Monitoring of downloads of Belgorod State University (Russia) scientists' publications by scientists from other countries

Seguimiento de las descargas de publicaciones científicas de la Universidad Estatal de Belgorod (Rusia) por científicos de otros países

Monitoramento de downloads de publicações de cientistas da Universidade Estadual de Belgorod (Rússia) por cientistas de outros países

Written by:
Vladimir M. Moskovkin[1], Marina V. Sadovski[1], Andrey P. Peresypkin[1], Yuliana Y. Genkin[2]
[1]Belgorod State University, 308015, Belgorod, Pobeda Street, 85, Russia,
E-mail: moskovkin@bsu.edu.ru
[2]Admiral F. F. Ushakov Novorossiysk State Maritime University, 353918, Novorossiysk, Lenin Prospect, 93, Russia

Abstract

The article presents a review on the functioning of the ResearchGate network and the growth of its popularity both from the literary data and from the experiments in the Google Scholar search engine. It describes a unique weekly monitoring experiments of downloads of Belgorod State University (Russia) scientists' publications by scientists from other countries (starting on 11.01.2015 through 20.12.2015), and it is shown that scientists from the United States (about 10,000 downloads in 2015) and China (about 6,000 downloads in 2015) are most interested in these publications. As a result we see very uneven inverse-square distribution of Belgorod State University publications by countries of the world. The total number of countries appeared to be 91.

Keywords: publication activity, the Belgorod State University, Russia, cross-correlation matrix, RG-metrics, RG Score, ResearchGate, Google Scholar.

Resumen

El artículo presenta una revisión sobre el funcionamiento de la red ResearchGate y el crecimiento de su popularidad tanto a partir de los datos literarios como de los experimentos en el motor de búsqueda Google Scholar. Describe experimentos únicos de monitoreo semanales de descargas de publicaciones de científicos de la Universidad Estatal de Belgorod (Rusia) por científicos de otros países (desde el 11.01.2015 hasta el 20.12.2015), y se muestra que científicos de los Estados Unidos (aproximadamente 10.000 descargas) en 2015) y China (aproximadamente 6.000 descargas en 2015) están más interesados en estas publicaciones. Como resultado, vemos una distribución muy desigual de casillas inversas de las publicaciones de la Universidad Estatal de Belgorod por países del mundo. El número total de países parecía ser 91.

Palabras clave: actividad de publicación, la Universidad Estatal de Belgorod, Rusia, matriz de correlación cruzada, RG-metrics, RG Score, ResearchGate, Google Scholar.

Resumo

O artigo apresenta uma revisão do funcionamento da rede ResearchGate e o crescimento de sua popularidade a partir de dados literários e de experimentos no mecanismo de busca do Google Scholar. Somente experimentos descrito descarga monitoramento publicações semanais de cientistas da Universidade Estadual de Belgorod (Rússia) por cientistas de outros países (a partir de 2015/11/01 a 2015/12/20), e mostra que os cientistas dos Estados Unidos (aproximadamente 10.000 downloads) em 2015) e China (aproximadamente 6.000 downloads em 2015) estão mais interesados nessas publicações.

Como resultado, vemos uma distribuição muito desigu al de quadrados inversos das publicações da Universidade Estatal de Belgorod por países do mundo. O número total de países parecia ser de 91.
Palavras-chave: atividade de publicação, Universidade Estadual de Belgorod, Rússia, matriz de correlação cruzada, Métrica RG, RG Score, ResearchGate, Google Scholar.

Introduction

Currently, there are three popular social networks for scientists. They are ResearchGate, Mendeley and Academy.edu. Their functioning review was published by Richard van Norden in his "Online Collaboration: Scientists and the Social Network" in the Nature magazine in 2014, which showed the advantage of the ResearchGate (RG) network over the other two (Van Noorden, 2014). This network was launched in 2008 and by 2016 the number of users has reached 8 million people (Memon, 2016). The popularity and importance of this network is evidenced by the fact that Bill Gates and others have recently invested $35 million in it (Hoffmann et al, 2016).

The experiment with Google Scholar advanced search in the "exact phrase" line when testing the term "ResearchGate" gave 233 relevant responses with this term being present in the title of each publication (the search was done on June 7, 2016). Similar experiment was conducted on 19.07.2018 and revealed 457 relevant responses. As we see from these experiments, the researchers' interest to this academic network is growing.

Below we give an overview of the most significant publications obtained as a result of the last experiment. The advantages of social academic networking are described in the publication (Ovadia, 2014) using the networks ResearchGate and Academia.edu as an example. In publications (Alheyasat, 2016; Alheyasat, 2015) the neural networks and the Graph Theory were used to establish various relationships between the indicators generated by the ResearchGate network. The neural networks were used in the publication (Alheyasat, 2016) to establish regressional links between the number of followers and the users activity indicator (RG Score) in the ResearchGate network. The best correlation was seen between the number of publications, the overall impact factor, viewings of the publications and their citation. The worst has been established between the number of questions asked and replies given in the process of discussions. To analyze this in June 2013 the data on nearly 1 million users were collected. In order to use the Graph theory tool the data on 59579 users of this network were collected in November 2013, what is shown in the second article of this author. The average values of the number of responses per user (8.5) and per one question (6.1) were obtained (Alheyasat, 2015).

For 300 members of the ResearchGate network from 8 countries with RG Score over 3.0 engaged in natural science and medical science researches (SCM) and having 14,450 followers the correlation calculations between six RG and three QS metrics, and also between the first metrics and two SciVal metrics were performed in the publication (Yu, M.-Ch et al, 2016). The calculations showed a good correlation with RG and QS-metrics ($r = 0.528 - 0.667$) and poor correlation with SciVal-metrics ($r = 0.195 - 0.238$).

A comparative analysis on the participation of three Iranian universities from the city of Ahavz within the ResearchGate network is given in the publication (Reza, A.A et al, 2015) presenting calculations of both traditional and alternative (RG) metrics. The conclusion was made that it is necessary to conduct training seminars on social academic networking, which should help to increase the scientific status of scientists.

As shown in publication by M. Thelwall and K. Kousha, the ranking of academic institutions in the ResearchGate network correlates good enough with the known rating of these institutions (Thelwall & Kousha, 2015). This network reflects well the traditional distribution of academic assets. However, while Brazil, India and number of other countries have disproportionate advantages in this network, such countries as China, South Korea and Russia still do not use all the opportunities this network could provide to maximize the scientific impact of their publications. 31,000 organizations with profiles in ResearchGate were identified in October 2013 and the country-specific values of the number of documents in this network were calculated per publication in the Web of Science database (the USA - 14.2, China - 3.8, Russia - 4.2).

Another publication by the same authors (Thelwall & Kousha, 2017) gives us some number of unique experiments performed with this network. For 28 days in January and July 2014, as well as in January 2015, all articles published from 1990 to 2015 inclusive were downloaded. For example, while downloading in July 2014, only 400 articles published in 1990 were available but articled published in 2014 – about 3800. The total number of articles published for a quarter of a century in the ResearchGate network was found as 68,731. When the publications with DOI were broken down into categories (total of 14,789 publications) the first place was taken by publications in medical field, followed by publications on physics and astronomy. Publications in the field of biochemistry, genetics and molecular biology finished in third. The contribution to the RG Scoring system by the Publications (%), Answers (%), Questions (%) and Followers (%) for 26 scientists with RG Score of 100 and over was studied in publication (Orduna-Malea et al, 2017). It turned out that the greatest contribution to the RG Score was made by Answers, the second place with rather large backlog was taken by Publication. A cross-correlation matrix between RG-metrics (n = 104) was presented. Rather poor negative correlation was observed between RG Score and Publications as well as the Citation metrics, while at the same time the best correlation was observed with such metrics as Answers (r = 0.61) and Profile Views (r = 0.42). The opposite result was obtained by constructing the cross-correlation matrix (n = 65) for 25 Nobel prize winners. The best RG Score correlation here turned out to be with Publications (r = 0.87) and Citation (r = 0.68) (Orduna-Malea et al, 2017), which was obviously predictable.

In publication (Nicholas et al, 2015) the survey of nearly 100 scientists from France, Switzerland, Spain and Poland in four different fields of knowledge was conducted, which showed that those scientists, depending on their country and area of expertise, varied greatly in their use of capabilities of such new reputable platforms as ResearchGate and Mendeley.

There are also studies that are critical to the ResearchGate network. For example, publication (Kraker & Lex, 2015) draws our attention to non-transparency of RG Scoring system and its disability to replicate and reconstruct itself. It is also pointed out in publication (Memon, (2016) that in recent years the network administration has become quite tolerant in its policies by letting predatory journals feel free in that environment. It is assumed that authors themselves are not aware of the quality and reputation of the journals and magazines in which their articles are being published, and consequently, the article published in the predatory journals becomes equally visible on the ResearchGate, as it was published in one well reputable journal (Memon, 2016).

In publication (Guskov et al, 2018) it is noted that the developers of ResearchGate network pursue a very unstable master data management policy, which leads to the inability to use this system as a scientometric data source. This article also contains data on how well the Russian scientific organizations are represented in this network. It is noted that only one out of four scientific organization in Russia is represented there and no more than 12% of all scientists of those represented organizations have placed their information in this network. No more than 8.2% of all publications of those scientists are present on ResearchGate platform.

Our experience with this network proves that it is convenient for conducting meaningful discussions to find partners for future joint research projects and publications or for collection of initial empirical material for a new study. For example, we managed to find out what kind of intensive publication strategies are used in different countries and their universities, which formed the basis for the publication (Moskovkin et al, 2013).

The ResearchGate network allows scientists to follow how their publications are being viewed and downloaded on daily and weekly basis, and which of the leading countries and scientific institutions download your articles. The network calculates your personal ranking (RG Score) depending on the number of your publications, their relevance, the discussion activity, etc. Unfortunately, the method of calculation is not described. We note, that previously the Total Impact (the total impact factor of the journals in which the author's articles were published) was calculated using the Web of Science database. Currently the general Citation rate (Citation impact) and the Hirsch Index (H-Index) have been introduced instead. This platform is very useful for all scientists, and it is very important that the articles uploaded to it are quickly indexed by the Google Scholar search engine.

Our research review on the activity of scientists in the academic network ResearchGate showed the lack of publications on the study of external downloads of academic documents placed by researchers of any organization in this network, with their distribution across countries and time intervals.

Here below, we will present the results of our weekly monitoring experiments of downloads of Belgorod State University (Russia) scientists' publications by scientists from other countries during 2015.

Materials and methods of research

To study the effectiveness activity of Belgorod State University scientists in the ResearchGate network we monitored the publication activity of our leading scientists with RG Score of more than 10 on a weekly basis in 2015.

The interim XLS tables we obtained were complex and dynamic, as the data changed daily (monitoring was made weekly). Each XLS table consisted of one summary table and a series of interim tables that reflected each week. The three ResearchGate.xls summary tables, which were separated from each other by tabs, contained 15 variables: RG Score, Impact Points, Following, Publications, Full-texts, Articles, Chapters, Conference papers, Books, Datasets, Patents, Downloads, Views, Citations, (Downloads/Views) * 100, %.

All variables were cumulative for a certain time (date) in each summary table. So the first tab was made for the time period starting January 11 till July 26, 2015; the second tab was made for the time period starting August 2 till September 27, 2015 and the third tab covered the period from October 4 till December 20, 2015.

From 6 to 8 variables were represented in our interim tables: there were 8 variables in the tables of the first two tabs and 6 variables in the tables of the third one. This was due to the fact that on October 4, 2015 the developers of the ResearchGate network have replaced two such indicators as Downloads and Views by one indicator Reads. In the first two tabs the data on the number of downloads from the scientists of the first five countries were followed by three variables monitored weekly: total weekly Downloads, Views, (Downloads/Views) * 100, % (calculated by us), and in the third tab only one weekly variable follows the downloads from scientists of the first five countries: the weekly number of Reads.

In these interim tables, the above 6-8 variables were obtained on a weekly basis (50 weeks surveyed).
All six variables were cumulative in the EXEL table RGScore.xls for the Dec.21, 2015: RG Score, Percentile, Publications, Questions, Answers and Followers. 50 RG Score values were incorporated for all 50 weeks in the interim tables. Based on the above-mentioned EXEL tables, the WORD tables were compiled. We also constructed cross-correlation matrixes between RG-metrics. The current publication is to summarize our results for the year 2015 on the weekly monitoring of external downloads of articles of Belgorod State University scientists by scientists from other countries on the Research Gate platform.

Results and Discussion

Table 1 shows an example of a typical table for weekly downloads and article views by country and in general. The date 11.01.15 means that the data on the downloads of articles from the scientists of the first five countries and in general on downloads and views were collected for the week preceding this date. In the last column of this table the specific index (Downloads/Views) * 100, % has been calculated. We can see from this table that the greatest interest in the publications of leading scientists of the Belgorod State University is shown by the US scientists, followed by Chinese scientists. Note that the number of Belgorod State University scientists with RG Score of more than 10 has changed from 37 (Table 1) to 41. The data for those 50 weekly tables for the year 2015 were summarized.

Table 1- Example of weekly monitoring of Belgorod State University scientists' articles downloads by country and in general

№	Full Name	Downloads by country 11.01.15					D	V	ρ
1	Rustam Kaibyshev	USA-44	China-9	India-5	Germany-2	Russia-2	89	138	64.49
2	Maxim P Evstigneev	USA-62	China-12	Ukraine-7	India-4	Jordan-2	95	100	95.00
3	N.N. Nasonov	USA-10	China-1				10	44	22.73
4	Andrey Belyakov	USA-12	Japan-1	China-1	Bangladesh-1	India-1	18	54	33.33
5	V.S. Zakhvalinskiĭ	USA-31	China-8	Japan-1	Russia-1	Kazakhstan-1	40	67	59.70
6	Vladimir M Moskovkin	USA-29	China-8	UK-1	Australia-1		37	49	75.51
7	I.E. Vnukov	USA-10	China-1	Russia-1			12	31	38.71
8	Sergey Zherebtsov	USA-16					16	14	114.29
9	Mikhail Churnosov	USA-15	Russia-9	China-4	Columbia-4	Germany-3	42	54	77.78
10	Sergey Vladimirovich Blazhevich	China-2	USA-2				4	16	25.00
11	Dmitro Kolesnikov								
12	Anatoly S. Buchelnikov	USA-9	Ukraine-2	China-1			12	22	54.55
13	Vladislav Syshchenko	USA-5	Chian-1	Romania-1			7	9	77.78
14	Alexander Kubankin	USA-2					2	15	13.33
15	Lisetskii Fedor	USA-28	China-4	Greece-2	Russia-2	Portugal-1	37	21	176.19
16	Boris Paponov								
17	A.V. Kuznetsov	USA-2	China-1				3	15	20.00
18	Olga E. Lebedeva	USA-1					1	4	25.00
19	N.D. Stepanov	USA-2	China-1				3	15	20.00
20	Nadezhda Dubova	USA-7	China-1	Germany-1	Israel-1	India-1	11	21	52.38
21	Maxim Ivanov	USA-1					1	10	10.00
22	S.S. Malopheyev	India-4	USA-2	China-1	Russia-1		8	12	66.67
23	D.G. Shaysultanov	USA-2	China-1				3	9	33.33
24	Olga Efremova	USA-2					2	4	50.00
25	A.V. Glushak								
26	Marat Gazizov	Russia-1					1	9	11.11
27	Daria Zhemchuzhnikova								
28	Kovaleva Marina								
29	N. V. Malai								
30	N.A. Chekanov	Ukrine-2	USA-2	Russia-1			5	14	35.71
31	A.A. Mogucheva	USA-3	Italy-1				4	10	40.00
32	Marina Tikhonova								
33	R. Magomedshapievic Nazhmudinov								
34	Yu.G. Chendev	USA-6	Belgium-1	France-1	China-1		9	19	47.37
35	Alexandr Ivanovich Vezentsev								
36	Valeriy Dudko	USA-1					1	12	8.33
37	M. S. Prozorova								

Note: D – the total weekly number of articles downloads by foreign scientists from the five countries; V – total weekly number of articles views by foreign scientists from the five countries; $\rho=(D/V)*100$, %

Based on these data the summary table by country (Table 2) and a weekly downloads table (Table 3) were compiled.

From Table 2 one can clearly define the first ten downloading countries: the USA - 10027, China - 6018, Russia - 2337, India - 642, Ukraine - 481, Germany - 387, France - 286, Iran - 199, Poland - 159, Finland - 142. These are exact the first ten countries whose scientists most actively follow the articles of their colleagues from Belgorod State University.

From Table 3 one can see that the weekly external downloading rate ranges from 186 to 804 with an average value of 452.2 and a standard deviation of 119.51.

Table 2 - Final annual data of external downloads of publications of Belgorod State University scientists on the Research Gate platform in 2015 by country

№	Country	Number of downloads of articles	№	Country	Number of downloads of articles	№	Country	Number of downloads of articles
1	USA	10,027	31	Egypt	25	62	Albania	2
2	China	6,018	32	Canada	63	63	Nigeria	6
3	Russia	2,337	33	Spain	48	64	Morocco	5
4	India	642	34	South Korea	105	65	Vietnam	71
5	Germany	387	35	RSA	21	66	Norway	14
6	France	286	36	Finland	142	67	Croatia	4
7	Italy	118	37	Mexico	23	68	Pakistan	42
8	Ukraine	481	38	Lithuania	13	69	Slovakia	13
9	Japan	118	39	Indonesia	116	70	Georgia	3
10	Jordan	2	40	Armenia	1	71	Mongolia	2
11	UK	140	41	Luxembourg	5	72	New Zealand	2
12	Australia	32	42	Serbia	23	73	Bulgaria	12
13	Austria	15	43	Hong Kong	7	74	Saudi Arabia	14
14	Colombia	12	44	Poland	159	75	Latvia	8
15	Romania	55	45	Philippines	13	76	Syria	4
16	Greece	14	46	Singapore	18	77	Botswana	1
17	Portugal	10	47	Tunisia	28	78	Thailand	7
18	Israel	19	48	Zambia	7	79	Ecuador	4
19	Belguim	26	49	Trinidad & Tobago	1	80	UAE	3
20	Bangladesh	2	50	Czech Republic	40	81	Argentina	7
21	Kazakhstan	26	51	Iraq	9	82	Azerbaijan	5

№			№			№		
22	Belarus	33	52	Ghana	1	83	Chile	2
23	Algeria	36	53	Taiwan	64	84	Kenya	2
24	Iran	199	54	Brasil	111	85	Ethiopia	23
25	Switzerland	13	55	Zimbabwe	18	86	Estonia	9
26	Sweden	30	56	Turkey	40	87	Peru	2
27	Netherlands	39	57	Bolivia	1	88	Cyprus	1
28	Denmark	46	58	Sri Lanka	2	89	Ireland	1
29	Moldova	22	59	Hungary	9	90	Uzbekistan	1
30	Slovenia	7	60	Costa Rica	6	91	Uruguay	2
			61	Malaysia	27			

Table 3 - Final weekly numbers of external downloads of publications of Belgorod State University scientists on the Research Gate platform in 2015

№	1	2	3	4	5	6	7	8	9	10
Week	04 – 11.01	11 – 18.01	18 – 25.01	25 – 01.02	01 – 08.02	08 – 15.02	15 – 22.02	22 – 01.03	01 – 08.03	08 – 15.03
Number of downloads of articles	429	424	478	239	412	503	516	464	356	373
№	11	12	13	14	15	16	17	18	19	20
Week	15 – 22.03	22 – 29.03	29 – 05.04	05 – 12.04	12 – 19.04	19 – 26.04	26 – 03.05	03 – 10.05	10 – 17.05	17 – 24.05
Number of downloads of articles	416	449	484	516	381	404	354	432	399	352
№	21	22	23	24	25	26	27	28	29	30
Week	24 – 31.05	31 – 07.06	07 – 14.06	14 – 21.06	21 – 28.06	28 – 05.07	05 – 12.07	12 – 19.07	19 – 26.07	26 – 02.08
Number of downloads of articles	369	417	430	524	756	663	804	569	724	186
№	31	32	33	34	35	36	37	38	39	40
Week	02 – 09.08	09 – 16.08	16 – 23.08	23 – 30.08	30 – 06.09	06 – 13.09	13 – 20.09	20 – 27.09	27 – 04.10	04 – 11.10
Number of downloads of articles	582	487	531	401	465	567	503	541	314	505
№	41	42	43	44	45	46	47	48	49	50
Week	11 – 18.10	18 – 25.10	25 – 01.11	01 – 08.11	08 – 15.11	15 – 22.11	22 – 29.11	29 – 06.12	06 – 13.12	13 – 20.12
Number of downloads of articles	468	403	368	333	300	304	499	366	481	369

Now we convert Table 2 into a ranked table 4 and based on it we can build the distribution curve for the external downloads of publications of Belgorod State University scientists by countries (Fig. 1). Here the x-axis corresponds to countries (for example, x = 1 - USA, x = 21 – Spain) and y-axis represents the number of external downloads.

Table 4 - Distribution of external downloads of Belgorod State University scientists' publications by countries on the Research Gate platform in 2015

	Country	Number of downloads of articles	№	Country	Number of downloads of articles	№	Country	Number of downloads of articles
1	USA	10027	31	Tunisia	28	62	Thailand	7
2	China	6018	32	Malaysia	27	63	Argentina	7
3	Russia	2337	33	Belguim	26	64	Costa Rica	6
4	India	642	34	Kazakhstan	26	65	Nigeria	6
5	Ukraine	481	35	Egypt	25	66	Luxembourg	5
6	Germany	387	36	Mexico	23	67	Morocco	5
7	France	286	37	Serbia	23	68	Azerbaijan	5
8	Iran	199	38	Ethiopia	23	69	Croatia	4
9	Poland	159	39	Moldova	22	70	Syria	4
10	Finland	142	40	RSA	21	71	Ecuador	4
11	UK	140	41	Israel	19	72	Georgia	3
12	Italy	118	42	Singapore	18	73	UAE	3
13	Japan	118	43	Zimbabwe	18	74	Jordan	2
14	Indonesia	116	44	Austria	15	75	Bangladesh	2
15	Brasil	111	45	Greece	14	76	Sri Lanka	2
16	South Korea	105	46	Norway	14	77	Albania	2
17	Vietnam	71	47	Saudi Arabia	14	78	Mongolia	2
18	Taiwan	64	48	Switzerland	13	79	New Zealand	2
19	Canada	63	49	Lithuania	13	80	Chile	2
20	Romania	55	50	Philippines	13	81	Kenya	2
21	Spain	48	51	Slovakia	13	82	Peru	2
22	Denmark	46	52	Colombia	12	83	Uruguay	2
23	Pakistan	42	53	Bulgaria	12	84	Armenia	1
24	Czech Republic	40	54	Portugal	10	85	Trinidad & Tobago	1
25	Turkey	40	55	Iraq	9	86	Ghana	1
26	Netherlands	39	56	Hungary	9	87	Bolivia	1
27	Algeria	36	57	Estonia	9	88	Botswana	1
28	Belarus	33	58	Latvia	8	89	Cyprus	1
29	Australia	32	59	Slovenia	7	90	Ireland	1
30	Sweden	30	60	Hong Kong	7	91	Uzbekistan	1
			61	Zambia	7		Total	22,610

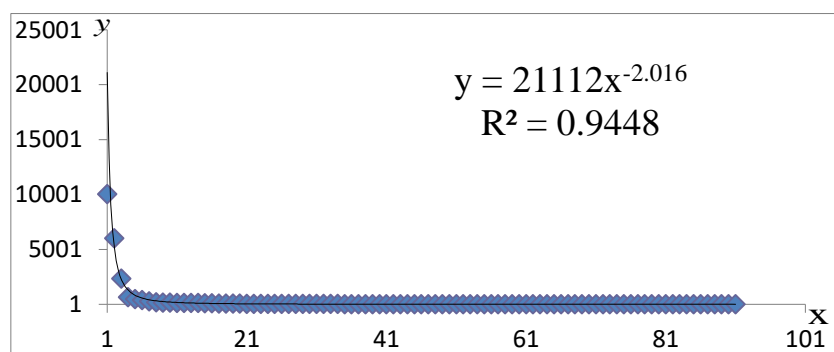$$y = 21112x^{-2.016}$$
$$R^2 = 0.9448$$

Figure 1 – Distribution curve of external downloads of the Belgorod State University scientists' publications by country on the Research Gate platform in 2015

A very good inverse-quadratic distribution with a high determination ratio has been obtained from this curve. In addition, for Table 4, we can show how well this distribution complies with the Pareto principle. To do this, we should calculate how many downloads were made by the first 20% of the all countries (18 countries). There were 21,521 downloads (92.2%). That is, we got a distribution much more polarized than the Pareto distribution.

The weekly distribution of external downloads of publications of Belgorod State University scientists (from the first week to the fiftieth) is shown in Figure 2. Apparently, this distribution has a nearly zero trend. In addition, it should be mentioned that this distribution is close to normal.
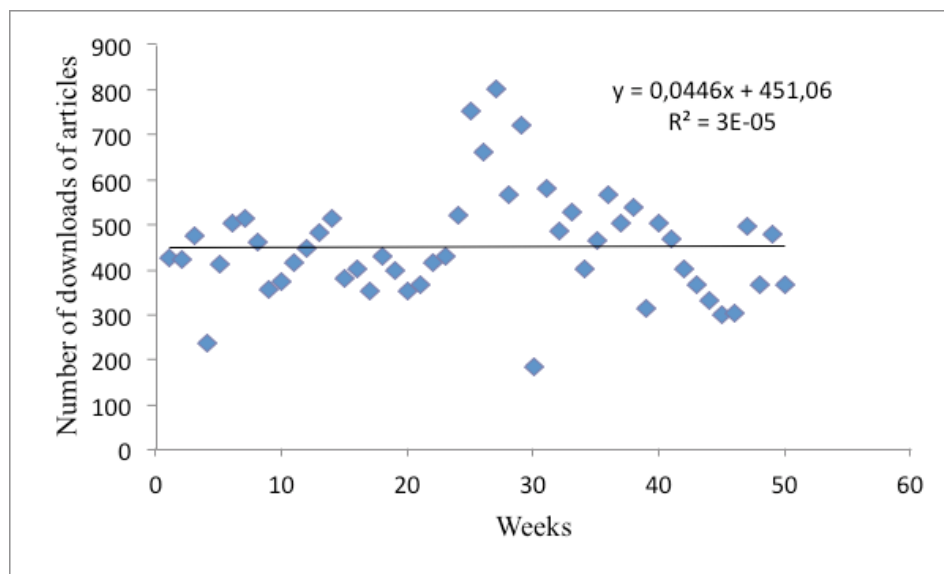

Figure 2 – Weekly distribution of external downloads of Belgorod State University scientists' publications on the Research Gate platform in 2015

Conclusion

Thus, we have established that an impressive proportion of all external downloads of Belgorod State University publications was made by colleague scientists from the USA and China while the distribution itself of these downloads by countries occurs according to the Inverse-square law with a very good determination rate. The first 20% of all countries (18 countries) account for a much higher percentage of external downloads (92.2%), which requires the Pareto distribution . The weekly dynamics of external downloads had nearly zero trend and distribution close to normal.

REFERENCES

Alheyasat, O. (2015). Examination Expertise Sharing in Academic Social Networks Using Graphs: The Case of ResearchGate, Contempory Engineering Science, 8(3): 137-151.

Alheyasat, O. (2016). Investigation and Analysis of ResearchGate User's Activities using Neural Networks. The International Arab Journal of Information Technology, 13(2): 320 – 325.

Guskov, A.E., Kosyakov, D.V., Grigoriev, A.V., Sergeev, A.E. (2018). Ispolzuyut li rossiyskie uchenye sovremennye technologii nauchnyh kommunikatsyi? (Do Russian scientists use modern technologies of scientific communications?). Vestnik Novosibirsk State University. Informatsyonnye tehnologii, 16(1): 74-84 (In Russian).

Hoffmann, C. P., Lutz, C., Meckel, M. A. (2016). Relational Altmetric? Network Centrality on ResearchGate as an Indicator of Scientific Impact. Journal of the Association for Information Science and Technology, 67(4): 765-775.

Kraker, P., Lex, E. A Critical. (2015). Look at the ResearchGate Score as a Measure of Scientific Reputation. Proceedings of the Quantifying and Analysing Scholarly Communication on the Web workshop (ASCW'15), Web Science conference.

Memon, A. R. (2016). ResearchGate is no Longer Reliable: Leniency towards Ghost Journals May Decrease its Impact on the Scientific Community J Pak Med Assoc, 66(12): 1643-1647.

Moskovkin, V.M., Peresypkin A.P., Pupynina, E.V. (2013). Izuchenie osobennostey mezhdunarodnyh praktik po vyplate voznagrazgdeniy za nauchnye publikatsii c pomotschyu platformy ResearchGate i personalnoi kommunikatsii. Predvoritelnye resultaty (The study of international practicies of rewards for scientific publications with the help of ResearchGate platform and through personal communication). Belgorod State University Scientific Bulletin. Philosophy. Sociology. Law, 25 (16 (159)): 257-261 (In Russian).

Nicholas, D., Herman, E., Jamali, H. R., Bravo, B. R., Boukacem-Zeghmouri, C., Dobrowolski, T., Pouchot, S. (2015). New ways of building, showcasing, and measuring scholarly reputation. Learned publishing, 28(3): 169-183.

Orduna-Malea, E., Martín-Martín, A., Thelwall, M., López-Cózar, E. D. (2017). Do ResearchGate Scores Create Ghost Academic Reputations? Scientometrics, 112(1): 443-460.

Ovadia, S. (2014). ResearchGate and Academia.edu: Academic Social Networks. Behavioral and Social Sciences Librarian, 33(3): 165-169.

Reza, A.A., Maryam, S., Mehdi, S.B., Abedin, H.A.S. (2015). Presence of Ahavz Universities (Medical Science, Azad and Governmental) Scholars Iranian Library and Information Science Scholars in Academic Social Networks: ResearchGate. Educational Development of Jundishapur, 6(1): 67 – 73.

Thelwall, M., Kousha, K. (2015). ResearchGate: Disseminating, Communicating, and Measuring Scholarship? Journal of the Association for Information Science and Technology, 66(5): 876-889.

Thelwall, M., Kousha, K. (2017). ResearchGate articles: Age, Discipline, Audience Size, and Impact. Journal of the Association for Information Science and Technology, 68(2): 468-479.

Van Noorden, R. (2014). Online collaboration: Scientists and the Social Networks. Nature, 512(7513): 126-129.

Yu, M.-Ch., Wu, Y.-Ch.J., Alhalabi, W.,Kao, H.-Y. (2016). ResearchGate:An Effective Altmetric Indicator for Active Researchers? Computer in Human Behavior, 55: 1001 – 1006.