

RANKING OF UNIVERSITIES IN ROMANIA AND THE EMERGING DISORIENTATION

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Abstract. *The paper analyses the place held by Valahia University of Targoviste (UVT) in the university top rank in Romania between 2002-2011, its rank in accordance with the new Law of Education, its position in the WEB international placement rank as well as some discrepancies related to all these. The paper also discusses the development of disciplines in the domain of Mathematics, Physics and Chemistry within UVT, related ISI publications and connected issues.*

Keywords: *research, Scientometrics, Hirsch index, universities ranking, domain ranking.*

1. INTRODUCTION

Within the broader framework of the knowledge-based economy in an information society, the activity of the scientific research represents a strong factor of development which follows realistic, innovating programmes conceived by reputed specialists. Science does not mean simply swelling with national pride, it is a form of adjustment to a globalized society in which intelligence and innovation are as precious and valuable as natural resources [1]. In order to quantify the results of scientific research we can resort to the scientometric methods used in international current practice.

Of the 42,363 people involved in doing scientific research in Romania at the beginning of the year 2012, as many as 19,461 came from higher education [2]. Therefore, university scientific research can be rightly considered one of the main supporting foundations of the Romanian socio-economic development. As early as December 1st, 2010, the world population had risen to 7,082,194,475 people [3], while Europe had reached 738,523,843 [4].

The number of universities worldwide is 17,036 [5], while Europe has 1,858 universities [6]. As a result, Romania should have about 52 universities for its 21,39 million inhabitants [6]. However, the number of Romanian universities is actually much higher.

Since the world population is going to grow as shown by the data in Figure 1 / by the year 2083 it is expected to have reached 10 billion people [7] – it means that this new situation will call for a reconsideration of the number of universities.

Therefore, at least from this perspective, university scientific research is likely to become stronger and stronger.

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2. EXPERIMENTAL

To calculate Hirsch index from the total number of published papers only, we have employed Anthony van Raan's relation [8]:

$$h = 0.73 \cdot P^{0.52} \quad (1)$$

where h is the Hirsch index and P represents the total number of papers.

The SCImago Journal & Country Rank site was used to obtain the Hirsch index of some academic journals and/or countries.

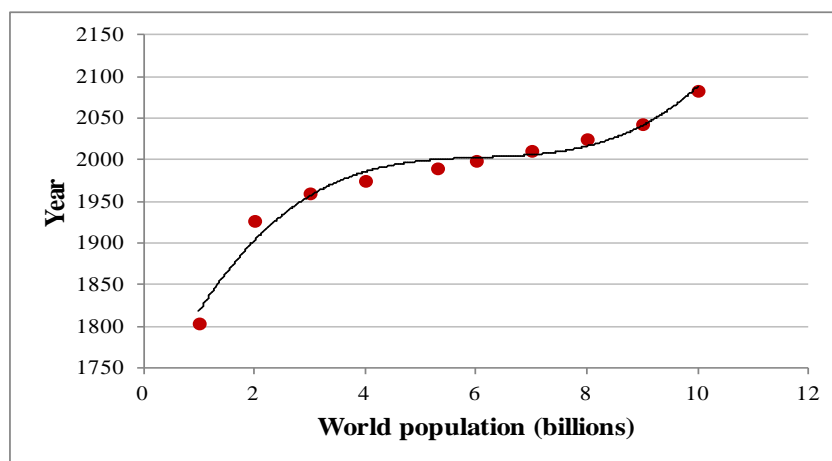


Fig. 1. World population growth (as per data [7]).

3. RESULTS AND DISCUSSIONS

The ranking of Romanian universities over 2006-2007 places UVT in position 10, respectively 7. These rank placements (tables 1 and 2) are based on the number of scientific papers in relation to the number of the university's teaching staff members [9, 10]. Following the rector's continual and persistent demands, Ad Astra has changed the university ranking methodology and thus, UVT ranks as shown in table 3.

Web's ranking of Romanian universities, performed several times this year, has placed UVT in position 20 [11], 21 [12] and respectively 25 [13]. UVT's placement in the world rank is 2809 [12].

Table 1. Top rank universities in Romania (2006) [9].

Position	University	Papers per 100 teaching staff members	Papers	Teaching staff members
1	"Alexandru Ioan Cuza" University, Iasi	25.61	221	863
2	University of Bucharest	23.83	352	1,477
3	"Babes-Bolyai" University, Cluj-Napoca	21.32	269	1,262
4	"Politehnica" University of Bucharest	15.63	258	1,651
5	"Gh. Asachi" Technical University, Iasi	12.18	115	944
6	West University of Timisoara	10.38	71	684
7	"C. Brancusi" University, Targu Jiu	8.57	12	140
8	"Politehnica" University, Timisoara	7.81	69	883
9	Petroleum and Gas Engineering University, Ploiesti	7.63	27	354
10	"Valahia" University, Targoviste	7.46	25	335

A number of important academic events occurred in the recent past years. For instance, many universities elected their governing bodies. The old age of the teaching staff as well as the provisions of the current laws in force limited the participation of university professors in the elections for the leadership positions in their universities. Moreover, the unexpectedly imposed retirement of professors at the age of 65 was put into effect at the same time.

Table 2. Top rank universities in Romania (2006) [10].

Position	University	Papers per 100 teaching staff members	Papers	Teaching staff members
1	“Alexandru Ioan Cuza” University, Iasi	31.87	275	863
2	“Babes-Bolyai” University, Cluj-Napoca	24.01	303	1,262
3	University of Bucharest	21.26	314	1,477
4	“Politehnica” University of Bucharest	18.84	311	1,651
5	“Gh. Asachi” Technical University, Iasi	11.86	112	944
6	West University of Timisoara	11.84	81	684
7	“Valahia” University, Targoviste	9.85	33	335
8	“Politehnica” University, Timisoara	9.51	84	883
9	Technical University Cluj-Napoca	8.57	55	642
10	University of Craiova	6.65	66	993

Table 3. UVT's position in the new Ad-Astra Ranking.

Year	Number of papers per Romanian universities	The Hirsch-index of Romanian universities	UVT's position in Ad-Astra rank
2002	1317	30.58	20
2003	1698	34.90	18
2004	1557	33.36	17
2005	1939	37.39	15
2006	2216	40.08	15
2007	2222	40.14	18
2008	4786	59.82	22
2009	5605	64.95	30
2010	5644	65.18	15
2011	3403	50.10	17
2002-2011	30387	156.43	18

In all this meantime, Ad-Astra Association would write “conquer Romania's universities” [14]. Professor Andrei Marga said: “It is indeed reckless and discriminatory to compel outstanding university professors to put on end to their activity, at, at the age of 65...” Germany, Italy, France etc., used to do this for a while, but they abandoned it for the American solution of unlimitedly employing those professors who are genuine specialists and whose work is outstanding...” [15].

Another inconsistency comes from the very practical application of the new Law of Education. According to this, the ranking of universities was done following three directions, which are:

1. Advanced research and education universities;
2. Scientific research and education universities;
3. Education-focused universities.

UVT falls into group 3 despite the fact that, from many points of view, a number of universities in groups 1 and 2 have a scientific outcome which is below group 3 (table 4). As

shown above, the 15 universities in groups 1 and 2 in the table above have scientific performances and implicitly Hirsch indices which are lower than those of UVT's. This generates both a state of discontent regarding the assessment of the scientific research outcome and the fear of being underestimated in the competition for research contracts. To this effect, Professor Andrei Marga stated: "There is a great injustice in the ranking of universities. The first value group has entries based on other criteria than actual value. In the second and third groups the injustice is even greater". As for the criteria used, the professor says that: "they are a mixture of local tradition and biased evaluation" [17, 18].

Table 4. Disagreement between some universities' scientific performance and their placement in the university ranking according to the law.

Group	University	No. of papers 2002-2011	Hirsch index
Group 1	University of Agricultural Sciences and Veterinary Medicine, Cluj-Napoca	231	12.37
	"Lucian Blaga" University, Sibiu	253	12.97
	University of Agricultural Sciences and Veterinary Medicine, Bucharest	214	11.88
	University of Agricultural Sciences and Veterinary Medicine, Timisoara	181	10.89
	University of Agricultural Sciences and Veterinary Medicine, Iasi	80	7.12
	Civil Engineering University, Bucharest	160	10.22
	University of Medicine and Pharmacy, Targu-Mures	185	11.02
	Military Technical Academy	33	4.49
Group 2	"Henri Coanda" Air Force Academy, Brasov	14	2.87
	"Carol I" National Defense University, Bucharest	2	1.04
	"Mircea cel Batran" naval Academy, Constanta	30	4.27
	"N. Balcescu" Terrestrial Forces Academy, Sibiu	11	2.54
	National Arts University of Bucharest	12	2.65
	"Ion Mincu" University of Architecture and Urbanism, Bucharest	7	2.00
	"George Enescu" Arts University, Iasi	3	1.29
Group 3	"Valahia" University, Targoviste	381	16.04

The military universities presented in table 4 hold, according to the international ranking, positions ranging between 6,223 ("Carol I" National Defense University, Bucharest) and 16,342 ("Mircea cel Batran" Naval Academy, Constanta) [22]. We could rightly challenge the presumptuous attitude of a graduate from the latter university who dares to ask why the first-rank university in Romania ("Alexandru Ioan Cuza" University of Iasi) occupies position 602 and not one below 500.

All the other universities given in table 4 are placed in positions between 3,502 (The Civil Engineering University, Bucharest) and 11,174 ("Ion Mincu" University of Architecture and Urbanism, Bucharest).

Despite of these findings, UVT (group 3) is in a better position within the international ranking in comparison with the aforementioned universities in the table above; consequently, we are entitled to ask ourselves what kind of criteria were used to establish the national ranking. Part of the answer comes from Professor Andrei Marga [17, 18]. The same professor pointed out that "the score obtained mirrors the concept of quality that the ranking institution develops" [23].

In accordance with this ranking, UVT's least appreciated study programmes, marked by E, are considered to be those in Mathematics and Physics [24], while Chemistry and other 22 areas are regarded as average studies (C). There is a total contradiction between this situation and the domain top-ranking of Romanian universities over the period under study, that is:

1. Top-ranking of universities in Romania – domain ranking – 2011 – Mathematics, where UVT occupies position 6 [25];
2. Top-ranking of universities in Romania – domain ranking – 2011 – Applied Mathematics, where UVT occupies position 5 [26];
3. Top-ranking of universities in Romania – domain ranking – 2011 – Physics, where UVT occupies position 16 [27];
4. Top-ranking of universities in Romania – domain ranking – 2011 – Applied Physics, where UVT occupies position 15 [28];
5. Top-ranking of universities in Romania – domain ranking – 2011 – Atomic molecular and chemical Physics, where UVT occupies position 6 [29].

Such inability is characteristic of incompetent or ill-willed people. “From the very beginning the universities expressed their dissatisfaction with the way in which the ranking was done. The rectors blame the absence of transparency of the ranking criteria and, further on, claim that this affects both the image of the universities and the related funding from the state budget” [30].

The National Alliance of the Students' Organizations in Romania (ANOSR) also voice their discontent: “The top-rankings, however complex they might be, cannot produce more than a simplified view of universities, taken from one single perspective, as seen by those who decide on the indices that really count” [31].

4. THE DEVELOPMENT OF DISCIPLINES, SCIENTIFIC JOURNALS AND UNIVERSITIES IN UVT'S SCIENCE FACULTIES

The data presented bellows are intended to be landmarks for the development of our faculty, in accordance with the employment of the Hirsch-index as the main scientometric parameter. Table 5 shows Romania's world placement in the domains of Mathematics, Physics and Chemistry.

Table 5. Romania's world rank in Mathematics, Physics and Chemistry.

Domain	First world rank position	First world Hirsch-index	Romania's world rank	Romania's Hirsch index
Mathematics	USA	176	34	32
Physics	USA	417	38	62
Chemistry	USA	448	39	48

Table 6 illustrates the development of some disciplines in the field of Mathematics, Physics and Chemistry and the Romania's placement rank in Eastern Europe. Next we present the most outstanding academic journals in tables 7 (Mathematics), 8 (Physics) and 9 (Chemistry) together with the corresponding Hirsch indices.

The American universities' performances can be considered standards for the whole academic community in Romania. Table 10 shows the top rank in Mathematics in the year 2012 [19]. Table 11 presents the top rank in Physics during the same year [20] and table 12 illustrates the top positions in Chemistry for the same year [21].

Table 6. Disciplines development in Mathematics, Physics and Chemistry and Romania's position in Eastern Europe.

Domain	Discipline	Position	Hirsch-index
Mathematics	Analysis	4	27
	Mathematical Logic	4	10
	Applied Mathematics	4	36
	Algebra	5	18
	General Mathematics	5	32
	Modeling and Simulation	5	18
	Geometry	6	10
	Statistics	6	17
	Computer Science	7	20
	Computational Mathematics	7	18
	Physical Mathematics	8	35
	Numerical Analysis	8	14
Physics	General Physics	7	62
	Acoustics and Ultrasonics	6	10
	Condensed Matter Physics	6	48
	Non-linear and Statistical Physics	6	31
	Nuclear and High Energy Physics	7	59
	Radiation Physics	8	14
	Instrumentation	8	24
	Astronomy and Astrophysics	9	19
	Atomic, molecular and optical Physics	9	37
	Surface and interface Physics	10	27
Chemistry	Inorganic Chemistry	6	29
	Organic Chemistry	7	37
	Physical and Theoretical Chemistry	8	48
	Spectroscopy	8	29
	Analytical Chemistry	10	38
	Electrochemistry	12	28

Table 7. Academic Journals in Mathematics.

Item no.	Journal	Country	Hirsch-index
1	Applied Mathematics and Computation	Netherlands	60
2	Journal of Differential Equations	USA	54
3	American Journal of Mathematics	USA	29
4	Journal of Dynamics and Differential Equations	USA	23
5	IMA Journal of Applied Mathematics	USA	20

Table 8. Academic Journals in Physics.

Item no.	Journal	Country	Hirsch-index
1	Journal of Applied Physics	USA	187
2	Review of Modern Physics	USA	176
3	Proceedings of the IEEE	USA	139
4	Applied Optics	USA	106
5	Journal of Acoustical Society of America	USA	92

The top American universities are also provided with the best endowment as shown in the example bellow (table 13) for the year 2012 [36].

Table 9. Academic Journals in Chemistry.

Item no.	Journal	Country	Hirsch-index
1	Journal of Physical Chemistry B	USA	223
2	Analytical Chemistry	USA	199
3	Journal of Medicinal Chemistry	USA	149
4	Journal of Organic Chemistry	USA	138
5	Pure and Applied Chemistry	USA	77

Table 10. Academic Ranking of World Universities in Mathematics 2012 [19].

Item no.	University	Country	Total score
1	Princeton University	USA	100
2	Harvard University	USA	93.1
3	University of California – Berkeley	USA	88.9
4	University of Cambridge	UK	86.9
5	Stanford University	USA	80.3

Table 11. Academic Ranking of World Universities in Physics 2012 [20].

Item no.	University	Country	Total score
1	Harvard University	USA	100
2	Massachusetts Institute of Technology	USA	97.1
3	University of California – Berkeley	USA	95
4	Princeton University	UK	92.9
5	California Institute of Technology	USA	92.6

Table 12. Academic Ranking of World Universities in Chemistry 2012 [21].

Item no.	University	Country	Total score
1	Harvard University	USA	100
2	University of California – Berkeley	USA	99.3
3	Stanford University	USA	96.8
4	University of Cambridge	UK	95.7
5	Swiss Federal Institute of Technology Zurich	Switzerland	88.9

Table 13. Endowment of Top American Universities (2012) [36].

University	Endowment (\$)
Harvard University	31,728,080,000
Princeton University	17,109,628,000
Massachusetts Institute of Technology	9,712,628,000

Should we consider the big universities in the world, “Spiru Haret” University in our country could enter the top 20 [33].

Table 14 shows the number of universities in Eastern Europe [6]. USA has 2,092 universities, Japan 570, China 354, France 224, Germany 116 and Great Britain 159 [6]. In our country there are 73 universities, while another source states that their number amounts to even 100. Andrei Marga said that “universities were founded according to the law of setting up limited liability companies (SRL’s)” [23] and he also added that “Romania will not be able to cope with a system of 100 universities” [35].

The Romania’s wish to obtain a university degree is certainly a positive thing. However, given the fact that the exigencies required to obtain a diploma were not up to an appropriate level of demand, the graduation from a faculty is going to lose much of its significance [33]. Under best circumstances “the relationship between the degree acquired and the job done will not be so tight” [35]. Therefore, it becomes obvious that the Romanian educational system is facing “an inflation” of universities. In a normal situation, one

university would do for one million inhabitants [37], which mean that a number of 25-30 universities would be enough for the whole population of Romania. To this effect, Professor dr. eng. Anton Hader, the president of “Alma Mater” trade union stated that [38]: “We are a country that offers too many places in higher education compared to what we received from pre-academic education”.

Table 14. Number of universities in East-European Countries (as per 2 sources) [6, 34].

Item no.	Country	Number of universities		Item no.	Country	Number of universities	
		Source [6]	Source [34]			Source [6]	Source [34]
1	Albania	3	24	12	Macedonia	5	10
2	Armenia	5	-	13	Moldova	9	18
3	Azerbaijan	5	-	14	Montenegro	2	1
4	Bosnia and Herzegovina	10	20	15	Poland	29	132
5	Bulgaria	10	46	16	Romania	73	73
6	Croatia	5	7	17	Russia	212	398
7	The Czech Republic	28	65	18	Serbia	14	15
8	Estonia	8	14	19	Slovakia	16	32
9	Hungary	27	44	20	Slovenia	2	7
10	Latvia	15	30	21	Ukraine	51	135
11	Lithuania	16	43	22	-	-	-

Let us quote some views expressed by outstanding personalities: the English writer and art critic Herbert Read (1893-1968) stated that “Progress is measured by a degree of differentiation within a society” while the Associate Justice on the Supreme Court of the United States, Louis D. Brandeis (1856-1941) pointed out that: “America has believed that, in hierarchical differentiation, lies the path of progress”. Perhaps, as a national trait, The Romanian playwright Teodor Mazilu (1930-1980) would say that: “Ranking in respect of immorality is pointless; it is even devoid of any sense of humor. Why should villains inspire more emotion than ordinary petty things?”.

The Law of Education was modified, by an Emergency Ordinance, to eliminate the provisions which had been previously introduced, and according to which the retired professors were allowed to return to teaching and the incompatibilities regarding the rectors were ruled out, and so on. All these changes add even more disturbing effects to our education system.

However, in anticipation of the future, the increase in the quality standards of our university becomes an essential priority, also directed towards attaining a higher degree of advanced research and education.

5. CONCLUSIONS

Value ranking and differentiation was made according to obscure criteria and in an atmosphere of total disregard from the truth.

The Romanian academic community should get ready for a high-level presentation in front of the European Universities' Association (EUA) who initiated, since the beginning of 2013 an institutional evaluation of all universities in our country.

There are too many universities and too few students. The merger remains an issue which requires a thorough analysis. To this effect, prides, stratagems and other artifices must be abandoned.

The increase in the quality of the education system in order to ensure the university's higher degree of education and scientific research has become a stringent necessity.

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