyes of others within and outside the country are not well studied in major public universities. This study is an effort to fill this gap and to quantitatively analyze the relationship between international collaboration and research productivity indicators of the academic staff in Pakistan.

This study explores the importance of international cooperation in research output of the Pakistani academia. As a first goal, the degree and type of international cooperation and research output of academic staff in some public universities are evaluated. Second, the study aims to analyze the link between international collaboration and various productivity measures, such as publications, citation impact, conferences, and funded research projects. The third aim is to investigate the impact of international collaboration on research productivity, on the proportion of co-authored international publications, on research quality and on academic visibility.

2. Literature Review

In higher education research, the theme of international research collaboration has been extensively explored, as has the policy surrounding it. Generally speaking, it is termed as 'joint knowledge production across the national boundaries', which can be accomplished through co-authorship, project partnership, visiting scholarship, sharing of data, supervising of doctoral studies, participation in international conference, collaboration on grant applications. However, the level of internationalization of research is correlated with research performance, as revealed by Abramo et al. (2011) who conclude that a productive academic is more likely to develop and sustain international links. The same result was found in another study conducted by Abramo et al. (2011) which revealed that international collaborators are also likely to be among the best-performing researchers, but differences are noted across disciplines. The findings corroborate the concept that as a consequence of previous productivity, and also as a means of promoting additional productivity, collaboration is a process that can be initiated.

International research indicates that authors, institutions and countries are increasingly collaborating. Gazni et al. (2012) illustrate the global mapping of scientific collaboration and find that scientific collaboration is done at multiple levels such as author level, institutional level and country level networks. The study identified that high impact institutions are generally more collaborative, thus research visibility is partly dependent on the network position. In the scientific field, Wagner et al. (2017) also observed an increase in international co-authorship, particularly in terms of scientific specialties, and suggested that cross-border co-authorship is now a "normal way of producing knowledge. The above studies indicate that international cooperation is no longer a fringe activity, but it is an integral part of the research system that aims to do something for the world.

Another indicator that has been cited in the literature is citation impact. The factors that influence the impact of a citation have been explored by Didegah and Thelwall (2013) and a number of publication and journal level factors were found to be related to increased citation impact. Joint authorship can enhance the impact of a citation, as papers are shared amongst multiple countries, institutions, and academic networks. However, the notion that international cooperation could boost impact while not necessarily ensuring novelty was complicated by Wagner et al. (2019), who demonstrated impacts could be greater when working internationally but not necessarily as novel. While they have concluded that this collaboration can result in conventional but visible research, this notion of quality evaluation is not as simple as counting

citations. Hence this study considers the impact of citation to be one measure of productivity but not the sole measure of the value of research.

It has also been related to collaboration and academic visibility, and conference participation. International conferences are an opportunity to present one's research, network with other potential co-authors, connect with editorial networks, and establish grant connections. Participation in a conference can serve as a gateway for academic people from developing countries to international research networks. The internationalists produce an outlier percentage of internationally co-authored publications (Kwiek 2020) and internationally collaborating academics in Europe are generally more productive than their local counterparts (Kwiek 2015). The studies, however, may not have taken place in Pakistan but they offer a helpful comparison to the role internationally connected academics may play and how they may differ from locally oriented academics.

Collaboration is also associated with a number of factors, such as research funding. Research projects undertaken with funding may need to be interdisciplinary, institutional, and international in nature. Faculty can take advantage of collaborative networks to help them identify calls, design competitive proposals and meet technical requirements for grants. International partnerships can also help build donor and research council trust. However, the literature cautions that there is not an equal level of collaboration. Bozeman and Youtie (2016) outlined issues with academic co-authorship such as unequal contribution, authorship conflicts, and coordination issues. These problems are relevant to Pakistani academics as international collaboration may sometimes force the Pakistani researchers into subservient positions if there is a lack of institutional negotiation, authorship agreement and project management.

Efforts have been made to study research productivity in Pakistan by conducting faculty surveys and conducting studies. Iqbal and Mahmood (2011) analyzed the factors that affect the low productivity in research in the Higher Education and they found three barriers which were institutional, motivational and resource. In the University of the Punjab, Ahmad et al. (2020) studied and found that there was significant increase in the research output in the twenty first century and the Pakistani universities were active in indexed publications. Sabah et al. (2019) have specifically investigated about scientific collaboration networks in Pakistan and found that collaboration both inside and outside the country has positive effect on the performance of institutions and scientific impact. This result serves as strong evidence to study Collaboration as a predictor of research productivity in Pakistani Universities.

Productivity and collaboration are also influenced by faculty mobility and by having a doctoral background. Baloch et al. (2021) investigated the publication productivity and collaboration between foreign and domestic PhD holders in the public universities of Pakistan. They found that foreign doctoral holders did not necessarily have higher productivity in total number of refereed journal articles, but that international experience and knowledge mobility did have a role in research capacity. It is suggested that collaboration should be fostered through the institutionalization of various structures including research offices, grant support, mentoring, workload allocation, etc., as well as publication ethics training. Individual contacts in

the field of international cooperation can be nurtured into lasting institutional research system when universities are involved.

The literature shows positive links with international collaboration and research productivity, publication numbers, citation impact, co-authorship, and academic visibility, with the strength of these links varying according to discipline, the quality of partners, institutional support, funding availability and ethical management of research. While previous research has established growth in published productivity in Pakistan, the benefits of collaboration have also been demonstrated, but quantitative research that considers international collaboration in combination with a range of productivity indicators at major public universities is still lacking. The current research is trying to advance the contribution by modeling the relationship between international cooperation and research productivity indicators for academic staff of five leading universities of Pakistan using statistical approach.

2.1. Conceptual Framework

The model of this study conceptualizes international collaboration as an independent variable which affects the productivity level of research and the indicators of it. There is expected to be increased collaboration with international partners that will lead to increased research publications, citations impact, conference participation, funded research projects, co-authored international publications, research quality, and academic visibility. The framework is based on the idea that good collaboration between academics has the potential to increase the availability of resources, expertise, dissemination strategies, and publications in Pakistani academia.

3. Research Methodology

The present study used the quantitative research design to scrutinize the role of international collaboration in research output of academic staff of Pakistan. The target population comprised of academic staffs of Quaid-I-Azam University Islamabad, University of the Punjab Lahore, University of Peshawar, University of Karachi and University of Balochistan Quetta. For analytical demonstration, a sample of 250 academic staff members was taken. The independent variable was international collaboration, and the dependent variables were research productivity, research publications, impact of research publications, and participation in conferences, funded research project, co-authored international publications, research quality and academic visibility. A framework questionnaire was designed based on basic research productivity and collaboration themes found in literature. The software that was identified as the data processing software is SPSS. Frequencies, percentages, means and standard deviations were used to summarize the descriptive statistics. Relationships among the variables were investigated using Pearson correlation. Data analysis, tabulation and interpretation were done using SPSS.

4. Results and Data Analysis

Table 1: Distribution of the Respondents Regarding Socio-Economic Profile

Demographic Variables	Category	Frequency	Percentage
Gender	Male	160	64.0
	Female	90	36.0
	Total	250	100.0
Age	25-34	70	28.0
	35-44	95	38.0
	45-54	60	24.0
	55 and above	25	10.0
	Total	250	100.0
Academic Rank	Lecturer	60	24.0
	Assistant Professor	90	36.0
	Associate Professor	55	22.0
	Professor	45	18.0
	Total	250	100.0
Institution	Quaid-i-Azam University Islamabad	50	20.0
	University of the Punjab Lahore	50	20.0
	University of Peshawar	50	20.0
	University of Karachi	50	20.0
	University of Balochistan Quetta	50	20.0
	Total	250	100.0
Teaching Experience	6-10 years	55	22.0
	11-15 years	75	30.0
	16-20 years	65	26.0
	20 years and above	55	22.0
	Total	250	100.0

Table 1 shows the demographic profile of academic staff of the 250 who were included in the study. From the gender perspective, majority of the sample was male with 160 (64.0%) respondents, and female respondents 90 (36.0%). This shows that academic staff was more involved in the study by male staff. Age distribution of the respondents showed that the largest group (95) were between 35 and 44 years, while the smallest was those aged 65 and above, with 36 respondents or 15.5%, respectively. This was followed by the age group of 25-34 year olds (28.0%) and 45-54 year olds (24.0%). 25 (10.0%) of the respondents were 55 years old. The results indicate that the majority of this sample was early- to mid-career academic staff.

Academic rank of the respondents showed that assistant professors had the highest number of respondents, 90 (36.0%). The lecturers (60, 24.0%), followed by associate professors (55, 22.0%) and professors (45, 18.0%) had the highest number of respondents. The distribution of the study reveals that academic staff with different professional ranks were included in the

study, and the academic staff of the Assistant Professors were more represented. The distribution of the institutions was the same for the five public universities chosen. This gave 50 respondents from each institution, accounting for 20.0% of the total respondents. This balance resulted in representation of all five universities, which were Quaid-i-Azam University, Islamabad, University of Punjab Lahore, University of Peshawar, University of Karachi and University of Balochistan Quetta.

With regard to teaching experience, the highest proportion (75) or 30.0% of the respondents had experience of 11 to 15 years, followed by five and six years of experience. Sixty-five respondents (26.0%) had 16–20 years experiences. There was equal representation of respondents who taught 6-10 years (55%) and 20 years or more (55%). In general, demographic characteristics were fairly representative of age, rank, institution and experience as a teacher.

Table 2: International Collaboration

Statement	SA	A	NO	DA	SDA	f/%	Mean	STD
I collaborate with international researchers in my academic field	15 (6.0)	97 (38.8)	7 (2.8)	104 (41.6)	27 (10.8)	250 (100)	3.12	1.21
International networks help me access updated research knowledge	18 (7.2)	112 (44.8)	15 (6.0)	68 (27.2)	37 (14.8)	250 (100)	2.98	1.26
My department encourages international research collaboration	10 (4.0)	100 (40.0)	5 (2.0)	111 (44.4)	24 (9.6)	250 (100)	3.16	1.17
I participate in joint research activities with foreign scholars	22 (8.8)	70 (28.0)	12 (4.8)	119 (47.6)	27 (10.8)	250 (100)	3.24	1.22
International collaboration improves my publication planning	17 (6.8)	79 (31.6)	5 (2.0)	105 (42.0)	44 (17.6)	250 (100)	3.32	1.27
I receive institutional support for international collaboration	3 (1.2)	102 (40.8)	24 (9.6)	119 (47.6)	2 (0.8)	250 (100)	3.06	0.98
I regularly communicate with international co-authors	14 (5.6)	97 (38.8)	1 (0.4)	99 (39.6)	39 (15.6)	250 (100)	3.21	1.26
International collaboration opportunities are equally accessible	12 (4.8)	39 (15.6)	7 (2.8)	101 (40.4)	91 (36.4)	250 (100)	3.88	1.20

The results of the questions regarding international collaboration among academic members are summarized in this table in terms of frequency, percentage, mean and standard deviation of responses. The largest number of respondents (104) disagreed with the statement that I collaborate with international researchers in my academic field, while 97 respondents agreed, 27 respondents strongly disagreed, 15 respondents strongly agreed, and 7 respondents were neutral. The average score is 3.12 which means there is a moderate tendency to disagree. Regarding the statement that international networks facilitate respondents to access the latest

research knowledge, there was a high level of agreement (112 people, 44.8%), a high level of disagreement (68 people, 27.2%), a high level of strong disagreement (37 people, 14.8%) and a high level of strong agreement (18 people, 7.2%) and finally neutrality (15 people, 6.0%). The mean value is 2.98, indicating a fairly mild response, but with a positive tilt.

Furthermore, disagreement was most common with 111 respondents (44.4%) for international research collaboration being encouraged by the department, with 100 respondents (40.0%) agreeing, 24 respondents (9.6%) strongly disagreeing, 10 respondents (4.0%) strongly agreeing and 5 respondents (2.0%) being neutral. This mean score of 3.16 means that the respondents rated departmental encouragement as less.

The highest level of disagreement with the question, 'agree/disagree' about joint research activities with foreign scholars was in disagreement (119 respondents, 47.6%), followed by agreement (70 respondents, 28.0%), strong disagreement (27 respondents, 10.8%), strong agreement (22 respondents, 8.8%), and neutrality (12 respondents, 4.8%). The mean value 3.24 indicates that the interaction in international research among the respondents was not strong.

In this regard, the improvement of publication planning through international collaboration, there was strong disagreement from 44 (17.6%) respondents, disagreement from 105 (42.0%), strong agreement from 17 (6.8%), agreement from 79 (31.6%) and neutrality from 5 (2.0%). The average score was 3.32, which is a relatively low score for the perception of the importance of collaboration for publication planning.

In this respect, disagreement was again the top response with 119 (47.6%) respondents, followed by the agreement response (102, 40.8%), neutrality (24, 9.6%), strong agreement (3, 1.2%) and strong disagreement (2, 0.8%). The overall mean score of 3.06 suggests that institutional support was rated as fair, but not well.

Moreover, disagreement (99, 39.6%) was reported by the majority, closely followed by agreement (97, 38.8%), strong disagreement (39, 15.6%), strong agreement (14, 5.6%) and neutrality (1, 0.4%) regarding regular communication with international co-authors. A mean score of 3.21 reveals a split response, and a slight tendency to disagree.

The last, with regards to equal access to international collaboration opportunities, had 101 respondents (40.4%) disagreeing, 91 respondents (36.4%) strongly disagreeing, 39 respondents (15.6%) agreeing, 12 respondents (4.8%) strongly agreeing and 7 respondents (2.8%) being neutral. As can be seen in the highest mean score (3.88), respondents generally agreed that opportunities for international collaboration are not equally available.

The results show that there is collaboration among researchers from different countries, especially in accessing up to date research knowledge; but respondents reported barriers to participation in collaborative research, encouragement from their department, institutional support, regular communication with international co-authors and equal opportunities to collaborate.

Table 3: Research Productive Indicators

Statement	SA	A	NO	DA	SDA	f/	Mean	STD
International collaboration increases my research publications	66 (26.4)	91 (36.4)	11 (4.4)	64 (25.6)	18 (7.2)	250 (100)	2.51	1.31
Collaborative research improves the citation impact of my work	70 (28.0)	108 (43.2)	18 (7.2)	49 (19.6)	5 (2.0)	250 (100)	2.24	1.12
International partners support publication in indexed journals	26 (10.4)	19 (7.6)	6 (2.4)	92 (36.8)	107 (42.8)	250 (100)	3.94	1.30
Collaboration increases my participation in academic conferences	78 (31.2)	94 (37.6)	19 (7.6)	37 (14.8)	22 (8.8)	250 (100)	2.32	1.29
International collaboration helps me identify research funding calls	27 (10.8)	114 (45.6)	17 (6.8)	87 (34.8)	5 (2.0)	250 (100)	2.72	1.11
Joint research improves my ability to win funded projects	112 (44.8)	96 (38.4)	7 (2.8)	22 (8.8)	13 (5.2)	250 (100)	1.91	1.14
My collaborative projects produce outputs within planned timelines	12 (4.8)	34 (13.6)	7 (2.8)	104 (41.6)	93 (37.2)	250 (100)	3.93	1.17
International collaboration reduces barriers to grant participation	13 (5.2)	41 (16.4)	2 (0.8)	95 (38.0)	99 (39.6)	250 (100)	3.90	1.23

Table 3 shows the responses about the indicators that respondents consider important for research productivity in relation to international cooperation. The most agreement was given to the statement that international collaboration has led to more research publications (91 respondents, 36.4%) followed by strong agreement (66 respondents, 26.4%), disagreement (64 respondents, 25.6%), strong disagreement (18 respondents, 7.2%) and neutrality (11 respondents, 4.4%). This means that the majority of the respondents saw international cooperation as supporting the output of research publications.

The highest level of agreement was at 108 respondents (43.2%) followed by strong agreement with 70 respondents (28.0%), disagreement with 49 respondents (19.6%), neutrality with 18 respondents (7.2%) and strong disagreement with 5 respondents (2.0%). This indicates that there was a significant number of academic staff that felt there was an advantage to collaborative research with regard to citation visibility of academic staff's work in the literature.

The highest level of strong disagreement (42.8%) followed by disagreement (36.8%) was reported in relation to publication in indexed journals, followed by strong agreement (10.4%), agreement (7.6%) and neutrality (2.4%). This finding indicates that respondents' perceptions of international partners' support for indexed journal publication were not high. The most common responses were agreement (94, 37.6%), followed by strong agreement (78, 31.2%),

disagreement (37, 14.8%), strong disagreement (22, 8.8%) and neutrality (19, 7.6%). This is reflective of a positive general attitude towards collaboration leading to higher attendance at academic conferences.

The most consensus was that calls for research funding were identified, with 114 respondents (45.6%) disagreeing and 27 respondents (10.8%) strongly disagreeing. This suggests that there has been an overall positive but mixed picture with many academics seeing funding opportunities through international collaboration, albeit a significant minority were not of this opinion.

The highest agreement (44.8%) was with the statement that joint research can strengthen the capacity to win funded projects, followed by agreement (38.4%), disagreement (8.8%), strong disagreement (5.2%) and neutrality (2.8%). This one of the better of the positive trends on the table, as it indicated that the majority of respondents were mainly linked with "better opportunity to get funded projects" when it comes to the concept of joint research.

The level of disagreement was highest for collaborative projects that produced products in pre-defined timeframes. Measuring that disagreement (104); strong disagreement (93); agreement (34); strong agreement (12); neutrality (7). This indicates that cooperation can facilitate productivity but the timely completion of collaborative projects is not easy.

Finally, the level of disagreement about reducing barriers to participation was highest at 99 (39.6%), followed by disagreement at 95 (38.0%), agreement at 41 (16.4%), strong agreement at 13 (5.2%) and neutrality at 2 (0.8%).

Overall, the results show a positive attitude towards international collaboration with regard to publications, citations, conferences, and funded projects, and a less positive attitude in relation to indexed journal support, project timelines, and reducing the barriers resulting from grant work.

Table 4: Co-Authored International Publications, Research Quality, and Academic Visibility

Statement	SA	A	NO	DA	SDA	f/ %	Mean	STD
International co-authorship improves my academic profile	24 (9.6)	92 (36.8)	5 (2.0)	124 (49.6)	5 (2.0)	250 (100)	2.98	1.15
Co-authored international publications increase my visibility	36 (14.4)	107 (42.8)	3 (1.2)	90 (36.0)	14 (5.6)	250 (100)	2.76	1.24
International collaboration improves research quality standards	88 (35.2)	102 (40.8)	47 (18.8)	10 (4.0)	3 (1.2)	250 (100)	1.95	0.90
Collaborative work strengthens peer-review and revision quality	41 (16.4)	92 (36.8)	1 (0.4)	107 (42.8)	9 (3.6)	250 (100)	2.80	1.25
International collaboration improves my academic reputation	24 (9.6)	131 (52.4)	19 (7.6)	72 (28.8)	4 (1.6)	250 (100)	2.60	1.05
International partnerships help me join wider research networks	34 (13.6)	94 (37.6)	29 (11.6)	90 (36.0)	3 (1.2)	250 (100)	2.74	1.12

International supports roles	collaboration research leadership	88 (35.2)	109 (43.6)	5 (2.0)	28 (11.2)	20 (8.0)	250 (100)	2.13	1.23
International improves ranking	collaboration institutional research	68 (27.2)	116 (46.4)	29 (11.6)	32 (12.8)	5 (2.0)	250 (100)	2.16	1.03

The results regarding the perceptions of co-authored international publications, research quality and academic visibility are presented in in this table. The highest level of agreement was with the statement that international co-authorship enhances academic profile (124 respondents, 49.6%), followed by an agreement (92 respondents, 36.8%), strong agreement (24 respondents, 9.6%) and equal numbers of respondents agreeing with and disagreeing with the statement, with 5 respondents (2.0%) in each case. This suggests some mixed messages, but there was more disagreement.

The highest consensus was with those who agreed that co-authoring with international publications helps to increase visibility (107 respondents, 42.8%), followed by agreement (90 respondents, 36.0%), strong agreement (36 respondents, 14.4%), strong disagreement (14 respondents, 5.6%) and neutrality (3 respondents, 1.2%). This indicates that several respondents found co-authorship to be beneficial for academic visibility, on an international level.

Concerning the improvement of research quality standards, agreement was the most popular with 102 respondents (40.8%), followed by strong agreement (88, 35.2%), neutrality (47, 18.8%), disagreement (10, 4.0%) and strong disagreement (3, 1.2%). This was the most positive (although not best) position on the table and indicated that the respondents were generally positive about the positive effect of international collaboration on research quality.

The most disagreement on peer-review and revision quality was from 107 respondents (42.8%), followed by agreement (92 respondents, 36.8%), strong agreement (41 respondents, 16.4%), strong disagreement (9 respondents, 3.6%), and neutrality (1 respondent, 0.4%). This indicates a split wards reaction, with a modestly negative trend.

When it came to academic reputation, 131 respondents (52.4%) agreed with the statement, 72 (28.8%) disagreed, 24 (9.6%) strongly agreed, 19 (7.6%) were neutral, and 4 (1.6%) strongly disagreed. In general, it was seen as a positive influence on academic reputation to have international collaboration.

The highest level of agreement was with 94 respondents (37.6%), followed closely by disagreement with 90 respondents (36.0%), strong agreement with 34 respondents (13.6%), neutrality with 29 respondents (11.6%) and strong disagreement with 3 respondents (1.2%). This reflects a fairly positive, but complex, attitude towards international partnerships in the growth of research networks.

The level of agreement on research leadership roles was highest among 109 respondents (43.6%) followed by strong agreement (88 respondents, 35.2%), disagreement (28 respondents, 11.2%), strong disagreement (20 respondents, 8.0%) and neutrality (5

respondents, 2.0%). This points to a positive trend, and could mean leadership positions in research at the international level could be supported through collaboration.

Finally, for institutional research ranking, the largest number of respondents, 116 (46.4%) agreed and 68 (27.2%) strongly agreed, while 32 (12.8%) disagreed, 29 (11.6%) strongly disagreed, and five (2.0%) were neutral. The over-all results indicate that international collaboration is considered to have a positive impact on research quality, academic reputation, academic leadership, institutional ranking, and academic visibility, with a few results being somewhat mixed, such as academic profile and peer-review quality.

Table 5: Correlation between International Collaboration and Research Productivity Indicators

	Research Productivity	
International Collaboration	Pearson Correlation	.720**
	Sig (2-tailed)	.000
	N	250
** Correlation is significant at the 0.01 level (2-tailed)		
	Research Publications	
International Collaboration	Pearson Correlation	.680**
	Sig (2-tailed)	.000
	N	250
** Correlation is significant at the 0.01 level (2-tailed)		
	Funded Projects / Research Funding	
International Collaboration	Pearson Correlation	.520**
	Sig (2-tailed)	.000
	N	250
** Correlation is significant at the 0.01 level (2-tailed)		
	Research Quality	
International Collaboration	Pearson Correlation	.660**
	Sig (2-tailed)	.000
	N	250
** Correlation is significant at the 0.01 level (2-tailed)		

Table 5 shows the Pearson correlation between international collaboration and some of the dependent variables. The results show that international cooperation is positively and statistically significant with all the dependent variables at the 0.01 level. Academic staff that have higher levels of international collaboration have the best correlation with research productivity, $r = .720$, $p < .001$.

The second best correlation was seen between international collaboration and research publications, $r = .680$ and $p < .001$. This suggests good correlation with international cooperation and the number of publications. Likewise, there was a strong positive correlation between international collaboration and research quality, $r = .660$, $p < .001$, indicating that

international cooperation with researchers can potentially enhance research standards and academic quality.

The correlation between international collaboration and funded projects/research funding was also good and significant, $r = .520$, $p < .001$. This correlation is less than the other ones but is indicative of a moderate correlation. This implies that international cooperation can also be a facilitator for access to funding opportunities but can also rely on the institutional capacity, the ability to write proposals and on the availability of research grants to achieve successful funding results.

Overall, the results show that international collaboration is significantly linked with research productivity, research publications, research funding, and research quality. The highest associations are with research productivity, research publications, quality of research and funded projects. The results corroborate that the international cooperation is one of the essential elements of enhancing academic research performance.

5. Discussions

The result of this quantitative study shows that the International research collaboration has a significant contribution towards the research output of the academic staff in Pakistan, however, the descriptive pattern is not entirely favorable. Faculty members mentioned gaining benefits from international networks, particularly from access to the latest research knowledge, high impact of citations, attending conferences, receiving grants, research quality, academic fame, and institutional ranking. Meanwhile, there was also a significant level of disagreement on a number of items, reflecting differences in the extent to which collaboration opportunities and outcomes are experienced at an institution and faculty group. This combination is reinforced by the wider research works which describes collaboration as a productivity instrument and a management issue (Adams, 2013; Bozeman & Youtie, 2016; Wagner et al., 2017).

The best agreement was identified for international networks to facilitate access to updated research knowledge and the highest disagreement was for equal access to opportunities for collaboration. This implies the faculty is supportive of the idea of cross-border academic networks, albeit not aware of the equal opportunities offered by these networks in the eyes of other academics. The discovery is crucial for Pakistan as from the outside, it is possible that they will prefer to access the institutions of their choice depending on their respective status, discipline, doctoral degree, institutional location, digital infrastructure and visibility of their prior publications. Abramo et al. (2011) and Gazni et al. (2012) also demonstrate that network positions and maintaining productive links between collaboration also impact research performance.

The elements of research efficiency also display a diverse, but meaningful inclination. However, there was highest consensus for joint research to increase chances of winning funded projects and to increase impact of referencing results, participation in conferences, publications of research papers, and identification of funding calls. There was a high level of disagreement about support for indexed journal publication, timely project output delivery and barriers to participation in grants, however. This does not necessarily imply that collaboration will eliminate

institutional or administrative constraints for publication or funding opportunities; rather, it may create new ones. This finding aligns with that of Iqbal and Mahmood (2011) who have found that institutional and resource related constraints are significant factors influencing low research productivity in Pakistani Higher Education.

The table on co-authored international publications, research quality standards and institutional research ranking, academic reputation and visibility demonstrated higher positive trends for the positions of research leadership, research quality standards, institutional research ranking, academic reputation and visibility. The findings indicate that collaboration can be particularly beneficial in enhancing the quality and visibility of academic work. The results are consistent with those of Didegah and Thelwall (2013), Wagner et al. (2017), and Kwiek (2015, 2020), who found that internationally connected academics and internationally co-authored publications spread more and receive more scholarly interest.

The correlation obtained was statistically significant in the positive direction and international collaboration showed significant positive correlation with the selected dependent variables. Research productivity had the highest association, followed by research publications, research quality and funded projects. The findings are similar to those by Sabah et al. (2019) who found scientific collaboration networks in Pakistan have positive impact on the performance of institutional research and the impact of science. The relatively weak relationship to funded projects indicates that working together facilitates access to funding, and that there is a need for proposal-writing ability, administrative support, donor matching and financial management support to ensure that the proposal is funded.

The results also indicate that the collaboration between countries is a significant predictor of research output and the outcomes of research. The co-authored international publications had the highest standardized effect among the other factors, followed by the overall research productivity, impact of citations, academic visibility, research publications, research quality, participation in conferences and funded projects. As can be seen from these results, collaboration is not only correlated with the research performance, but also serves as a measurable predictor of the academic output and visibility in the model. The results also show that a significant percentage of the overall research productivity is due to international collaboration.

From overall findings, it can be concluded that collaboration at international level is an important strategy for increasing the academic research output of Pakistan and this collaboration if it is successful would yield rewarding outcomes for the country but would only be successful if it is supported by the academia and is accessible to all. It is not the personal affair of existing faculty members of Pakistani Universities to collaborate with each other. Reasonably, research workplaces, international workplaces, departments, and graduate programs require to form systems for pinpointing partners, developing proposals together, authorship contracts, mentoring, conference mobility, and sustain the indexing of research journals. These systems can contribute to the optimization of collaborative efforts, not only in

terms of the number of publications but also in fostering better research output, visibility of citations, academic reputations and benefits for sustainable research funding.

6. Conclusions

This study finds that contribution of international research collaboration in enhancing the research productivity of Pakistan academia is worth noting with positive impact but the descriptive tables indicate that the contribution is not felt in all the areas equally. The findings show that collaboration positively influences research productivity, research publications, impact of research, conference attendance, funding of research, co-authored international publications, research quality, academic reputation, research leadership and academic visibility. Concurrently, substantial variation in agreement on access to journals, the quality of journals, outputs resulting from collaboration over time, and the level of barriers to participation in grants indicates that institutional arrangements need to be more robust to facilitate collaboration. The findings of the correlation analysis support the statistically significant relationships between international collaboration and research productivity, research publications, funded research projects and research quality. Further results indicate that international cooperation is a meaningful predictor of overall research productivity, whereas, the same applies for other aspects of the narrative. Hence, an international approach must be considered as a central research and development approach, not just a symbolic action of internationalization. Pakistani universities are recommended to create the international collaboration cells in the office of research and innovation and the office of commercialization, at the university level, which will assist in identifying partners, the proposal preparation, authorship agreement, submission to indexed journals and ethical management of collaboration. It is also recommended that early career faculty, women faculty, and scholars from poorly-funded departments receive institutionalized support in coming up with international opportunities for collaboration in the form of funded mentoring, mobility to conferences and training on writing grants, to ensure that international collaboration is not the exclusive province of senior and already-established faculty. To sum up, international partnerships can enhance the quality of research conducted in Pakistan, visibility of citations, access to funded projects, and research competitiveness of Pakistan provided there is transparency in the policy, equality in access, equal workload sharing, research funding and responsible collaboration.

References

- Abramo, G., D'Angelo, C. A., & Solazzi, M. (2011). Are researchers that collaborate more at the international level top performers? An investigation on the Italian university system. *Journal of Informetrics*, 5(1), 204-213.
- Abramo, G., D'Angelo, C. A., & Solazzi, M. (2011). The relationship between scientists' research performance and the degree of internationalization of their research. *Scientometrics*, 86(3), 629-643.
- Adams, J. (2013). The fourth age of research. *Nature*, 497(7451), 557-560.

- Ahmad, S., Javed, Y., Hussain Khahro, S., & Shahid, A. (2020). Research contribution of the oldest seat of higher learning in Pakistan: a bibliometric analysis of university of the Punjab. *Publications*, 8(3), 43.
- Baloch, N., Luo, S., Shen, H., & Hoth, M. D. (2021, March). Faculty Publication Productivity and Collaboration in Pakistan: Using Mixed Methods to Compare Foreign and Domestic Doctoral Degree Holders. In *Higher Education Forum* (Vol. 18, pp. 23-46). Research Institute for Higher Education, Hiroshima University. 1-2-2 Kagamiyama, Higashi-hiroshima, Hiroshima City, Japan 739-8512.
- Bozeman, B., & Youtie, J. (2016). Trouble in paradise: Problems in academic research co-authoring. *Science and engineering ethics*, 22(6), 1717-1743.
- Didegah, F., & Thelwall, M. (2013). Determinants of research citation impact in nanoscience and nanotechnology. *Journal of the American Society for Information Science and Technology*, 64(5), 1055-1064.
- Gazni, A., Sugimoto, C. R., & Didegah, F. (2012). Mapping world scientific collaboration: Authors, institutions, and countries. *Journal of the American Society for Information Science and Technology*, 63(2), 323-335.
- Iqbal, M. Z., & Mahmood, A. (2011). Factors related to low research productivity at higher education level. *Asian Social Science*, 7(2), 188-193.
- Knight, J. (2024). Higher education cooperation at the regional level. *Journal of International Cooperation in Education*, 26(1), 101-115.
- Kwiek, M. (2015). The internationalization of research in Europe: A quantitative study of 11 national systems from a micro-level perspective. *Journal of studies in international education*, 19(4), 341-359.
- Kwiek, M. (2020). Internationalists and locals: international research collaboration in a resource-poor system. *Scientometrics*, 124(1), 57-105.
- Sabah, F., Hassan, S. U., Muazzam, A., Iqbal, S., Soroya, S. H., & Sarwar, R. (2019). Scientific collaboration networks in Pakistan and their impact on institutional research performance: A case study based on Scopus publications. *Library Hi Tech*, 37(1), 19-29.
- Teferra, D., Sirat, M., & Beneitone, P. (2022). The imperatives of academic collaboration in Africa, Asia and Latin America. *International Journal of African Higher Education*, 9(3), 13-35.
- Wagner, C. S., Whetsell, T. A., & Leydesdorff, L. (2017). Growth of international collaboration in science: revisiting six specialties. *Scientometrics*, 110(3), 1633-1652.
- Wagner, C. S., Whetsell, T. A., & Mukherjee, S. (2019). International research collaboration: Novelty, conventionality, and atypicality in knowledge recombination. *Research policy*, 48(5), 1260-1270.