

Research Performance of Higher Education Institutions: A Review on the Measurements and Affecting Factors of Research Performance

Yükseköğretim Kurumlarında Araştırma Performansı: Ölçüm Kriterleri ve Kavramı Etkileyen Faktörler Üzerine Bir İnceleme

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ABSTRACT

Recently, the increasing competition in higher education has attracted attention by many researchers. They have emphasized that the aim of the growing competition between universities is to increase the number of students, the research performance and get research support, find qualified faculty members, and receive financial contributions. This paper aims to draw attention to “research performance” which is a significant part of the competition among the universities. In connection with this goal, the study tries to outline the results of an extensive literature review in the field of higher education research performance. Firstly, literature regarding research performance, its definition as a concept, and its indicators are discussed. Then, the factors influencing research performance are presented in a comprehensive manner. At the end of the study, a conceptual framework that will be useful for all university staff is provided. Understanding the concept of research performance and the factors affecting research performance can help relevant authorities improve their current positions.

Keywords: Higher education, Research performance, Measurements, Factors, Conceptual framework

ÖZ

Yükseköğretim alanında artan rekabet son yıllarda birçok akademisyenin ilgi odağı haline gelmiştir. Konu ile ilgili yapılan araştırmalar, bu rekabetin özellikle, öğrenci sayısı ve araştırma performansını artırma, araştırma fonu elde etme, nitelikli öğretim görevlileri bulma ve kurum için elde edilebilecek finansal destekler üzerine olduğunu vurgulamıştır. Bu çalışmada üniversiteler arasındaki rekabetin önemli bir parçası olan ‘araştırma performansı’ konusuna dikkat çekilmiş ve kavrama yönelik geniş bir literatür taraması yapılmıştır. İlgili yazın, ilk olarak, kavramı açıklayan tanımlamalar ve kavramın ölçütleriyle birlikte ortaya konulmuş; ardından, araştırma performansını etkileyen faktörler kapsamlı bir şekilde ele alınmıştır. Çalışmanın sonunda ise ‘araştırma performansı’ ile ilgili kavramsal bir çerçeve elde edilmiştir. Elde edilen bu kavramsal çerçevenin, üniversiteler arası rekabetin önemli bir parçası olan ‘araştırma performansı’ kavramının her yönüyle anlaşılmasına ve böylelikle konuyla ilgili olan tüm yetkililerin mevcut durumlarını daha iyi hale getirebilmesine katkı sağlaması beklenmektedir.

Anahtar Sözcükler: Yükseköğretim, Araştırma performansı, Ölçümler, Faktörler, Kavramsal çerçeve

INTRODUCTION

The academic roles of higher education institutions comprise three major components: teaching, research, and service (Edgar & Gear, 2013; Jauch & Glueck, 1975). In this study, the

concept of research performance is examined in a broad perspective. The concept of research performance comprises two basic components: research and performance. Research can be defined as an important academic activity and any faculty member is expected to engage in it (Hedjazi & Behravan, 2011).

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Performance related to research can be defined as the quality of a paper that allows knowledge gained through the research to be visible and passed on (performed) to others (Bazeley, 2010). To date, no common agreement exists among writers on a specific term to be used in describing academic research. In past studies, researchers use the terms “scientific research” (Mairesse & Turner, 2005), “scientific productivity” (Andrews & Aichholzer, 1979; Bazeley, 2010; Folger et al., 1970), “research performance” (Jauch & Glueck, 1975; Wood, 1990), “research output” (Jauch & Glueck, 1975), and “research activities” (Bowden et al., 2005). Specifically, the concept of research performance refers to the act of submitting an article for publication in an academic or professional journal; publishing an article in an academic or professional journal; publishing or editing, individually or in collaboration, a book or monograph; publishing a book review; or delivering a paper at a professional meeting (Pellino, Blackburn, & Boberg, 1984). To ensure consistency, the terms “research productivity” and “research performance” are used interchangeably in the current study as “performance” or “productivity” implies a high level of output (Creswell, 1985). When the literature is examined, a growing emphasis on research productivity has been observed in recent years. In terms of academics, while research productivity can be considered a key factor in academic career promotion, for universities, it is a key factor in obtaining research funding and gaining a higher position in the competitive environment of higher education. Therefore, understanding the concept of research performance and the factors that influence it can lead to a better position for universities in their country and also all over the world. In the study, this concept is explained along with measurements and the factors influencing such performance are identified. Therefore, the paper has generated a framework that identifies this important concept, dependently the litterateur syntheses. Such information can help academics increase their own research performance and enable university managers to develop and improve their institutional research performance.

RESEARCH PERFORMANCE

Measurements of Research Performance

A review of the literature shows that there are different types of measurements for explaining the concept of research performance (Brew, 2001). For example, research effectiveness can be measured by simply counting the number of publications in respectable journals (Jauch, & Glueck, 1975). In their research, 10 criteria are used to evaluate research performance, namely, journal quality index, peer and colleague evaluations, citation indexes, number of honors and awards, number of papers presented in meetings, number of dissertations, publications (books and articles), invitations to present papers, success in obtaining research grant funding, and positions held in professional associations. Creswell (1985) emphasized that data-based studies of science and social science faculty use three common measures, namely, publication counts, citation counts, and peer-colleague ratings. Harris (1990) used four related but different measurements for explaining and evaluating research performance, which include impact, qual-

ity, importance, and quantity. Impact is defined as a measure of the influence of a research and is evaluated by using the number of citations made to it by other scholars. Importance and quality are defined as expert value judgments, which are typically delivered via peer reviews. Among the four, quantity is the simplest of all measures; it concerns the number of publications or pages produced. According to Harris, a strong correlation exists between impact and quantity.

Blackburn et al. (1991) used three levels in explaining research performance. The first is *Level 1* (clear products) and has to do with one's research productivity. *Level 1* consists of a seven-item scale, which includes the following: submitted an article for publication in an academic or professional journal; published chapters in a book; submitted a research proposal to a governmental or private agency; written a research report for an agency, institutions, or other group; scholarly articles published; external grant proposals submitted; and professional writings published or accepted for publication. The second is *Level 2* (non-published products), which consists of two items: how often the subject presented his/her ongoing work on campus during the last year, and how often during the last two years he/she has made a presentation at a professional conference. The third is called *Level 3* (collegial conversations regarding research), which consists of a scale with two items: how often the subject has had informal conversations with colleagues about research at professional meetings and how often the subject has had telephone conversations with colleagues to discuss his/her scholarly works. Ramsden and Moses (1992) proposed two indicators of individual research performance. The first indicator is an index of research productivity, which is defined as the five-year sum of the number of single or multi-author books published, the number of papers published in refereed journals, the number of edited books, and the number of chapters in refereed books. The second indicator, an index of research activities, includes the following criteria: received an external, competitive research grant; received an internal, competitive research grant; supervised one or more honors/masters students; supervised one or more PhD students; had informal discussions with departmental colleagues about common research interests; participated in one or more joint research projects with colleagues; served as an editor or became part of the editorial board of an academic journal; reviewed one or more proposals for a funding agency; refereed one or more articles for a journal; delivered one or more conference papers in a research area; and maintained professional contact with colleagues overseas.

Meanwhile, Dundar, and Lewis (1998) described research productivity as a dependent variable that can be largely measured by journal publications; they reported that this output measure is functionally related to those individual faculty and organizational attributes. Zainab (1999) identified research performance as reporting and publishing research findings in international and domestic journals, conference presentations, patent registration, impact factors, and reviews. Teodorescu (2000) stated that research productivity can be measured as publication counts and defined as the self-reported number

of journal articles and chapters in academic books that the respondent has published in the three years prior to the survey. According to Ransdell (2001), research performance includes field journal papers, book chapters, and refereed publications in a library. Turner, and Mairesse (2005) measured the determinants of researchers' productivity using three dimensions: in terms of the annual number of publications per scientist, the average impact factor of the journals where each publication appeared per scientist annually, and the average number of annual citations per article for each scientist. Bazeley (2010) stated that conventional measures of research performance are based on publication output, citations as a measure of impact, other assessments of work quality (e.g., by expert panels in the UK), and, in some systems, indicators of the reputation of researchers. Hesli, and Lee (2011) determined the criteria as follows: number of articles published in refereed academic or professional journals, number of monographs (books) published, number of books edited, and number of published book chapters.

In summary, the related literature generally emphasizes that research productivity refers to the research output produced by academics and is commonly measured as the total number of publications by a researcher, usually adjusted for quality (Wills, Ridley, & Mitev, 2013). The most popular criterion is to measure research productivity through the number of publications (Burke, Fender, & Taylor, 2007), the number of publications weighted by publication rating (Buchheit, Collins, & Collins, 2001) and citation counts as a measure of research success (Chow & Harrison, 1998). Furthermore, according to Bazeley (2010), research performance occurs within conditions provided by an institutional context (education and training, opportunity and resources), to bring about a range of outcomes (product, impact, and reputation). Tekneci (2014) said that research evaluation studies use different instruments and indicators depending on the aim of the study. In these studies, the peer review and bibliometric analyses are the most frequently used instruments; the academic publications, graduate students, projects realized by external funds, and entrepreneurial activities are among the most frequently used indicators for research performance. At the end of the review of literature, a framework that identifies research performance measurements is obtained. These measurements can be seen in Table 1.

Factors Affecting Research Performance

Many studies (Clark, & Lewis, 1985; Golden et al., 1986; Graves, Marchand, & Thompson, 1982; Johns, 1988; Levin, & Stephan, 1989; Long, 1978; Meador, Walters, & Jordan, 1992; Olson, 1994) have examined factors influencing the research performance of universities and academics. Numerous studies on faculty research productivity have identified a consistent set of facilitating characteristics that have an impact on faculty research productivity. Wamala and Ssembatya (2015), for example, stated that productivity in the academe is consensually regarded as an indicator of research activity conducted by individuals, institutions, countries, and regions as a whole. Some researchers have grouped these characteristics into

Table 1: Research Performance Measurements

No	Measurements of Research Performance
1	Number of articles published in refereed or professional journals
2	The impact factor of the journals
3	Number of published books
4	Number of edited books
5	Number of published chapters in refereed books
6	Number of edited chapters in refereed books
7	Number of citations
8	Citations as a measure of impact
9	Patent registration
10	Received research grant
11	Participated in research projects
12	Number of honors and awards
13	Number of papers presented in meetings or conference
14	Number of invitations to present papers
15	Number of supervised dissertations
16	Supervised one or more honors/masters students
17	Supervised one or more PhD students
18	Served as an editor of an academic journal
19	Positions held in professional association
20	Maintained professional contact with colleagues overseas

clusters or models to understand the major factors affecting research productivity, with the aim of designing a model that explains faculty research productivity.

Finkelstein (1984) suggested seven critical variables that predict faculty publication rates, namely, faculty researchers with a research orientation, the highest terminal degree within a field, early publication habits, previous publication activities, communication with disciplinary colleagues, subscriptions to a large number of journals, and sufficient time allocated to research. Creswell (1985) described successful researchers as those who tend to hold a senior professorial rank, spend at least one-thirds of their time on research activities, publish early in their careers, receive positive feedback from peers for their research efforts, as well as maintain regular and close contact with colleagues on and off campus who conduct research on similar topics. Creswell's (1985) model acknowledges the impact of an institution and the research culture within such an institution on an individual faculty's research productivity. Astin (1984) noted this shortcoming and stated that "Researchers have usually looked at the following factors as potential predictors or independent variables: (1) gender, (2) marital status, (3) age, (4) field of specialization, (5) educational

experience and characteristic of the graduate institution, (6) characteristics of the employer institution” (263). Jordan and his colleagues (1988, 1989) examined the effects of the type of organizational influence and control (i.e., public or private) on departmental research productivity, and found strong evidence indicating that private institutions are associated with greater academic research productivity. However, in a reanalysis of the same data set, Golden and Carstensen (1992) reported that the effect of institutional control declines after controlling for both research support and the department’s reputational rating. They argued that this finding is consistent with the view that departments in private institutions emphasize research over teaching and service activities, whereas departments in public universities give greater emphases on teaching, public service, and outreach. Specifically, they state that private institutions may not be more efficient in their resource use than are public universities; the latter may produce more teaching and service outputs per faculty member, provide fewer support facilities and pay lower salaries.

Wood (1990) reported the views of academic staff from one Australian university on such issues as the determinants of research performance; the same author also highlighted the importance of individual autonomy in the selection of research topics. In that study, the determinants of research performance are explained under ten items, including personal characteristics, such as ability, creativity, motivation, self-discipline and ambition; research area; funds/equipment/support staff; colleagues and work environment; postgraduate training department and its work environment; number of PhD students; teaching and administrative demands; tenure; and other factors, such as institutional expectations regarding research performance or promotion. That study also emphasized the importance of individual autonomy in selecting research topics to increase research performance.

According to Fox (1991a), faculty work is a highly social enterprise and depends a great deal on interactions with one’s environment. The productivity of academics is greatly affected by several elements in their external environments (Blackburn, Behymer, & Hall, 1978; Bland et al., 1987, 2002; Long, & McGinnis, 1981; McGee, & Ford, 1987; Perkoff, 1985), such as the administrative structure, the productivity of colleagues, the availability of resources, and the organizational culture and structure. Blackburn et al., (1991) examined the factors of gender, (socio-demographic), quality of graduate school attended, career age, and rank (career); self-competence and self-efficacy regarding research, scholarship, and service and percentage of time given to the research, scholarship, and service (self-valuations); and institutional preference, consensus and support, and colleague commitment to research, scholarship, and service (perception of the environment) on research performance. Fox’s theory (1991b) proposed that individual and environmental factors combine to produce high research output. Bland and Ruffin (1992) examined the characteristic of a productive research environment with a literature review method. The results of their review revealed that a consistent set of 12 characteristics can be found in research-conductive environments. These characteristics are as follows:

(1) clear goals that serve a coordinating function, (2) research emphasis, (3) distinctive culture, (4) positive group climate, (5) assertive participative governance, (6) decentralized organization, (7) frequent communication, (8) accessible resources particularly human, (9) sufficient size, age, and diversity of the research group, (10) appropriate rewards, (11) concentration on recruitment and selection, and (12) leadership with research expertise and skills in initiating appropriate organizational structure and using participative management practices (p. 385).

Ramsden (1994) stated that the combination of structural factors (e.g., how academic departments are managed and led) with personal variables (e.g., intrinsic interest in the subject matter of one’s discipline) determine levels of productivity. Harris and Kaine (1994) examined economists’ opinions on research performance and found that higher performance levels are associated with a stronger career orientation in the research undertaken, a stronger motivation to conduct research, a higher degree of interaction with other economists, and a work environment that is conducive to research. Kyvik and Smeby (1994) examined the relationship between the supervision of graduate students and university faculty research performance and found that the supervision of PhD students who have projects related to their supervisor’s research has an independent effect on faculty members’ scientific productivity. Kyvik (1995) identified several arguments in favor of the role of a larger departmental size in increasing research productivity. He argued that larger departments can better facilitate collaborative research groups. In such departments, there are more likely to be several faculty members with similar research interests, which may increase cooperation and collaboration for joint research products. Thus, increased research performance is an outcome of heightened interactions among academics. He called this “intellectual synergy.”

Dundar and Lewis (1998) proposed a model with two basic attributes, namely, (i) individual and (ii) institutional and departmental attributes. Individual attributes include innate abilities (e.g., IQ, personality, gender, and age) and personal environmental influences (e.g., the quality and culture of graduate training, and culture of employing department). Institutional attributes include institutional structure and leadership, size of program and faculty, control by private, amount of university revenue, availability of technology and computing facilities, number of books and journals in library. Finally, departmental attributes include departmental culture and working conditions, such as workload policies; availability of leaves, travel, and institutional funds for research; number of students on research support; availability of “star faculty;” and availability of nongovernmental research funds. Teodorescu (2000) also stated a model about research performance. His model asserted that individual achievement variables and institutional variables can predict faculty research productivity across national boundaries. Brocato (2001) proposed that faculty research productivity in the context of medical school family practice departments is related primarily to the broad factors of early research socialization, psychological and demo-

graphic characteristics of individual faculty members, and the institutional and departmental research environments. He also found that the characteristics of individual faculty members, such as motivation, professional networks, and research training, are highly correlated to research productivity. Further, institutional, departmental, and disciplinary characteristics have a much lower impact on faculty research productivity, especially in relation to the characteristics of individual faculty members.

Meanwhile, Bland, and colleagues (2002) reviewed the literature on university research productivity and proposed a model, which showed that high research productivity is strongly related to 12 individual, 13 institutional, and 3 leadership characteristics. Individual characteristics, such as motivation, socialization, competence in their content areas, competence in research and teaching skills, having a network of productive colleagues, and having a mentor, all have a positive association with high academic productivity and satisfaction. Institutional characteristics include clear goals that serve a coordinating function, research and teaching emphasis, a culture that embraces the values of the academe, a positive group climate, decentralized organization, frequent communication among peers, sufficient and accessible resources, a critical mass of faculty who have been together for a while and bring a mix of different perspectives (size, age, diversity), adequate and fair salaries and other rewards, targeted recruitment and selection, as well as seasoned and participatory academic leadership. In comparison, leadership characteristics include the following: highly regarded, academically capable, research-teaching oriented, and attends to individual and institution characteristics that facilitates productivity.

Bland and colleagues (2005) also applied a questionnaire that is related to the theoretical clusters determined in their earlier model (Bland et al., 2002). According to this study, research productivity is influenced by the interactions among the three broad groupings; further, it refers to the dynamic interplay of individual and institutional characteristics, supplemented by effective leadership, which eventually determines the productivity of individuals and departments. Bowden et al. (2005) attempted to understand the reasons behind the success in research activities of some academics. In doing so, they defined five categories, examined the relationships among these categories, and obtained a final relational structure for the five categories describing success in research. Their categories are presented as satisfaction category (a research is successful if the researcher finds the activity satisfying or exciting), management category (a research is successful if the researcher feels satisfied with having steered the project through some or all of the complex management steps), development category (a research is successful if it results in the development of the researchers and their organizations, such development includes learning new techniques and methods, inducting novices into the research process, assisting new researchers to complete higher degrees, developing constructive links with stakeholders, feeding outcomes back into teaching, and increasing the capability of the organization), publication

category (a research is successful if it results in some form of publication, such as a book, a journal article or a conference paper), usefulness category (a research is successful if it makes a difference to the world either by affecting other people's lives or by producing something new). Conklin and Desselle (2006) defined research productivity as the number of original research and review publications submitted to and accepted in peer reviewed journals. Fabel, Hein, and Hofmeister (2008) stated that individual research productivity, and consequently, departmental research productivity, is affected by institutional and personal characteristics.

Bazeley (2010) determined the factors as having two basic components, with six secondary level dimensions and a range of potential indicators. The four essential dimensions (all of which are necessary) related to the research activity component of research performance include engagement, task orientation, research practice, and intellectual processes. The two alternative dimensions (at least one of which is necessary) related to the performance or are responsible for making research a visible component of research performance are dissemination and collegial engagement. In that study, the dimensions of success research performance are explained in terms of the following six items: (i) engagement is expressed as interest and involvement, without engagement, research simply does not occur, (ii) task orientation is also expressed as disciplined management and getting the job done, the duty of conducting research necessitates commitment and persistence to the point of completion, (iii) research practice can also be expressed as knowledge and skills that are substantively and methodologically sound, the researcher has a deep understanding of the substantive topic being researched and technically skilled, and the research work features methodologically appropriate techniques, (iv) intellectual processes also express analytic capacity and creative thinking, research is essentially an intellectual activity that requires a high level of interpretive and analytic capacity; it also requires a mind that is open to new and different ways of seeing things, (v) dissemination is expressed as a formal communication of research outcomes, research should be made visible so that others can benefit from it, (vi) collegial engagement is also expressed as the act of sharing knowledge and expertise, sharing one's expertise with one's peers or in a leadership or supervisory capacity is an additional way of passing on research knowledge.

The study of Hedjazi and Behravan (2011), based on the model of Bland et al. (2005), examined individual, institutional, and demographic characteristics that influenced research productivity among faculty members of an agriculture department in Tehran Province. The results indicate that several factors have meaningful relationships with the faculty members' research productivity, including age, academic rank, university of graduation, department type, creativity, self-confidence, working habits, research objectives, corporate management style, counseling system, network of communication with colleagues, research opportunities, experience and skill, research-orientation, and sources of facilities in the organization. The regression that aimed to predict research productivity contains

two demographic characteristics (academic rank and age), three individual characteristics (working habits, creativity and autonomy and commitment), and four institutional characteristics (network of communication with colleagues, sources of facilities, corporate management and research objectives). The research productivity of faculty members seems to be primarily associated with demographic and institutional variables rather than with individual variables. Wills, Ridley, and Mitev (2013), investigated the factors that may have an impact on the research productivity of accounting academics, and determined how the factors were related. They then proposed a model, which shows that government-level themes can influence institutional- and individual level-themes. Three themes that operated at an institutional level have been identified, namely, institutional characteristics, conflicting commitments, and extrinsic motivation. Three themes that operated at an individual level have also been identified, including skills/knowledge and other individual characteristics, intrinsic motivation, and politics of research. In the model, these identified items are called "Life-Cycle Forces". Hesli and Lee (2011) used the following six variables for explaining factors that affect research productivity: demographics (race, age and gender), family-related factors (marital status, having dependent children, number of children), human capital (PhD program ranking and quality, years to complete the degree, dissertation subfield), opportunity costs (teaching and service workload), working environment (private or public institution, MA- or PhD-granting institution, quality, prestige, rank of department, resources), and professional variables (faculty rank, subfield specialization, frequency of conference presentation, current employment school ranking, research experience, collaboration with other, attitudinal).

Jung (2012) summarized the factors into four major themes, namely, individual attributes, previous experience (training, reputation of doctoral program, and post-doctoral experience), institutional characteristics, and discipline area. According to Jung (2012), individual characteristics included gender and years of experience; workload included time spent teaching, time spent conducting research and instruction time for doctoral programs; research style included research preference, collaboration, applied and multi-disciplinary research; and institutional characteristics included performance-based management, commercial orientation, and shared governance. Jung (2012) also reported that research productivity is highly variable and influenced by a number of factors, including personal characteristics, workload, differences in research styles, and institutional characteristics. In another study, Jung (2014) reported the following factors influencing research productivity: individual characteristics, including demographic status and previous educational experience; academic origins, such as discipline and institutional mission; and organizational environment, such as organizational culture, personnel, or funding policy.

Edgar and Geare (2013) extended our understanding of research productivity by examining features of managerial practice and culture within university departments. They

interpreted their results by using two research performance groups, namely, high- and low-research performance groups. The first set of potentially influential factors, which are related to managerial practice, is divided into three sub-sections. Two of these sub-sections related to the individual as the unit of analysis and examined the extent to which a range of managerial practices and job factors are perceived by participants to influence actual performance, while the third one is related to the department as the unit of analysis, and looks at the extent to which a range of managerial practices are operationalized within the departments. The individual unit of analysis shows the importance of autonomy and recognition. At the individual level, there seems to be a consensus among the high- and low-performance groups that autonomy and recognition are important managerial practices related to performance. A statistically significant difference exists in the respondents' views about "belonging to a research team," that is, it is considered a relatively influential factor for the low group but not for the high group. A similar difference is also found for "satisfaction with the performance appraisal process." While this practice is considered by both groups to be one of the least influential, it is especially considered unimportant by the high-performance group. In the individual-level analysis, the strongest support from both the high- and the low- performance groups is afforded to the factors of "time," "motivation," and "personal competence" as well as "personal confidence," but relatively less weight is given to "leadership." In the department-level analysis, autonomy has been found to be a defining and significant feature, with the high-performance group particularly providing strong support for the operationalization of practices related to this concept. For the statements "sufficient authority to fulfill research responsibilities" and "sufficient freedom to do research," a reasonably high level of disparity exists, with the high-performance group reporting much higher levels of operationalized practice than the low-performance group. In assessing culture, the research found statistically significant differences for the characteristics of the following items: an emphasis on quality, a good reputation, achievement orientation, fairness, extent to which norms and values are perceived to be shared, and department members share the same research goals and willingly work towards the achievement of such goals. The high-performance group endorsed these six items as a feature of their work environment much more than the respondents belonging to the low-performance group. Wamala and Ssembatya (2015) indicated that the low scholarly productivity of the academe in the developing countries can be particularly attributed to several factors. Some of these include heavy workload (teaching and supervisory) owing to increasing student enrollments that are not matched by a commensurate expansion of faculty (Tettey, 2008, 2010), work and/or research environments that are not conducive for conducting research, limited collaborative efforts particularly in the art disciplines, and lack of leadership (Mugimu, Nakabugo, & Rwakishaya, 2009). Quimbo, and Sulabo (2014) proposed three categories of factors that influence research performance, namely, individual factors, institutional factors, and research self-efficacy. They stated that individual factors include personal charac-

CONCLUSION

teristics of faculty members such as age, gender, civil status, educational attainment, academic rank, field of specialization, teaching load, number of years in teaching, and research experience. In addition to that institutional factors refer to the existence of research policy, research funding, and research benefits and incentives adopted and implemented by the SU that serve as support mechanisms for research of faculty members. Research self-efficacy is the self-rating of the faculty member on his/her ability to succeed in conducting or engaging in a research activity.

Overall, with the aim of understanding the affecting factors of research performance, these factors are classified into groups or models by different researchers as mentioned above dependently the relevant literature. At the end of the litterateur syntheses, the following table is generated as a framework that identifies influencing factors of higher education research performance. These factors can be seen in Table 2.

In this article, by means of a literature review, the concept of research performance was presented, along with measurements and factors that influence such performance. Dependently the literature syntheses, a total of 20 variables were identified as measures of academic research performance. As outlined in this article, research productivity is influenced by several factors, which are basically classified into two groups, namely, external and internal factors. External factors include institutional attributes, such as institutional structure and offered opportunities, whereas internal factors include individual attributes and demographic variables as can be seen in Table 1. Based on the relevant literature, we determined 51 factors (27 internal factors and 24 external factors) that are highly correlated to research productivity. Finally, these factors are presented in Table 2, which is divided into two parts, namely, a. Individual variables, and b. External variables. This framework demonstrates research performance as an output

Table 2: Factors Affecting Research Performance

Individual variables			External variables		
Demographic variables	1	Gender	The features of institutional structure	1	Type of institutions (private or public)
	2	Age		2	Department size
	3	Tenure		3	Positive group climate
	4	Academic rank		4	Assertive participative governance
	5	Race		5	Decentralized organization
	6	Marital status		6	Frequent communication
	7	Number of children		7	Leadership characteristics
Personal attributes	1	Personal competence		8	Departmental culture supporting research
	2	Personal confidence		9	Give positive feedback for research efforts
	3	To fulfil research responsibilities		10	Colleagues and work environment
	4	Analytic capacity		11	Teaching and administrative demands
	5	Creative thinking		12	Institutional expectations regarding research
	6	Motivation	The opportunities offered by the institution	1	Amount of university revenue for research
	7	Ambition		2	Availability of equipment, technological facilities
	8	Engagement as interest and involvement of research		3	Number of books and journals in university library
	9	Working habits		4	Availability of leaves, travel, and institutional funds
	10	Having a research orientation		5	Availability of nongovernmental research funds
	11	Graduated Ph.D. program ranking and quality		6	To provide research training
	12	Years to complete the degree		7	To provide a network between colleagues
	13	Dissertation subfield		8	To provide adequate and fair salaries
	14	Research area		9	To give promotion and other rewards
	15	Previous publication activity		10	To provide sufficient time allocated to research
	16	Communication with colleagues		11	Suitable workload policies
	17	Belonging to a research team		12	To provide sufficient freedom to do research
	18	Number of supervised PhD students			
	19	Subscriptions to a large number of journals			
	20	Task orientation as disciplined management			

that can be explained by 20 variables obtained from the literature, which are based on 51 internal and external factors. This study identifies variables that can help higher education institutions and the academics themselves understand the concept of research performance and the factors that affect such performance. These findings will support academics and university managers better understand the concept of research performance and find ways to improve it. Therefore, the article presents a theoretical basis for future quantitative studies. Further research can examine these identified measurements and factors as well as investigate the relationship between factors and research performance among academics thus helping identify the main reasons behind the poor position of universities' research performance.

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