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ORIGINAL PAPER

Faculty research productivity in six Arab countries

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Abstract This article analyses the research output of a sample of higher education institutions (HEIs) in six Arab countries in order to start quantifying academic research productivity in the wider region of the Middle East and North Africa (MENA). A questionnaire classifying HEIs was administered to 310 institutions in Lebanon, Qatar, the United Arab Emirates (UAE), Morocco, Saudi Arabia and Jordan. The study revealed a lack of capacity of HEIs to provide quality data, raising issues concerning institutional excellence and transparency. Those data which were available were analysed using a number of statistical methods. The result is that faculty research output in the Arab world is relatively low, confirming the existing notion of a lagging knowledge sector in the region. While traditional scholarship has focused on institutional factors such as budgetary allocation as one prime determinant of research productivity, this study claims that other factors need to be considered in explaining the low output, with broad implications for policy formulation. Such factors include overall satisfaction levels of academic staff, socialisation of faculty staff members into a research climate, and university mission vis-à-vis academic research. Given the distinct paucity of studies on faculty research productivity in HEIs in the Arab region, this study seeks to bridge this gap in the literature by providing original data derived from six Arab countries. The authors aim to provide a basis for further research into this topic.

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Résumé Productivité de la recherche universitaire dans six pays arabes – Les auteurs de cet article analysent les résultats de recherche obtenus par un échantillon d'institutions de l'enseignement supérieur dans six pays arabes. Leur objectif est d'entamer une quantification de la productivité de la recherche universitaire dans la région Moyen-Orient et Afrique du Nord (MENA). Un questionnaire de classification a été administré auprès de 310 institutions situées dans les pays suivants : Arabie saoudite, Émirats arabes unis (EAU), Jordanie, Liban, Maroc et Qatar. L'étude révèle un manque de capacités dans ces institutions pour fournir des données de qualité, qui soulève des questions quant à l'excellence et à la transparence institutionnelles. Les données disponibles ont été exploitées au moyen de plusieurs méthodes statistiques. Il en ressort la constatation que le rendement de la recherche universitaire est relativement faible dans le monde arabe, confirmant l'impression existante d'un retard dans le secteur des connaissances au niveau de la région. Les études traditionnelles similaires se concentrent sur des facteurs institutionnels tels que l'affectation budgétaire prise comme critère déterminant de la productivité scientifique. La présente étude soutient que d'autres éléments doivent être pris en compte pour expliquer la faiblesse du rendement, qui ont d'importantes implications sur la formulation de politiques. Ces facteurs englobent le niveau général de satisfaction du personnel universitaire, l'adaptation des membres du personnel à un climat de recherche, et une mission institutionnelle envers la recherche universitaire. Étant donné la rareté de travaux spécifiques sur la productivité de la recherche universitaire dans la région, la présente étude vise à combler cette lacune en fournissant des données de base tirées de six pays arabes. L'intention des auteurs est d'établir un fondement en vue de travaux supplémentaires sur la question.

ملخص تحلل هذه المقالة نتاج البحوث في عينة من مؤسسات التعليم العالي في ست دول عربية من أجل البدء في قياس الإنتاجية الأكاديمية البحثية على نطاق أوسع في منطقة الشرق الأوسط وشمال أفريقيا. ولهذ الغرض تم توزيع استبيان مصمم أصلا لتصنيف مؤسسات التعليم العالي على 310 مؤسسة تعليم عال في كل من لبنان، قطر، الإمارات العربية المتحدة، المغرب، المملكة العربية السعودية، فضلا عن الاردن. كشفت الدراسة عن عدم وجود قدرة لدى مؤسسات التعليم العالي على توفير جودة البيانات، ما يشير الى قضايا تتعلق بالتميّز المؤسسي والشفافية. وقد تم تحليل البيانات المتاحة باستخدام عدد من الطرق الإحصائية. بينت نتائج الدراسة أن نتاج بحوث أعضاء هيئة التدريس في العالم العربي منخفض نسبيا، مما يعزز الفكرة السائدة حول تخلف قطاع انتاج المعرفة في المنطقة. وبينما ركزت الدراسات على العوامل المؤسسية مثل مخصصات الميزانية كأحد المحددات الرئيسية في الإنتاجية البحثية، تزعم هذه الدراسة أن هناك عوامل أخرى يجب الاخذ بها في تفسير انخفاض الانتاج البحثي، مما يساهم في صنع السياسات. وتشمل هذه العوامل رضا أعضاء هيئة التدريس، تنشئة أعضاء هيئة التدريس في مناخ البحوث، ورسالة الجامعة لجهة توجهها نحو البحوث الأكاديمية. ونظرا لقلة الدراسات المتعلقة بإنتاجية البحوث لدى أعضاء هيئة التدريس في مؤسسات التعليم العالي في المنطقة العربية، تسعى هذه الدراسة إلى سد هذه الفجوة في الادبيات من خلال توفير البيانات الأصلية المستمدة من ست دول عربية. وبذلك يهدف المؤلفون الى وضع اسس تسمح بإجراء المزيد من البحوث حول هذا الموضوع.

Introduction

Concern with knowledge production in Arab countries occupies a central position in official and academic debates on the need to prepare Arab citizens to actively engage in and contribute to the knowledge society. Our definition of this engagement and contribution follows that of Sheldon Ungar (2003), namely that it encompasses the creation, utilisation and dissemination of knowledge for the development and informatisation of life in society. Such a pivotal concern is reasonable, since knowledge production in Arab countries continues to fall sharply below that of other countries of comparable economic development levels (World Bank 2008). Successive Arab Human Development Reports (UNDP-RBAS 2002, 2003, 2004, 2005, 2009) have portrayed a rather dismal picture of the slumberous pace of knowledge production in the region being curtailed by an interminable "freedom and good-governance deficit" (Alan 2005, p. 28) and stunted by a meagre allocation of research funds (UNDP-RBAS 2002), all of which result in lacklustre performance in terms of development and innovation. In turn, many higher education institutions (HEIs) in Arab countries have not yet ventured into the establishment of a research culture which embraces and encourages faculty research productivity (Saleh 2002).

Apart from the impassioned outcry of Arabs to undertake reforms in areas vital to the development of their countries, most notably enfranchising women to participate equally in public and political affairs, revamping ubiquitous obsolete governance, and reforming education, a common theme characterising these reports is their occasional sermonising, exhortative tone. For instance, in his content analysis of the seminal Arab Human Development Report (AHDR) entitled *Building a Knowledge Society* (UNDP-RBAS 2003), quoting from this report, Fouad Moughrabi has identified hortatory phrases such as

> without a strong and growing contemporary knowledge base of their own, Arab countries will be drawn into the international knowledge society as passive consumers (Moughrabi 2009, p. 27).

A similar exhortative pattern is also found in the 2008 report of the Arab League Educational, Cultural, and Scientific Organization (ALECSO), entitled *A Plan for the Development of Education in the Arab Countries,* which states the following:

> The Arab countries are confronted with the same challenge, and are perhaps greatly threatened, now and in the future, if they do not rapidly and seriously undertake to review and reform their educational systems (ALECSO 2008, p. 6).

Another characteristic shared by the burgeoning genre of development reports on the region is their emphasis on describing the current state of affairs rather than offering workable solutions involving, among others, civil society, youth and women. Over and above the prevalent descriptive nature of these reports, rare attempts have been made so far to produce evidence-based research gleaned from insight into Arab HEIs with respect to their contribution to the knowledge society

through faculty research output and publications, which are broadly perceived as a quality indicator (Rachal et al. 2008). Existing data are scattered, difficult to assemble, and unavailable in aggregate form at national or regional levels (MBRF & UNDP-RBAS 2009).

Further, the distinct paucity of reliable data on research productivity in Arab countries thwarts conducting inter- and intra-country evaluations which would supply planners and policy makers with appropriate evidence-based analysis essential for strategic planning and policy formulation.

The dire need for data on research productivity, perceived as the result of knowledge production (Prpić 2007), has been widely recognised in various policy documents across all countries worldwide, including Arab ones (UNDP-RBAS 2002). This need warrants investigation into research productivity in the region in general and in HEIs in particular, as increasing research on the topic comes mainly from North American and European contexts (e.g., Athey and Plotnicki 2000; Blackburn et al. 1991; Brocato and Mavis 2005; Amo et al. 2012; Dundar and Lewis 1998; Youn and Price 2009). To the extent that HEIs are considered traditional repositories of knowledge production and dissemination (Creamer 1998), reform initiatives as reflected at least in the last five Arab League summits (Tunis 2004, Algiers 2005, Khartoum 2006, Riyadh 2007 and Amman 2009),[1] as well as in the numerous reform recommendations established for the region, will remain inchoate in light of the lack of evidence on the conditions of knowledge production originating in HEIs.

Our study seeks to bridge this gap in the literature by analysing data on faculty research productivity together with budgetary allocation for research activity and research centres in 310 higher educational institutions in six Arab countries (Lebanon, Qatar, the United Arab Emirates [UAE], Morocco, Saudi Arabia and Jordan). Such an endeavour will significantly contribute to understanding the research performance of HEIs in Arab countries in light of the reform strategies seeping into the education landscape of the region, namely quality assurance, internationalisation, and the neoliberal model (Buncker 2011). It is worth remembering that these strategies have given impetus to the rise of an impressive panoply of higher education institutions in the region of the Middle East and North Africa (MENA). Student numbers have risen from 2.9 million in the academic year of 1998–99 to 7.6 million in 2007–08, a leap of 256 per cent (UNESCO Regional Bureau for Education in the Arab States 2009, p. 5).

The vast array of HEIs in the Arab region can be distinguished by sector (public, non-public/non-profit, non-public/for-profit), affiliation (to the Ministry of Higher Education, other ministries), status (universities, independent colleges, technical institutes, community colleges, etc.), type (traditional, open, virtual), nationality (national, regional, international institutions or branches of them), model (American, French, German, etc.), cultural reference (Islamic, Christian, non-religious institutions), orientation (profession-oriented, academic-oriented), legality

[1] The Arab League, a political, economic and cultural union founded in 1945, currently has 22 Member States (though Syria's membership was suspended in November 2011). It has an administrative system, a charter, and many common agreements which are outcomes of Arab League summit conferences. The most recent summit was held in March 2015 in Sharm el-Sheikh, Egypt.

(effective institutions, so-called "diploma-mills"), recognition from respective authorities (licensed, accredited, assured institutions), and by degree (BA/BSc, MA/MSc, PhD pattern (ibid.)). While falling beyond the scope of the current study, one important area to examine and analyse would be faculty research productivity in light of diverse, institutional missions and the explicit role of research in their stated mission statements, given that research is a key element in the tripartite role of faculty staff members, with the other two being teaching and institutional service.

By analysing and disseminating survey findings on faculty research productivity in HEIs in six Arab countries, this study aims to provide a clearer understanding of research conditions for academic staff in higher education and a sharper awareness of the importance of the myriad benefits of faculty research at institutional, personal, national and regional levels. The latter two have not yet received enough attention in the pertinent literature.

While there is a plethora of studies in the field which can be mapped out along two strands, personal and institutional, these studies have ignored analysis of between- and within-country comparisons as well as between HEIs distinguished by sector and type. These aspects are the subject of the present investigation.

The first strand of existing research has looked at faculty staff members' personal demographic characteristics, such as age, gender (Dundar and Lewis 1998) and socioeconomic status (Webber 2011) as predictors for explaining variations in research productivity. Other studies have looked at variables such as working environment and previous academic and professional experience (Helsi and Mook 2011; Hu and Gill 2000; Williamson and Cable 2003). Within this strand of research, numerous perceived factors benefiting faculty research productivity have been documented, such as securing external funding, preventing research isolation (Shaw 2002), gaining recognition in academic circles (Youn and Price 2009), boosting faculty staff members' self-esteem and reputation (Creamer 1998), providing greater mobility and higher salaries (Hu and Gill 2000), and promoting wider exposure to academia (Grover, Segars and Simons 1992; Levitan and Ray 1992).

The second strand of existing research has examined institutional characteristics such as the reputation and scholarly output of university departments and faculties (Long et al. 1998; Lin and Bozeman 2006). Other studies show that changes in promotion requirements in higher education determine the amount and degree of academic staff engagement in research and publication (Cargue and Bublitz 1986; Campbell and Morgan 1987; Milne and Vent 1987; Englebrecht et al. 1994; Read et al. 1998). Furthermore, it has been reported that differences in scientific disciplines may affect the productivity patterns of academics (Levin and Stephan 1991). The potential for a relationship between research productivity and such variables may lie in institutional processes, such as the socialisation of scholars into a research culture (Williamson and Cable 2003) and institutional support at all levels. Overall, the old adage "publish or perish" (Gray and Birch 2000) continues to accentuate the importance of research productivity to academic careers and serves as a useful barometer of a programme's research quality and a factor for measuring excellence (Rachal et al. 2008).

This study espouses a third, previously unexplored, research strand by looking into variables such as sector (private, non-private), country, and type of institution (university, other HEIs) as potential predictors for explaining variations in faculty research productivity. In addition, our study provides insight into other, additional factors as possible predictors of overall research productivity of academic faculties measured institutionally, such as budgetary allocation for research and the presence of research centres. The study was thus conducted with the aim of answering the following research questions:

Q_1: Does research productivity in the selected sample correlate with budgetary allocation for research?
Q_2: Given that state expenditure on higher education by Arab states has been re-channelled to primary and secondary schooling in the last two decades (Guazzone and Pioppi 2009), is faculty research productivity in public HEIs predictably lower than that of their counterparts in the private sector?
Q_3: Do existing data results, however insufficient, suggest that there are significant inter-country differences with regard to faculty research productivity, especially given that the entirety of HEIs in one region cannot be treated in a monolithic way in light of their diversity?

Methodology

Sample

The total number of HEIs surveyed was 310 and they were drawn from six Arab countries as part of a pilot project dealing with the classification of HEIs in the MENA region conducted in 2009 by the Lebanese Association for Educational Studies (LAES) and the Institute of International Education (IIE) (Bhandari and El-Amine 2012). The countries for the study were selected on the basis of their classification according to their Gross Enrolment Ratio (GER).[2] Arab countries strongly differed in this regard in 2008 (UNESCO 2009): (1) Countries with a GER above 40 per cent (Jordan, Kuwait, Lebanon, Libya and Palestine); (2) Countries with a GER below 19 per cent (Iraq, Mauritania, Morocco, Somalia, Sudan and Yemen); and (3) Countries with a GER between 20 per cent and 39 per cent (Algeria, Bahrain, Egypt, Oman, Qatar, Saudi Arabia, Syria, Tunisia and UAE) (UNESCO Regional Bureau for Education in the Arab States 2009, p. 7). The selection of countries was made with an eye towards representing all three GER tiers, resulting in survey responses from the top (Jordan, Lebanon), the middle (Qatar, Saudi Arabia, Tunisia and UAE), and lowest-scoring GER tiers (Morocco). In addition, the geographic breadth of the sample furnishes a panoramic view,

[2] The online glossary of the UNESCO Institute of Statistics defines the gross enrolment ratio as the "number of students enrolled in a given level of education, regardless of age, expressed as a percentage of the official school-age population corresponding to the same level of education. For the tertiary level, the population used is the 5-year age group starting from the official secondary school graduation age" (see http://glossary.uis.unesco.org/glossary/en/term/2048/en [accessed 12 October 2015]).

Table 1 Breakdown of the sample by country

Country	*n*	%
Jordan	49	15.8
Lebanon	41	13.2
Morocco	68	21.9
Saudi Arabia	19	6.1
Tunisia	71	22.9
Qatar	11	3.5
United Arab Emirates (UAE)	51	16.5
Total	**310**	**100**

perhaps generalisable, of the Arab higher education sector in the aggregate, from the Arab Middle East to North Africa. Given the relative paucity of wide-ranging research studies of this type, the current study represents a step forward in the compilation and analysis of research data in this particular world region.

Institutions included in the study were almost equally divided between public (50.6%) and non-public (49.4%), the latter comprising private independent institutes, community colleges and private cross-border entities. In terms of type, these institutions were classified as universities, university colleges, higher education institutes and business schools, among others, which were collapsed into the dichotomous variables of universities (52.9%) and *other* HEIs (47.1%). The breakdown of all institutions by country is shown in Table 1. Tunisia was removed from subsequent calculations due to a lack of data.

Questionnaire

A questionnaire was developed by a Scientific Committee (SC) comprising LAES members and experts in higher education. The questionnaire contained 11 dimensions adopted from the Carnegie Foundation for the Advancement of Teaching (McCormick et al. 2008), the European Classification of Higher Educational Institutions (U-MAP; Van Vught et al. 2010),[3] and other complementary variables added by LAES. Dimensions listed ranged from teaching and learning profile to international engagement, and included areas such as student profile and religious orientation as well. Only one dimension was used for examining faculty research productivity, namely *research involvement*, which included academic faculties' publications, research centres, and percentage of budgetary allocation for research. The remaining variables were employed in preparation for a future classification scheme of HEIs in the MENA region, and not to examine differences

[3] According to their homepage, the Carnegie Foundation for the Advancement of Teaching, an education policy and research centre headquartered in Stanford, CA, is "committed to developing networks of ideas, individuals, and institutions to advance teaching and learning". For more information, see http://www.carnegiefoundation.org/ [accessed 12 October 2015]. For more information on the ongoing European Classification of Higher Educational Institutions (U-MAP) project, see http://www.u-map.eu/ [accessed 12 October 2015].

in performance among them *per se*. In addition, the questionnaire included questions about sector, type, year of establishment, address, and name of the person who filled in the questionnaire on behalf of the institution.

Internal deliberation by the study's Scientific Committee (SC), together with selected country coordinators, took place to ensure that all questionnaire items directly targeted and were relevant to the data requested, with an eye towards data utility in the future classification system being designed. Consensus was reached on the utility and validity of the questionnaire as an instrument for data collection. Cronbach's alpha, as an internal consistency measure of scale reliability (Cronbach 1951), was ruled out since the questionnaire used in the current study did not contain items spread on a Likert scale.

Procedure

LAES commissioned one national coordinator (NC) for each country, selecting individuals with a broad knowledge of the higher education landscape in each pre-selected Arab state. During the preparatory phase of data gathering, NCs appointed for data collection submitted a list of all HEIs in their countries. In Phase I, the NC filled out the questionnaires covering all HEIs in the country based on desktop research. Available data were obtained from the ministry of higher education for each respective country, and complemented by information provided by contacts at HEIs. In this phase, the NC collected and provided responses for all questionnaire items for which information was available. Filled-in questionnaires were then submitted to LAES.

In Phase II, the NC sent out the filled-in questionnaires to respective HEIs, requesting them to validate the information gathered and provided during the first phase with an appeal for completion of the remaining sections and items, as applicable. HEIs surveyed were assured of the entirely academic nature of the study and of the use of data collection for non-commercial research purposes only. This was done across countries to ensure uniformity of data collection procedures. NCs were asked to remain neutral in their interaction with HEI representatives and not to press for data when these were not readily and voluntarily provided. The SC provided oversight over all NCs to ensure consistency over data-collection methods.

Filled-in questionnaires were subsequently submitted by the NC to a central team at LAES for data entry and further verification. The purpose of this two-phase process was to (1) double-check all collected data when necessary by the NC and the respective HEI; and (2) ensure that all HEIs in the selected countries were both included and served as the primary arbiters of data. Data consistency was corroborated by the high positive correlation among the same variables entered separately according to a variable coded "phase" indicating Phase I and Phase II: the two phases of data collection replicated almost the same results.

After meeting the initial objective of constructing an Arab HE classification scheme, the final dataset was made available to LAES members, including one of the authors of this article, for further research and analysis. The current study is thus the by-product of a comprehensive country-by-country survey of higher education in the Arab world whose data results have been made available and which will form the basis for further research directions in the future.

Data analysis

Research productivity is traditionally measured as the ratio of total publications to the number of faculty staff members. This includes journal articles, books published or accepted for publication, patents, copyrights, presentations and chapters in edited books (Levin and Stephan 1991; Mooney 1991) produced within a specified time-frame, in our case two years (Olson 1994). Information on the published work of academic staff can be obtained either from surveys or through bibliographic searches (Xie and Shauman 1998). The relative weight of each publication type varies according to discipline (Brooks 2005). Numerous limitations underlie the publication count as a measure of research output, as it does not distinguish between single-authored and co-authored publications. Nor does publication count necessarily signal research quality as measured through the impact factor, that is, the frequency of citation of a given article within two years divided by the total number of articles published in the same journal during the same period (Mathur and Sharma 2009). Furthermore, most survey instruments do not separate peer-reviewed journal articles and books from other non-academic forms of publication (Xie and Shauman 1998). Despite these limitations, we contend that the ratio of total publications to the number of faculty staff members is the single most commonly used practice for measuring faculty research productivity; we have therefore applied it to the various Arab sectors examined here.

In the present study, research productivity was measured by looking at the multiple types of publications discretely in peer-reviewed Arab (defined here as "local") journals; non-peer-reviewed Arab/local journals; peer-reviewed foreign journals; chapters in Arab books; chapters in foreign books; conference proceedings; books in Arabic; and books in other languages. A composite score measuring research output was created by dividing the total number of publications by the number of academic staff in each institution. The counting method used in this study, which overlooks single- versus co-authorship as well as the impact factor (measured in terms of citations by other authors), was deemed insignificant given the exploratory nature of this analysis. A major challenge in conducting a thorough analysis of this type among Arab HEIs is the lack of public disclosure pertaining to their faculties' research output, an impediment already noted in various publications on the subject, resulting in a large number of missing data.

The institutions surveyed differed in their responses to the primary question of research budgetary allocation. On this key question, 28 (or 44.4%) of the public universities and 37 (or 36.6%) of the private universities provided answers, overwhelmingly in the affirmative, indicating that they allocated budget for research. Twenty-four (or 46.2%) of the private "other HEIs", including community colleges and institutes, indicated budget allocation for research, whereas only two (2.1%) of the public "other HEIs" indicated the same. Our assumption about the reasons for missing data in the present study includes the lack of reports on faculty research output by country and within the HEIs surveyed, as well as a distinct lack of financial transparency, a vital area earmarked for future research. Moreover, the relative weight of each publication was not counted, given the lack of access to institutional policies and criteria which might determine differential publication

weights as institutionally determined and would have had to be further confirmed by an additional survey of selected HEI websites with regard to their research priorities. Again in line with the standard practice (Olson 1994), faculty staff members' publications were counted over a period of two years, in this case from 2009 to 2011.

The provision of budgetary data, or rather the lack thereof, contrasts sharply with HEIs' willingness to provide certain types of data not deemed of a sensitive nature and thus fit for viewing, again suggesting a general problem with public disclosure, though in some cases the (in)capacity to mine internal data of a more complex nature may also be a possible reason. For example, on the standard question of the number of faculties or colleges within HEIs, all 310 (or 100%) either answered in Phase II or verified their data in Phase II. With regard to their single-sex or coeducational status, 302 (or 97.4%) answered, while information about the number of female PhD holders among faculty staff (a relatively straightforward figure) yielded only a 34.5 per cent response rate. We conclude from such comparisons that "missing" data are less due to characteristic differences among institutions surveyed but rather reflect institutionally-determined distinctions among public vs. private data, including financial budgetary information.

A mean score representing an index of total publications was obtained by adding the ratios of each publication type (e.g., non-peer-reviewed Arab/local journals; peer-reviewed foreign journals; chapters in Arab books, etc.) to the number of faculty staff members for each type of publication, and dividing the result by the number of types of publications, in our case eight types. Moreover, the ratio of each publication to the number of faculty staff members represented a continuous variable allowing for mean comparison. An independent *t*-test was employed to compare mean differences of faculty research productivity by sector (public, non-public) and type (university, other HEIs). In addition, a one-way Analysis of Variance (ANOVA) was used to compare publication mean scores across the countries involved in the study. A Levene's test for homogeneity of variance was employed in order to ensure that performing an ANOVA test did not violate the stringent assumptions for running a parametric test. Levene's test results yielded no significant differences between the independent variables employed on faculty research productivity ($p > .05$), assuming that assumptions for conducting parametric analysis were met. Finally, a Pearson correlation was performed to examine possible associations between faculty research productivity and budgetary allocation for research.

Findings

General profile of faculty research productivity

What is immediately discernible is that many data on faculty staff members' publications for the academic years 2008–2009 and 2009–2010 are missing in the responses of the majority of HEIs involved in the study, restricting meaningful analysis of faculty research productivity to a limited number of institutions which were in turn disproportionally distributed across countries. The figures presented in Table 2

Table 2 The distribution of faculty staff members' publications (in per cent)

Type of publication	Answered		Missing	
	n	%	*n*	%
Peer-reviewed Arab/local journals	38	12.3	272	87.7
Peer-reviewed foreign journals	54	17.4	256	82.6
Non-peer-reviewed Arab/local journals	29	9.4	281	90.6
Chapters in Arab books	16	5.2	294	94.8
Chapters in foreign books	30	9.7	280	90.3
Conference proceedings	50	16.1	260	83.9
Books in Arabic	27	8.7	283	91.3
Books in other languages	32	10.3	278	89.7

Table 3 The distribution of faculty staff members' publications (means and standard deviations)

Type of publication	SD*	$\bar{X}$
Peer-reviewed Arab/local journals	100	44.1
Peer-reviewed foreign journals	152.4	86.2
Non-peer-reviewed Arab/local journals	57.4	30.6
Chapters in Arab books	7.58	4
Chapters in foreign books	11.6	8.1
Conference proceedings	97	60.7
Books in Arabic	28.6	15.3
Books in other languages	8.1	6

* The large standard deviations are attributed to a wide spread in the data as evident in large kurtosis, and sharp skewedness to the right of the distribution

are alarming given the general expectation of HEIs being platforms for knowledge production and socioeconomic advancement (Schofer 2004; Creamer 1998).

The "not provided" or missing cases fluctuated from a minimum of 82.6 per cent on peer-reviewed foreign journals to a maximum of 94.8 per cent on chapters in Arab books, suggesting a conspicuously obvious neglect of data provision on faculty staff members' publications. Another characteristic of available data provided for type of faculty staff members' publication lies in the large dispersion across all types of journal publications, yielding large standard deviations (152.4 on peer-reviewed foreign journals) on the one hand, and narrower standard deviations in the general "book" category on the other (see Table 3).

In addition to the above, 75 (or 24%) out of 310 HEIs surveyed answered the question of whether they issued institutional reports about their faculties' research productivity. While 37 per cent of these institutions documented that they issued reports on faculty research output, 63 per cent said they did not issue such reports. If we collapse the occurrences of "no response" with the missing cases, we are left with only 9 per cent of institutions which indeed issued reports on their faculty staff members' research output.

Table 4 Report on faculty research output by country

Country		Did not provide reports on faculties' publications	Provided reports on faculties' publications	Total
Jordan	*n*	2	2	4
	Row %	50%	50%	100%
	Column %	4.3%	7.1%	5.3%
Lebanon	*n*	10	0	10
	Row %	100%	.0%	100%
	Column %	21.3%	.0%	13.3%
Morocco	*n*	4	3	7
	Row %	57.1%	42.9%	100%
	Column %	8.5%	10.7%	9.3%
Saudi Arabia	*n*	3	7	10
	Row %	30%	70%	100%
	Column %	6.4%	25%	13.3%
Qatar	*n*	3	3	6
	Row %	50%	50%	100%
	Column %	6.4%	10.7%	8%
UAE	*n*	25	13	38
	Row %	65.8%	34.2%	100%
	Column %	53.2%	46.4%	50%
Total	***n***	**47**	**28**	**75**
	Row %	**62.7%**	**37.3%**	**100%**
	Column %	**100%**	**100%**	**100%**

Delving deeper into public disclosure of research production, differences were observed within and among countries which did provide information (see Table 4). Saudi Arabia had the highest percentage of national institutions providing reports on their faculties' publications (70%) and UAE reported the largest share of all institutions providing such reports (46.4%).

General profile of research centres

Only 41 institutions (or 13.2%) provided information on the total number of research centres. The sum of research centres was 180, with a mean score of 4.39 and a standard deviation (SD) of 5.58.

General profile of budgetary allocation on research in percentages of the total operating budget

Ninety-one (or 29%) out of 310 HEIs provided information on their research expenditures from their operating budget. The minimum was 0 per cent and the maximum was 26.4 per cent, with a mean of 2.47 and SD of 4.89. Table 5 shows that HEIs in Saudi Arabia registered the highest mean of expenditure on research

Table 5 Distribution of means and standard deviations of budgetary allocation for research in higher education by country

Country	*n*	$\bar{X}$	SD
Jordan	9	2.20	2.33
Lebanon	20	2.68	3.43
Morocco	11	2.70	5.76
Saudi Arabia	8	4.51	8.72
Qatar	3	.00	.00
UAE	40	2.14	4.97
Total	**91**	**2.47**	**4.89**

reported in percentages, followed by Morocco, then Lebanon. The lowest was Qatar, which answered this item as 0 per cent, indicating no budgetary allocation for research.

To answer our first research question as to whether research productivity is associated with budgetary allocation for research, a Pearson correlation was conducted between the index of total faculty research output and institutional budgetary allocation for research provided in percentages. A weak and insignificant association was found, ($r = .18$; $p > .05$), attesting to the virtual divorce between budgets allocated for research and research output among academic faculties. We found the same pattern of low and insignificant correlation between research output and budgets allocated for research in HEIs in each country separately.

Independent t-test results

Our second research question at the outset of this paper was whether faculty research productivity in the public sector is predictably lower than its counterpart in the private sector; a key issue as far as the Arab tertiary sector is concerned. The independent t-test results rejected the question's underlying assumption, since expenditure on research was not significant ($t = -.014$; $df = 89$; $p > .05$), with the mean being 2.43 for the public sector and 2.47 for the non-public sector. However, a significant difference was found for index of all publications, with the non-public sector scoring a higher mean ($\bar{X} = 9.89$; $SD = 4.52$) than the public sector ($\bar{X} = 4.96$; $SD = 3$), $t = -1.8$; $df = 60$; $p < .05$. We further found no significant differences between university and other HEIs on research expenditure, although universities scored a slightly higher mean ($\bar{X} = 2.27$; $SD = 4.47$) than the private sector ($\bar{X} = 1.72$; $SD = 5.18$). In terms of publications, "other HEIs" scored a higher mean ($\bar{X} = 7.61$; $SD = 4.74$) than the public sector ($\bar{X} = 5.45$; $SD = 3.59$), yielding a near-significant difference between both ($p = .056$).

ANOVA and Scheffe test results did not yield significant between-country differences, thus answering our third research question in the negative. However, mean differences were found among six countries whose HEIs ($n = 62$) provided information on their academic institutions' research productivity. Results showed

Table 6 Mean and standard deviations of faculty research productivity in six countries

Country	*n*	$\bar{X}$	SD
Jordan	4	6.25	.95
Lebanon	6	5.00	3.57
Morocco	9	3.78	2.86
Saudi Arabia	10	5.20	3.25
Qatar	4	6.50	4.04
UAE	29	7.24	4.70
Total	**62**	**6.08**	**4.046**

that UAE registered the highest mean among other countries, followed by Qatar. Morocco had the lowest country mean of academic publications (see Table 6).

Discussion

Preliminary data from the study point to two possible, not necessarily incompatible, conclusions. The first seems to confirm the widespread view that research output in Arab higher education is comparatively low, with per-country mean scores ranging from 3.78 (Morocco) to 7.24 (UAE). The second, almost incidental theme to emerge from the study points to the problem of insufficient data provision, a narrative about the inability to collect, synthesise and report quality data for proper assessment and evaluation. If the first conclusion is accepted as valid (and in our view the low research output mean per institution strongly suggests this), then the prevailing notion of an Arab knowledge deficit (MBRF & UNDP-RBAS 2009) and its link to broader socioeconomic development (Alan 2005) is not merely speculative but largely supported by survey results, however limited. This conclusion would largely confirm much of the policy-focused discourse about the low rate of academic research productivity among Arab HEIs (UNDP-RBAS 2003, 2004, 2005, 2009; World Bank 2008). On the other hand, the inability to gather and report data, the study's other key finding, points to a broader problematic of internal, institutional capacity and is also cause for concern.

Various other conclusions can be drawn from the conduct and results of the study. The first contravenes a salient theme in the scholarship on faculty research productivity, much of it U.S.- and Europe-based, by questioning the applicability of a direct, linear correlation between budget allocation and research productivity among Arab HEIs (Athey and Plotnicki 2000; Brocato and Mavis 2005; Hu and Gill 2000). The Pearson correlation testing the strength of the relationship between research productivity level and budgetary allocation turned out, at best, to be very weak. Evidence supports this finding: the one country-specific HE sector reporting the highest financial support for research activity on average of any country surveyed (Saudi Arabia with a mean score of 4.51) trails other Gulf countries (UAE, Qatar) and falls within the standard deviation of others (Jordan, Lebanon, Morocco) in mean research output. This is highly revealing, given that both UAE and Qatar

reported the *lowest* budgetary allocation for research on average of any of the countries reporting (2.14 and 0 for the UAE and Qatar, respectively). Despite weak response rates and low-quality data, Moughrabi's 2009 admonition against a Western model for assessing knowledge in the Arab world is well-placed, as is Ungar's 2003 critique of the concept of the knowledge society.

Furthermore, the distinction between public and non-public HEI sectors did not prove a sufficient predictor of faculty research productivity. With budgetary allocation essentially constant (2.43 and 2.47 were the mean scores for the public and non-public sectors, respectively), public institutions scored higher, on average, in terms of research productivity levels (mean scores of 9.89 and 4.96 for each sector respectively) than the private sector, taking the sample as a whole. This is striking, and furnishes powerful evidence of the need to delve deeper into the multiple aspects affecting low research productivity levels beyond traditional factors (Levitan and Ray 1992; Levin and Stephan 1991; Xie and Shauman 1998). This incipient research study is, however, not an argument for dismissing budgetary allocation as a key factor in enhanced research productivity; instead, there is a clear need to go beyond the scope of this study and examine the broader context of research engagement in the Arab world, including the roles of campus climate and university mission, in order to explain more accurately the counter-intuitive findings of a weak association between budgetary allocation and research output.

The second point brings us back once more to the conclusion made above and has to do with the provision of quality data on research output among the sample. The remarkably low levels of public disclosure of research output among HEIs speak volumes about the capacity, or lack thereof, of internal data mining and reporting, and thus of quality measures (Mathur and Sharma 2009; Brooks 2005): only 75 out of the 310 institutions surveyed provided some sort of response to the various queries on research involvement, even though the same institutional respondents went on to furnish other types of data. The survey did not discriminate against "zero" responses, nor were missing cases counted as zeros: institutions reporting zero productivity on, say, the number of books in Arabic were counted as such in the calculation of mean scores. Compounding this is the fact that a mere 9 per cent of all HEIs surveyed issue status reports on their faculties' research output for internal or external consumption. But the "missing" cases present a troubling spot on the future horizon of research studies in the Arab world, again raising questions about internal data tracking or, at worst, institutional commitment to public disclosure.

Perhaps it is the distinctive nature of the Arab higher education sector today, after two decades of neoliberal ideology and privatisation, which explains some of the survey results at play. Future studies should start by questioning assumptions in higher education studies as they apply to the Arab sector. Better insight would derive, for example, from looking at cross-border institutions and the import substitution of local faculty staff by "professional" academics from abroad with established résumés, distorting the correlation between research output and budget allocation as in the case of Saudi Arabia versus Qatar and the UAE. Perhaps more to the point, there is clearly a need to broaden the scope of analysis of causal factors on research output by looking at organisational culture specifically, so that we can understand the scholarly environment into which the socialisation of

faculty staff members is taking place. With regard to financial support for research, studies have yet to classify the type and source of funding (corporate, say, versus public, or national versus international) of Arab researchers, an important venue for future research. Finally, there is the question of academics' personal satisfaction levels with the profession in the Arab world, in which full-time faculty staff members are operationally and functionally "adjunct", undoing the distinction between contingent and tenured or full-time staff as described in Western scholarship on the subject. In light of these broader questions, future studies will hopefully present the story of research productivity from the inside, and thus be able to make sound recommendations for progressive higher education policy in the Arab region.

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