The impacts of scientific research fund (SRF) on improving research building capacity of graduate students and Benha University ranking

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ABSTRACT

The activities of Scientific Research Fund (SRF) in Benha University (BU) were started at 2013 aiming to support the research capacity building of junior researchers and postgraduate students with financial fund. During the last three years, 83 research proposals were submitted to SRF and 35 projects were accepted. All the researchers received a training program of using the scientific research softwares such as Endnote, SPSS and the skillful use of digital library. All the researchers were mandated to upload their research papers on the Portal Website of BU along with the websites of Google Scholar and Research Gate to improve the World ranking of BU. Nowadays, 35 research groups were established in different faculties of BU. The major impacts of funding these groups were: 1) increasing significantly and considerably the number of citations in BU (32496 citation), 2) increasing the number of impacted publications (1 publication), 3) elevating significantly BU ranking globally to be 1238 in the last webometrics ranking issued in January 2016 and to reach the 3rd position in the Egyptian Universities ranking. In practice, we are looking to have an advance ranking in QS ranking particularly in Arab region.

Keywords: Benha University, Scientific Research Fund, World Universities Ranking, Research Citations, Impacted Publications.

Establishing and activities of BU Scientific Research Fund:

The international publications of the scientific research papers are considered the common factors for the major types of World ranking of universities. In the last three years, BU has adopted different steps to compete with the other Egyptian universities nationally and internationally in terms of publications and citations. In 2013, the scientific research fund (SRF) was established according to the decision number 97 dated 22-4-2013 issued by BU Council. One of the most important strategies was to grant the young researchers (less than 40 years old) with financial support of 100000 Egyptian Pounds on a competitive research basis for senior researcher at different faculties. This fund was imposed for the researcher with the following restrictions: 1) publishing at least two scientific papers in impacted Journals with impact factors of at least 1.0, or 2) applying for great grant project locally or internationally, or 3) getting an innovation patent. BU Council has supported this SRF by forming the Higher Committee of World Universities Ranking (**HCWUR**).

According to the rules of this SRF, the research proposals were released on the university's official portal, allowing the researcher to fulfill and submit online their proposals of projects. The proposals of 85 research groups were submitted during the last three years (2013, 2014 and 2015) and 35 proposals were selected by the committee for funding. The proposals of

projects were refereed by the permanent members of the promotion Committee approved by the Higher Education Council. The impact of funding of these projects on the improvement of BU World ranking was evaluated.

World Universities Ranking:

Many systems of university rankings have emerged in the recent years, including Shanghai Academic ranking of world university (ARWU), QS ranking, the times Higher Education (THE), the Webometrics, 4ICU and the US news ranking. These rankings take into account the scientific research outputs and qualities. For example, the shanghai ranking of ARWU depends on 40% of the score for scientific research performance (SJTU, 2013), while THE ranking depends on 30% (TWUR, 2014), and QS ranking depends on 20% (QS, 2014).

The Academic Ranking of World Universities or Shanghai Ranking was published in 2003 by Shanghai Jiao Tong University (SJTU) in China. These were initially used to establish the standing of Chinese universities internationally following the launch of the governmental initiative to create world-class universities (The Guardian, 2013). The Shanghai Ranking was soon followed by the **Quacquarelli Symonds** World University Ranking (QS) and Times Higher Education World University Ranking (TWUR). Nowadays, the ranking of World Universities has received a great interest from the academic leaderships to make their policy decisions. The ranking process is based on many indicators, including the quality of scientific research, the learning and educational processes, the quality of services provided by the institutions and the quality of the graduates. The ranking process requires different data sets and methodologies for evaluating the universities where some ranking agencies receive their data from the Official Portals of the universities, while the others depend on the questionnaires for the stakeholders. However, most of the ranking agencies depend on the scientific data bases such as Scopus and ISI to evaluate the quality of scientific research. In addition, Google Scholar citations have been utilized to evaluate the research outputs and qualities of higher education institutions based on the public profiles of their members. These outputs and qualities of scientific research are the major determinant indicators in most of the world university rankings.

Aim of the work:

This work aimed to discuss the impacts of establishing the scientific research fund (SRF) of BU in the progress of World ranking of BUmeasured by different tools of the ranking process.

Data collection and Methodology

The main sources of data collection were based on Scopus and Scival, where many of the academic ranking agencies could collect their information. The data of researchers belonging to BUalong with their international publications and citations were collected in excel sheet from the period from 2012 to 2015. The total citations of all staff members in BU were also derived from the official page of Google Scholar citation at https://scholar.google.com.eg/citations?mauthors=bu.edu.eg&hl=en&view_op=search_authors. Data were collected from the top 10 public profiles of each faculty of BU. Also, the data of webometrics ranking were collected from their official page at www. webometrics.info where the list of this ranking results are published biannually on January and July.

Data analysis

The data of citation and publications for staff members of BU collected before and after the establishment of SRF was analyzed by estimating the % increase by using excel program to detect the changes before and after the establishment of SRF. The impacts of funding 35 research projects supported financially by the SRF were taken into account in the progress of BU ranking.

Reporting Results

The Scopus and Scival citations:

The data of citations and publications extracted from Data Base of Scopus website are shown in Table 1 and Figure 1. The number of researchers in BU publishing their works in International Impacted Journals was increased from 884 in year 2012 to be 1137 in year 2015, representing a 22.3 % increase after the establishment of SRF along with the motivation of the researchers by financial support. Accordingly, BU supporting the staff members financially taking their citations and impacted publications into account. Also, BU gave motivations for uploading the scientific research papers of the staff members on websites of Google scholar and Research Gate. Accordingly, the numbers of international publications have been increased from 1043 before the establishment of SRF in year 2012 to be 1425 in year 2015, with a percent increase of 26.8% suggesting the great role of SRF in promoting the international publication.

Table 1: The citations and publications for BU before (in year 2012) and after (in year 2015) the establishment of SRF extracted from Data Base of Scopus website

Item	Before the establishment of SRF	After the establishment of SRF	Percent of increase
Across all faculties:			
No of staff members	3820a	4349b	**12.2**
Authors	884a	1137b	22.3
Intl. Publications	1043a	1425b	26.8
Citations	2586a	3178b	18.6
Citation per publication	2.5a	2.2**b**	-13.6
Field-weighted citation	0.73a	1.54b	52.6

The estimate with different letters is significantly different from corresponding value in the same row ($p < 0.05$).

The number of citations of BU papers recorded at Scopus database was increased from 2586 citation before the establishment of SRF to 3178 citation in year 2015 with a percent increase of 18.6% (Table 1). In addition, the field-weighted citation was increased from 0.73 to 1.54 with a percent increase of 52.6%.
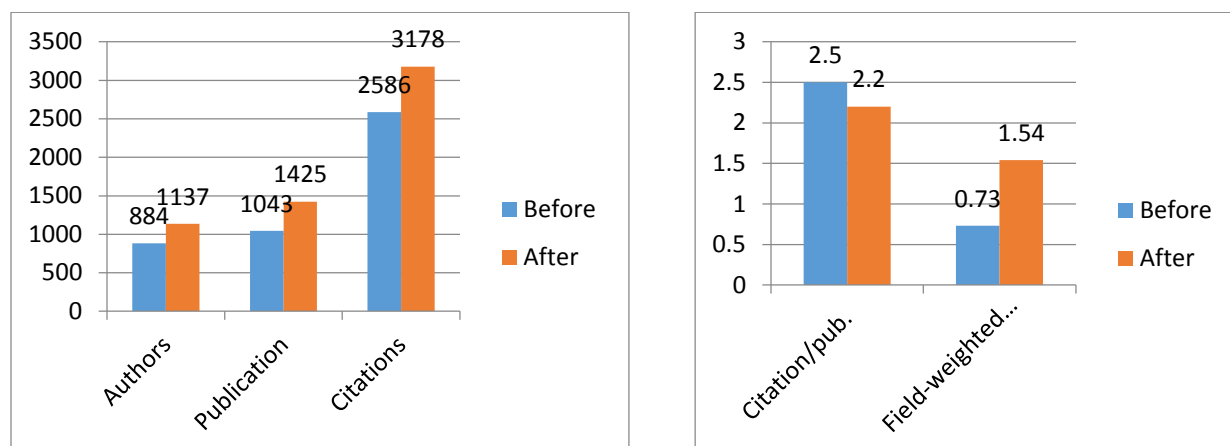
Figure 1: Comparing the research performance in BUbefore and after the establishment of SRF in terms of publications and citations.
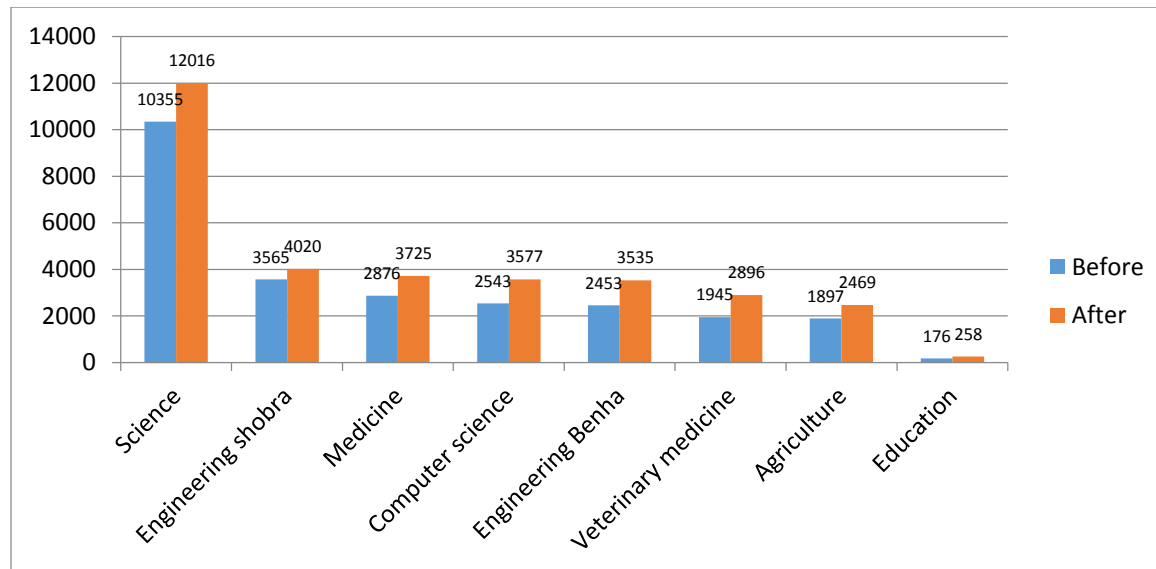
The Google Scholar citations of the staff members in Benha University:

Google scholar citation has been used as a source of data for the Webometrics ranking. Therefore, BU administration has mandated all the researchers who got the research funds to register and upload their research papers on Google Scholar website. For that reason and based on the public staff profiles of Google Scholar for Benha University, the total citation of the top 10 public profiles of different faculties was increased from 25810 citation in year 2012 to be 32496 citation in year 2015, with an increase of 21%. The Faculty of Science had the highest increase (1661 citation) followed by the Faculty of Computer Sciences, Engineering (Benha), Veterinary Medicine, Medicine, Agriculture, Engineering (Shobra) and Education.

Table 2: The total citations in Google Scholar website of the top 10 public staff profiles before and after the establishment of SRF for different faculties in BU

Faculty	Top 10 public staff profiles			All staff profiles		
	Before SRF	After SRF	Percent of increase	Before SRF	After SRF	Percent of increase
Science	10355a	12016b	16.0	13450a	19280b	43.3
Engineering, Shobra	3565a	4020b	12.7	8330a	9477b	13.8
Medicine	2876a	3725b	29.5	5668a	6820b	20.3
Computer science	2543a	3577b	40.6	3340a	4530b	35.6
Engineering, Benha	2453a	3535b	44.1	2740a	3880b	41.6
Veterinary Medicine	1945a	2896b	48.9	5565a	6350b	14.1
Agriculture	1897a	2469b	30.1	6340a	7010b	10.6
Education	176a	258b	46.6	480a	504b	5.0
Total	25810a	32496b	25.9	45913a	57851b	

The estimate with different letters is significantly different from corresponding value in the same row ($p < 0.05$).

Figure 2. The increase in the Google Scholar citations of the top 10 public staff profiles for different faculties before and after the establishment of SRF.

The Research Gate citations of the staff members in Benha University:

Based on the profiles of the authors on Research Gate, the data presented in Table 3 demonstrated that the total citations of the staff profiles in different faculties was increased from 25810 to 32496 with an increase of 26 %. The Faculty of Science has the highest increase (12016 citation), followed by the Faculty of Engineering at Shobra that had 4020 citation. On the other hand, the faculty of Veterinary Medicine had the highest percent increase in the number of citation (48.85%), followed by Faculty of Education and Faculty of Engineering at Benha (46.6%, 44.1%, respectively).

Table 3: The total citations in Research Gate website for the staff profiles before and after the establishment of SRF in different faculties of BU

Faculty	Before SRF	After SRF	Percent of increase
Science	10355a	12016b	16.0
Engineering, Shobra	3565a	4020b	12.7
Medicine	2876a	3725b	29.5
Computer science	2543a	3577b	40.6
Engineering, Benha	2453a	3535b	44.1
Veterinary Medicine	1945a	2896b	48.9
Agriculture	1897a	2469b	30.1
Education	176a	258b	46.6
Total	25810a	32496b	25.9

The estimate with different letters is significantly different from corresponding value in the same row ($p < 0.05$).

The impacts of SRF funding on young researchers in BU:

The successes story for SRF in BU could be summarized in the figures given in Table 4. On the first call of SRF in 2013, nine projects were funded to the junior scientists at BU with total budget of 900000 EP. After completion of these projects, staff members were able to successfully obtain an external-funded projects with 7,300,000 EP from different funding bodies rather than BU such as Science technology and development fund (STDF). On the second call in 2014, 10 projects were funded with a total budget of 1,000,000 EP. Scholars at the second call were successfully granted a total of 6,172,000 EP from different funding organization. On the third call in 2015, SRF at BU granted 16 research projects with a total budget of 1,600,000 EP with a total fund supported by SRF was **3,500,000** EP. For whole three years, the total fund attained externally was **22,880,000** EP. These estimates indicating the success of BU in progressing the research capacity for getting some project scholars and for increasing the skills of writing the grant proposals.

Table 4. The impacts of SRF funding on young researchers in BU (less than 40 years old) from year 2013 up to year 2015

Year	Projects submitted	Projects accepted	Grant by SRF	Grants attained Externally
2013	20	9 Projects	900,000 EP	7,300,000 EP (STDF project)
2014	23	10 Projects	1,000,000 EP	5,000,000 EP (STDF project)
				5,710,000 EP (Excellence Project of Higher Education Institutions)
				450,000 EP (STDF project)
2015	36	16 Projects	1,600,000 EP	120,000 Euros of about 720,000 EP of TEMPUS project (International Bio-technology Master Degree)
2016	57	Under reviewing to accept 20 projects	2,000,000 EP	3,700,000 EP (STDF project)
Total	136	55 Projects	**5,500,000** EP	Total fund attained Externally = **22,880,000** EP

The improvement of BU in Webometrics ranking:

The Webometrics ranking (or Web Ranking) is the largest academic ranking of Higher Education Institutions (Aguillo et al, 2010a). Since 2004 and every six months, an independent, objective, free, open scientific exercise is performed by the Cybermetrics Lab (Spanish National Research Council, CSIC) for the providing reliable, multidimensional, updated and useful information about the performance of universities all-over the world based on their web presence

and impact (Aguillo et al, 2010b). This ranking depends on four major indicators; the impact, presence, openness and excellence (Aguillo et al, 2008). The first Web indicator, Web Impact Factor (WIF), was based on link analysis that combines the number of external inlinks and the number of pages of the website (Aguillo et al, 2009). The four indicators are obtained from the quantitative results provided by the main search engines where the size is the number of pages recovered from four engines: Google, Yahoo, and Bing Search. The visibility is the total number of unique external links received (Inlinks) by a site, according to Yahoo Site Explorer. The openness include the rich files after being evaluated for relevance to academic and publication activities and considering the volume of different file formats, the following were selected: Adobe Acrobat (.pdf), Adobe PostScript (.ps), Microsoft Word (.doc) and Microsoft PowerPoint (.ppt). These data are extracted using Google, Yahoo and Bing research. The excellence or Scholar (Sc) is a combination of items published between 2006 and 2010 included in Google Scholar and the global output (2004-2008) was obtained from Scimago SIR (Aguillo et al, 2005, 2006).

The marked improvement in the Google Scholar citations has been reflected on the progressive increase in the BU Webometrics ranking that was improved gradually staring from 10250 in 2011 to be 6120 in 2012, 2573 in 2013, 1590 in 2014, 1419 in 2015 and 1238 in January 2016. The national ranking was increased from the 34th position in 2012 to be the 3rd position in January 2016. However, Figure 4 showed that the Webometrics ranking of has been improved gradually staring from 10250 in 2011 to be 1238 in January 2016.

Table 4: Progress of Webometrics ranking of BU from 2011 to January 2016

Year	World ranking	Africa ranking	Arab World ranking	Egyptian Universities ranking
2011	10250	Not ranked	Not ranked	40
2012	6120	94	Not ranked	19
2013	2573	35	30	6
2014	1590	16	13	6
2015	1419	16	12	4
2016	1238	14	11	4

QS Ranking of BU:
In May 2015, the QS ranking for Arab world was announced when BU was ranked 81 over the Arab universities. Since then, the international students have been increased from 400 to be 6000 students from different countries in the Arab and Middle East area. Meanwhile, Beha University offered different rewards to staff members who achieve high score in citation and those published the scientific papers in high impacted journals indexed in Thompson Reuters. Because 50% of the QS ranking in Arab world is based on the feedback from academics and employers to evaluate the scientific reputation of the universities, BU has send a list of 400 academic professors belonging to different world universities in addition to 260 employers both nationally and internationally to help QS in collecting accurate data regarding the graduate

quality of BU. In addition, BU is currently applied to sign a contract with QS Company to subscribe in QS star system and to advice in advancing steps of BU online profile.

Conclusions:

Funding the staff members of BU by some research projects played an important role in progressing the building research capacities of the staff and improving the academic ranking of the University particularly in the Webometrics ranking. Increasing the funding of research projects for the staff members to be two hundred thousand of Egyptian pounds per project will increase the competitiveness with more improving in BU ranking.

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