

## The rankings of research funding among universities in Taiwan

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**Abstract:** With the current trend that universities around the world have gradually stepped into higher education systems of popularization, there has been more diversity in universities; hence it has become necessary to increase the transparency of university governance. Since that university classification or university ranking is a powerful mechanism to demonstrate the diversity of an institute, the rankings of research funding have become desirable and also of great value. The main purpose of this study is to analyze the rankings of research funding among universities in Taiwan, and make relevant suggestions based on the findings. A secondary data analysis was conducted on the data obtained from the database of National Science Council, in order to develop the rankings of research funding among 164 universities in Taiwan. Based on the results, the conclusions are as follows: (1) The top three universities which won the funding of the National Science Council Research Project with the best overall strength were National Taiwan University, National Cheng Gung University, and National Chiao Tung University; (2) The top three universities which won the funding of the National Science Council Research Project with the best average faculty strength were National Tsing Hua University, National Chiao Tung University, and National Taiwan University. It is suggested that, when rating the strength of a university to win the research funding, both overall strength and average faculty strength should be considered to avoid the unfairness towards universities of smaller scale.

**Key words:** research funding; research income; ranking

### 1. Research backgrounds and purposes

For centuries, universities have been playing two major roles: the role of creating knowledge and the role of disseminating knowledge. Both knowledge dissemination and knowledge creation rely on research to create endless knowledge; hence it can be said that research is right at the core of university education. With the current world-wide trend of increasing competition among universities in higher education systems, more and more people have started to care about “institutional diversity”. On the other hand, the popularization of higher education has also reflected the heterogeneity between students and courses or institutions. With the trend of higher education development, it has become increasingly important to enhance the transparency of governance in higher education institutions to understand the diversity and heterogeneity of higher education. At present, there are two methods around the world to increase the transparency of higher education. One is horizontal classification, which classifies a higher education institution on the basis of its function, assignment and characteristics to increase the understanding of the differences among the properties of higher education

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institutions. The other is vertical ranking, which ranks the same category of institution or program according to its reputation or performance to acquire rankings from different evaluations. Although current international university classifications and rankings have suffered criticisms from college faculty, the emergence of various types of classifications and ranking systems has not been influenced, and has been increased gradually instead.

Based on the above, the research purposes of this study are as follows:

- (1) To analyze the rankings of research funding among universities in Taiwan;
- (2) To propose relevant suggestions according to the research conclusions.

## **2. Literature review**

The literature reviews surveyed in this study can be divided into two parts: literature reviews about methods of research assessment and overseas literature reviews about rankings of research funding.

### **2.1 Literature reviews about methods of research assessment**

King (2004) suggested that there have been many methods for research assessment at present, such as peer review, bibliometrics and research income; however, very few are satisfactory. Peer review tends to evaluate research quality directly and it can also evaluate the connection between research and society or the connection between research funding and society and the values generated indirectly (Väyrynen, 2007). The advantage of peer review is that it can conduct overall evaluations of research activities, research performance and the economy in a research institute (Johnes & Taylor, 1990; Johnes, 1992). However, peer review cannot avoid the existence of appraiser's subjectivity. The results of peer review may be influenced by appraiser's research preference, appraiser's special emotion towards an institute under evaluation (Johnes & Taylor, 1990; Johnes, 1992) and the halo effects of the astonishing eminence of the institute in certain university. Large-scale institutes under evaluation may be in a better situation than small-scale ones for that the research achievements of them are more apparent and there are more chances that appraisers are familiar with their members (Gleave, et al., 1987).

Bibliometrics is a kind of method used to evaluate the research quality and quantity from different countries, which usually includes the quantity and citations of published research theses and review papers (King, 2004). The most tangible research output is academic publishing and apparently that the evaluation on the basis of academic publishing is more objective than peer review. When using citation popularity of theses to evaluate the research activity, the most attractive point is: It is not only objective but it also can reflect research quality (Johnes & Taylor, 1990).

Another kind of evaluation method is using the external research income of a university as a basis to evaluate research performance. Cave, Hanney, Kogan, Tomkins and Green suggested that the fund of research funding reflects the market value of that research; hence it can be viewed as a kind of index of research performance (Valadkhani & Worthington, 2005). However, Johnes and Johns (1993) indicated that the fund of funding is a kind of expenditure rather than output.

Although the three kinds of methods for research assessment mentioned above all have their own advantages and disadvantages, they are still important methods which are often used in research assessment.

### **2.2 Overseas literature reviews about rankings of research funding**

The rankings of research funding in two countries, Germany and New Zealand, are stated as follows:

- (1) Germany

Since Germany does not have a research assessment exercise like the UK does (the UK research assessment exercise), the distribution of funding from the Deutsche Forschungs gemeinschaft is competitive. One third of

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university income is from the Deutsche Forschungs gemeinschaft; hence it provides a relatively great research performance index of an institution.

**Table 1 The rankings of research funding among universities from the Deutsche Forschungs gemeinschaft**

Higher education institutions	Periods			
	1991-1995	1996-1998	1999-2001	2002-2004
Munich U <sup>a</sup>	2	1	2	1
Aachen TH <sup>b</sup>	1	2	1	2
Heidelberg U	4	4	6	3
Würzburg U	14	10	8	4
Berlin HU <sup>c</sup>	29	9	9	5
Karlsruhe TH	6	14	10	6
Erlangen-Nurember U	13	8	5	7
Tübingen U	12	6	4	8
Munich TU <sup>b</sup>	3	3	3	9
Berlin FU <sup>d</sup>	5	13	13	10
Freiburg U	10	15	11	11
Göttingen U	8	11	15	12
Bonn U	15	12	12	13
Stuttgar U	7	5	7	14
Münster U	25	23	19	15
Bochum U	11	20	17	16
Hamburg U	17	7	14	17
Cologne U	21	19	16	18
Mainz U	18	17	22	19
Frankfurt/Main U	19	25	18	20
Dresden TU	35	24	24	20
Berlin TU	9	16	20	22
Bremen U	32	31	28	23
Hannover U	16	21	21	24
Darmstadt TU	26	22	25	25
Giessen U	30	32	26	26
Marburg U	20	18	23	27
Duisburg-Essen U	-	-	-	28
Düsseldorf U	27	26	27	29
Jena U	42	35	32	30
Brunswick TU	23	28	33	31
Dortmund U	38	37	30	32
Ulm U	36	34	37	33
Constance U	28	30	29	34
Halle-Wittenberg U	44	39	38	35
Kiel U	22	27	36	36
Regensburg U	41	40	39	37
Bielefeld U	24	29	31	38
Saarbrücken U	31	33	35	39
Leipzig U	40	38	34	40

Notes: Explanations for abbreviations: <sup>a</sup> U=University, <sup>b</sup> TU/TH=University of Technology, <sup>c</sup> HU=Humboldt University, <sup>d</sup> FU=Free University. Source: DFG (2008).

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The rankings of funding from the Deutsche Forschungs gemeinschaft indicate the distribution circumstance of financial funding from the Deutsche Forschungs gemeinschaft to university institutes (as shown in Table 1 and Table 2). The existence of this research funding is indeed of rightness for that the Deutsche Forschungs gemeinschaft only sponsors research programs with best ideas and best research frames and which are able to train young scientists and researchers. To scientists and practitioners in academia, the rankings are highly competitive.

**Table 2 The amount of money sponsored by Deutsche Forschungs gemeinschaft**

Higher education institutions	The amount of money sponsored by DFG									
	Sum		Humanities and social science		Life science		Natural science		Engineering science	
	Euros (million)	Progressive percentage (%)	Euros (million)	Progressive percentage (%)	Euros (million)	Progressive percentage (%)	Euros (million)	Progressive percentage (%)	Euros (million)	Progressive percentage (%)
Munich U	130.8	4.0	26.5	5.4	77.7	6.3	23.4	2.9	3.2	0.4
Aachen TH	126.2	7.9	3.5	6.1	15.0	7.6	19.4	5.3	88.3	12.7
Heidelberg U	105.1	11.2	14.2	9.0	59.8	12.5	27.8	8.8	3.2	13.1
Würzburg U	104.7	14.4	8.2	10.7	81.6	19.1	13.4	10.5	1.5	13.3
Berlin HU	101.5	17.5	20.2	14.8	54.1	23.5	22.5	13.3	4.7	14.0
Karlsruhe TH	100.5	20.6	1.7	15.2	5.2	24.0	40.8	18.3	52.8	21.3
Erlangen-Nuremberg U	100.3	23.7	6.7	16.5	39.7	27.2	22.9	21.2	31.1	25.6
Tübingen U	99.7	26.8	24.9	21.6	52.4	31.5	17.9	23.4	4.5	26.2
Munich TU	99.3	29.9	1.7	21.9	38.7	34.6	25.2	26.6	33.7	30.8
Berlin FU	96.6	32.8	25.6	27.2	39.9	37.9	27.8	30.0	3.3	31.3
Freiburg U	91.1	35.7	12.5	29.7	55.9	42.5 17.6	17.6	32.2	5.0	32.0
Göttingen U	85.1	38.3	8.8	31.5	53.6	46.8	20.7	34.8	2.0	32.3
Bonn U	81.9	40.8	13.4	34.2	40.2	50.1	25.2	37.9	3.2	32.7
Stuttgart U	79.1	43.3	4.4	35.1	5.4	50.6	16.5	40.0	52.8	40.0
Münster U	73.5	45.5	16.8	38.6	30.8	53.1	24.7	43.1	1.2	40.1
Bochum U	73.3	47.8	10.0	40.6	21.0	54.8	20.9	45.7	21.4	43.1
Hamburg U	72.1	50.0	15.7	43.8	28.4	57.1	26.6	49.0	1.4	43.3
Cologne U	70.7	52.2	16.9	47.3	31.8	59.7	19.5	51.4	2.5	43.6
Mainz U	69.2	54.3	8.9	49.1	38.1	62.8	21.6	54.1	0.5	43.7
Frankfurt/Main U	66.5	56.4	20.2	53.2	31.9	65.4	13.3	55.7	1.0	43.8
Dresden TU	66.5	58.4	7.6	54.8	6.8	66.0	17.4	57.9	34.7	48.6
Berlin TU	63.6	60.4	4.8	55.8	5.6	66.4	23.9	60.9	29.3	52.7
Bremen U	62.2	62.3	6.6	57.1	2.0	66.6	32.1	64.9	21.5	55.7
Hannover U	60.2	64.2	1.4	57.4	5.8	67.1	17.4	67.0	35.7	60.6
Darmstadt TU	53.8	65.8	2.4	57.9	4.9	67.5	11.0	68.4	35.5	65.5
Giessen U	50.4	67.4	11.5	60.2	33.4	70.2	5.4	69.1	0	65.5
Marburg U	50.3	68.9	7.8	61.8	32.1	72.8	9.2	70.2	1.2	65.7
Duisburg-EssenU	49.7	70.5	4.8	62.8	14.8	74.0	20.6	72.8	9.5	67.0
Düsseldorf U	49.0	72.0	6.1	64.0	34.4	76.8	7.4	73.7	1.2	67.1
Jena U	46.8	73.4	13.9	66.9	16.0	78.2	13.5	75.4	3.4	67.6
Brunswick TU	45.9	74.8	1.5	67.2	7.2	78.7	4.9	76.0	32.3	72.1

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Dortmund U	45.8	76.2	3.9	68.0	0.8	78.8	9.0	77.1	32.0	76.5
Ulm U	44.5	77.6	0.5	68.1	29.8	81.2	9.2	78.3	5.0	77.2
Constance U	43.7	79.0	18.2	71.8	10.8	82.1	13.6	80.0	1.1	77.3
Halle-Wittenberg U	41.3	80.2	8.5	73.5	20.3	83.8	10.2	81.3	2.2	77.6
Kiel U	41.0	81.5	5.5	74.6	17.8	85.2	14.5	83.1	3.3	78.1
Regensburg U	40.0	82.7	5.0	75.6	22.3	87.1	12.5	84.6	0.2	78.1
Bielefeld U	40.0	84.0	16.3	79.0	9.7	87.9	9.9	85.8	4.1	78.7
Saarbrücken U	39.3	85.2	8.1	80.6	15.4	89.1	7.0	86.7	8.8	79.9
Leipzig U	38.4	86.4	9.5	82.6	13.2	90.2	12.5	88.3	3.3	80.4
The sum of top forty universities	2,799.30	86.4	404.5	82.6	1,104.80	90.2	708.7	88.3	581.4	80.4
The sum of other higher education institutions	441.8	13.6	85.5	17.4	120.2	9.8	94.2	11.7	141.9	19.6
Sum	3,241.10	100	490.00	100	1,225.00	100	802.90	100	723.30	100
The quantity of higher education institutions		154	116	74	81	106				

Source: DFG (2008).

(2) New Zealand

New Zealand has introduced the system of Performance-Based Research Fund (PBRF), which is a new policy to sponsor a university according to its research quality (as shown in Table 3 and Table 4).

**Table 3 The average amount of research funding acquired from one's own research performance and external income per teacher in academia from each university in 2007 in New Zealand**

Unit: NZD

Universities	The composing elements of the research funding from one's own research performance		External research income	
	Sum (\$)	Average amount of money per teacher (\$)	Sum (\$)	Average amount of money per teacher (\$)
University of Auckland	37,442,726	22,842	13,153,591	8,024
University of Otago	31,006,529	27,088	8,058,468	7,040
University of Canterbury	14,660,773	23,612	1,966,313	3,167
Lincoln University	4,323,681	20,145	2,110,841	9,835
Massey University	20,122,794	18,080	4,494,521	4,038
University of Waikato	8,840,939	17,564	1,910,509	3,795
Victoria University of Wellington	13,492,715	16,948	2,123,527	2,667
Auckland University of Technology	3,797,089	9,948	488,716	1,280
others	4,740,280	3,203	300,396	203
Sum	138,427,526	17,136	34,606,881	4,284

Source: Education Counts (2008).

Table 4 indicates the percentage of the acquired research funding from each university's own research from 2004 to 2007. The university with the highest percentage in four years is University of Auckland.

It is inferred from the relevant literature reviews mentioned above that the often used methods for research assessment are peer review, bibliometrics and research income. On the other hand, in the real examples of research funding in Germany and New Zealand, since it is competitive when determining the sponsorship of research funding and it is necessary to consider the research project and the quality of researchers, the rankings of

research funding in each university can also reflect the research performance of each university.

**Table 4 The percentage of research funding acquired from each university's own overall research performance in New Zealand from 2004 to 2007**

The name of higher education institution	Years			
	2004 (%)	2005 (%)	2006 (%)	2007 (%)
University of Auckland	28.9	30.2	31.5	30.3
University of Otago	22.5	21.3	20.5	21.1
Massey University	14.1	14.1	13.9	15.0
University of Canterbury	11.9	12.5	11.8	10.2
Victoria University of Wellington	8.7	8.4	8.4	9.0
University of Waikato	7.4	7.1	7.1	6.4
Lincoln University	3.4	3.4	3.6	3.3
Auckland University of Technology	1.8	1.7	1.9	2.3
Others	1.3	1.3	1.3	2.4

Source: Education Counts (2008).

### 3. Research method

This study performed secondary data analysis on the number of pieces of research projects from the database which passed the assessment of the National Science Council, in order to find out the rankings of research funding among universities in Taiwan.

### 4. Results analysis and discussion

The number of pieces of research projects which passed the review of National Science Council (NSC) was analyzed, including two aspects: total number of pieces and the average number of pieces per teacher.

First, as far as total number of pieces is concerned, the top thirty universities are in the following order: National Taiwan University, National Cheng Gung University, National Chiao Tung University, National Tsing Hua University, National Central University, National Chung Hsing University, National Sun Yat-sen University, National Chung Cheng University, National Taiwan Normal University, National Taiwan University of Science and Technology, National Cheng Chi University, Chang Gung University, National Yang Ming University, National Taipei University of Technology, Tamkang University, Feng Chia University, Kaohsiung Medical University, Chung Yuan Christian University, National Taiwan Ocean University, National Yunlin University of Science and Technology, Yuan Ze University, National Dong Hwa University, I-Shou University, Taipei Medical University, National Formosa University, Tunghai University, Southern Taiwan University of Technology, Fu Jen Catholic University, National Changhua University of Education, and National Chiayi University, as shown in Table 5.

Next, as for the average number of pieces per teacher is concerned, the top thirty universities with the largest average number of pieces per teacher from 2003 to 2007 are: National Tsing Hua University, National Chiao Tung University, National Taiwan University, National Cheng Gung University, National Central University, National Taiwan University of Science and Technology, National Sun Yat-sen University, National Chung Cheng University, National Yang Ming University, Yuan Ze University, National Chung Hsing University, National Dong

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Hwa University, National Yunlin University of Science and Technology, National Taiwan Ocean University, National Taipei University of Technology, National University of Kaohsiung, National Chi Nan University, Chang Gung University, National Kaohsiung First University of Science and Technology, National Formosa University, National Taiwan Normal University, Kaohsiung Medical University, Chung Yuan Christian University, Taipei Medical University, National Cheng Chi University, Tatung University, National Changhua University of Education, Hua Fan University and Feng Chia University, I-Shou University as shown in Table 6.

**Table 5 The passing number of pieces of NSC Research Project in each university and its ranking from 2003 to 2007**

Institution name	2003	2004	2005	2006	2007	Total number of pieces	Ranking
National Taiwan University	1780	1829	1873	1938	1605	9025	1
National Cheng Gung University	1066	1073	1085	1156	918	5298	2
National Chiao Tung University	608	670	675	704	565	3222	3
National Tsing Hua University	590	634	660	704	547	3135	4
National Central University	469	495	481	519	439	2403	5
National Chung Hsing University	429	457	457	478	365	2186	6
National Sun Yat-sen University	396	396	378	378	303	1851	7
National Chung Cheng University	379	369	379	385	321	1833	8
National Taiwan Normal University	366	368	342	379	315	1770	9
National Taiwan University of Science and Technology	306	307	294	313	260	1480	10
National Cheng Chi University	265	280	294	290	237	1366	11
Chang Gung University	257	271	269	286	223	1306	12
National Yang Ming University	234	241	250	274	220	1219	13
National Taipei University of Technology	231	237	239	245	258	1210	14
Tamkang University	245	255	241	227	197	1165	15
Feng Chia University	231	240	235	233	202	1141	16
Kaohsiung Medical University	203	217	229	242	199	1090	17
Chung Yuan Christian University	216	215	223	231	185	1070	18
National Taiwan Ocean University	193	207	230	217	187	1034	19
National Yunlin University of Science and Technology	195	199	194	198	171	957	20
Yuan Ze University	184	185	166	203	151	889	21
National Dong Hwa University	158	169	183	173	170	853	22
I-Shou University	163	187	179	177	144	850	23
Taipei Medical University	159	183	183	163	125	813	24
National Formosa University	149	157	174	168	160	808	25
Tunghai University	149	169	172	175	141	806	26
Southern Taiwan University of Technology	144	175	160	159	146	784	27
Fu Jen Catholic University	153	159	147	137	115	711	28
National Changhua University of Education	112	129	153	146	137	677	29
National Chiayi University	110	114	139	140	127	630	30
Chung Shan Medical University	98	137	129	139	116	619	31
China Medical University	99	125	112	146	126	608	32
National Pingtung University of Science and Technology	122	131	119	116	109	597	33
National Chi Nan University	123	122	119	120	107	591	34

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Da Yeh University	135	132	127	113	79	586	35
National Kaohsiung University of Applied Sciences	102	115	129	117	99	562	36
Chinese Culture University	117	109	102	93	106	527	37
Chaoyang University of Technology	106	105	105	101	108	525	38
National Kaohsiung First University of Science and Technology	87	105	104	116	108	520	39
Chung Hua University	106	108	107	98	91	510	40
Kun Shan University	80	115	102	101	84	482	41
National University of Kaohsiung	68	92	94	105	101	460	42
Soochow University	94	96	85	101	80	456	43
Chin Yun University	81	110	92	86	74	443	44
Providence University	65	83	97	100	74	419	45
National Taipei University	68	75	82	92	95	412	46
National United University	72	71	92	85	63	383	47
National Kaohsiung Normal University	66	73	74	85	85	383	47
Tatung University	76	76	71	78	72	373	49
Ming Chuan University	60	69	78	88	76	371	50
Chia Nan University of Pharmacy and Science	70	59	76	79	80	364	51
Vanung University	80	72	69	64	58	343	52
Far East University	33	68	87	84	63	335	53
Cheng Shiu University	62	66	71	67	63	329	54
Tzu Chi University	44	69	58	76	56	303	55
National Taipei University of Education	55	54	61	66	60	296	56
Fooyin University	62	75	60	57	34	288	57
National University of Tainan	44	51	55	68	63	281	58
National Chin-Yi University of Technology	53	57	54	57	60	281	58
Shih Hsin University	51	47	45	59	65	267	60
Hungkuang University	45	48	59	53	50	255	61
Minghsin University of Science and Technology	55	42	56	55	46	254	62
National Ilan University	44	41	52	51	60	248	63
Yuanpei University	41	41	55	55	55	247	64
Hua Fan University	52	58	48	52	37	247	64
Chang Jung University	45	54	56	43	47	245	66
Lunghwa University of Science and Technology	51	42	52	50	38	233	67
Central Taiwan University of Science and Technology	29	45	59	48	44	225	68
Shu Te University	39	50	48	50	35	222	69
National Pingtung University of Education	44	43	43	50	42	222	69
Chienkuo Technology University	39	44	43	46	45	217	71
National Hsinchu University of Education	43	40	44	42	39	208	72
Kao Yuan University	34	49	44	45	35	207	73
Nanhua University	29	33	40	51	52	205	74
National Kaohsiung Marine University	38	45	37	42	41	203	75
Mingchi University of Technology	49	28	37	46	39	199	76
Asia University	21	33	41	49	47	191	77

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National Hualien University of Education	36	43	50	36	21	186	78
National Taichung Institute of Technology	31	32	39	37	38	177	80
Nanya Institute of Technology	32	39	43	30	28	172	81
National Taichung University	22	33	42	38	36	171	82
China Institute of Technology	37	41	35	31	23	167	83
St. John's University	25	35	42	35	28	165	84
Taipei Municipal University of Education	41	37	30	27	27	162	85
Hsiuping Institute of Technology	29	28	30	29	31	147	86
Nan Kai Institute of Technology	21	29	28	37	32	147	86
Mingdao University	20	21	30	37	38	146	88
Wufeng Institute of Technology	23	29	30	36	24	142	89
Tungnan University	30	29	26	30	19	134	90
Leader University	27	24	27	29	19	126	91
Ta Hua College of Technology and Commerce	30	31	26	24	12	123	92
National Pingtung Institute of Commerce	26	21	20	26	29	122	93
Aletheia University	14	20	28	34	22	118	94
National Taipei College of Nursing	22	25	24	23	23	117	95
Chung Hwa University of Medical Technology	15	23	28	30	21	117	95
Tajen University	24	24	24	26	18	116	97
De Lin Institute of Technology	20	28	26	22	19	115	98
Ling Tung University	18	22	24	20	24	108	99
Technology and Science Institute of Northern Taiwan	19	23	24	26	15	107	100
Shih Chien University	10	17	22	34	23	106	101
Oriental Institute of Technology	26	23	17	24	13	103	102
Diwan University	14	21	23	22	21	101	103
China University of Technology	17	21	23	16	21	98	104
ChungChou Institute of Technology	19	20	22	16	20	97	105
Jinwen University of Science and Technology	19	25	23	16	12	95	106
Overseas Chinese Institute of Technology	12	15	19	25	20	91	107
National Penghu University	14	17	19	16	16	82	108
Kainan University	5	13	19	20	23	80	109
Chang Gung Institute of Technology	17	20	14	14	15	80	109
Yung Ta Institute of Technology & Commerce	17	16	14	17	14	78	111
Hsuan Chuang University	14	18	12	18	15	77	112
Fo Guang University	15	18	16	7	19	75	113
National Taipei College of Business	10	15	16	15	16	72	114
Mei Ho Institute of Technology	14	10	12	20	16	72	114
Taipei Physical Education College	15	16	15	17	7	70	116
National Taiwan University of Arts	11	15	17	11	12	66	117
Yu Da College of Business	8	12	18	16	12	66	117
Takming University of Science and Technology	5	13	11	15	21	65	119
National College of Physical Education and Sports	14	17	10	15	8	64	120
Nan Jeon Institute of Technology	11	13	18	12	9	63	121
Tainan University of Technology	13	13	12	12	11	61	122

(to be continued)

**The rankings of research funding among universities in Taiwan**

Fortune Institute of Technology	10	15	14	12	10	61	122
National Kaohsiung Hospitality College	9	10	11	15	13	58	124
Hsing Kuo University of Management	6	11	15	8	16	56	125
Taipei National University of the Arts	12	13	9	9	9	52	126
Chin Min Institute of Technology	18	10	10	5	7	50	127
Wenzao Ursuline College of Languages	5	3	11	14	14	47	128
Tung Fang Institute of Technology	8	10	13	12	4	47	128
Lan Yang Institute of Technology	16	13	10	5	2	46	130
Hsing Wu College	10	7	10	11	7	45	131
Transworld Institute of Technology	10	9	10	5	5	39	132
Toko University	6	11	8	5	8	38	133
Lee-Ming Institute of Technology	7	8	6	8	9	38	133
Chihlee Institute of Technology	5	8	6	8	9	36	135
Dahan Institute of Technology	6	8	4	5	8	31	136
Hwa Hsia Institute of Technology	0	0	13	9	8	30	137
Tzu Chi College of Technology	8	6	5	4	5	28	138
National Taiwan College of Physical Education	5	5	7	5	4	26	139
Ching Kuo Institute of Management and Health	5	6	5	5	2	23	140
National Kinmen Institute of Technology	2	2	4	3	9	20	141
Tainan National University of the Arts	3	2	5	5	3	18	142
Chungyu Institute of Technology	0	2	3	2	3	10	143
Tatung Institute Of Technology	1	2	1	3	2	9	144
Kao Fong Institute of Technology	0	1	2	1	2	6	145
Taipei College of Maritime Technology	0	0	0	0	3	3	146
Dharma Drum Buddhist College	-	-	-	1	2	3	146
National Taiwan College of Performing Arts	0	0	0	0	0	0	148
National Taichung Nursing College	0	0	0	0	0	0	148
National Tainan Institute of Nursing	0	0	0	0	0	0	148
Kang Ning Junior College of Medical Care and Management	0	0	0	0	0	0	148
Mackay Medicine, Nursing and Management College	0	0	0	0	0	0	148
Jen-Teh Junior College of Medicine, Nursing and Management	0	0	0	0	0	0	148
Shu-Zen College of Medicine and Management	0	0	0	0	0	0	148
Tzu Hui Institute of Technology	0	0	0	0	0	0	148
Cardinal Tien College of Nursing	0	0	0	0	0	0	148
Min-Hwei College of Health Care Management	0	0	0	0	0	0	148
Kao-Mei Institute of Technology	0	0	0	0	0	0	148
Yuh-Ing Junior College of Health Care & Management	0	0	0	0	0	0	148
Chung Jen College of Nursing, Health Science and Management	0	0	0	0	0	0	148
Kang Ning Junior College of Medical Care and Management	0	0	0	0	0	0	148
St. Mary's Medicine Nursing and Management College	-	-	0	0	0	0	148
Hsin Sheng College of Medical Care and Management	-	-	0	0	0	0	148
National Taitung Junior College	-	-	0	0	0	0	148

The rankings of research funding among universities in Taiwan

**Table 6 The average passing number of pieces of NSC Research Project per full-time teacher in each university and the ranking of it from 2003 to 2007**

Institution name	2003	2004	2005	2006	2007	The sum of average number of pieces per teacher per year	Rankings
National Tsing Hua University	1.0946	1.1719	1.162	1.2075	0.9132	1.1098	1
National Chiao Tung University	1.0799	1.1512	1.070	1.1052	0.8574	1.0527	2
National Taiwan University	0.9978	1.0139	1.025	1.0325	0.8394	0.9818	3
National Cheng Gung University	0.9647	0.9746	0.978	0.9863	0.7637	0.9335	4
National Central University	0.9361	0.9519	0.891	0.9170	0.7661	0.8924	5
National Taiwan University of Science and Technology	0.9444	0.9360	0.878	0.9125	0.7027	0.8746	6
National Sun Yat-sen University	0.8534	0.8646	0.825	0.8235	0.6544	0.8042	7
National Chung Cheng University	0.8939	0.8274	0.822	0.8105	0.6578	0.8023	8
National Yang Ming University	0.7748	0.7850	0.794	0.7611	0.6145	0.7458	9
Yuan Ze University	0.7764	0.6955	0.636	0.7382	0.5317	0.6756	10
National Chung Hsing University	0.6190	0.6410	0.624	0.6382	0.4893	0.6022	11
National Dong Hwa University	0.6100	0.6036	0.629	0.5825	0.5537	0.5957	12
National Yunlin University of Science and Technology	0.6393	0.6278	0.588	0.6055	0.5104	0.5942	13
National Taiwan Ocean University	0.5594	0.5914	0.643	0.5945	0.5095	0.5795	14
National Taipei University of Technology	0.5607	0.5866	0.568	0.5806	0.5972	0.5786	15
National University of Kaohsiung	0.5271	0.5576	0.556	0.6140	0.5233	0.5556	16
National Chi Nan University	0.6029	0.5865	0.539	0.5333	0.4652	0.5453	17
Chang Gung University	0.5377	0.5508	0.514	0.5287	0.4040	0.5071	18
National Kaohsiung First University of Science and Technology	0.4888	0.5198	0.500	0.5321	0.4615	0.5004	19
National Formosa University	0.4642	0.4673	0.516	0.5015	0.4748	0.4848	20
National Taiwan Normal University	0.5014	0.5097	0.473	0.4791	0.3818	0.4690	21
Kaohsiung Medical University	0.4645	0.4887	0.485	0.5042	0.4012	0.4688	22
Chung Yuan Christian University	0.4832	0.4736	0.499	0.4936	0.3895	0.4678	23
Taipei Medical University	0.4454	0.4973	0.504	0.4441	0.3010	0.4384	24
National Cheng Chi University	0.4180	0.4389	0.448	0.4421	0.3596	0.4214	25
Tatung University	0.3800	0.3838	0.368	0.3959	0.3478	0.3751	26
National Changhua University of Education	0.3457	0.3613	0.411	0.3946	0.3540	0.3734	27
Hua Fan University	0.4094	0.4567	0.364	0.3741	0.2587	0.3725	28
Feng Chia University	0.3869	0.3928	0.371	0.3722	0.3171	0.3680	29
I-Shou University	0.4045	0.4065	0.369	0.3417	0.2637	0.3571	30
Chung Hua University	0.3475	0.3789	0.389	0.3345	0.2993	0.3499	31
National Pingtung University of Science and Technology	0.3547	0.3830	0.347	0.3333	0.3097	0.3455	32
National Kaohsiung University of Applied Sciences	0.2991	0.3353	0.370	0.3462	0.2912	0.3283	33
Chung Shan Medical University	0.2952	0.3848	0.336	0.3357	0.2673	0.3238	34
Tunghai University	0.3047	0.3428	0.343	0.3418	0.2738	0.3211	35
Da Yeh University	0.3619	0.3438	0.326	0.3104	0.2238	0.3131	36
Tamkang University	0.3228	0.3290	0.317	0.3007	0.2662	0.3071	37
China Medical University	0.3103	0.3230	0.283	0.3403	0.2675	0.3048	38
National Taipei University of Education	0.2850	0.2700	0.298	0.3204	0.2830	0.2912	39
National Kaohsiung Normal University	0.2548	0.2852	0.281	0.3102	0.3114	0.2886	40

(to be continued)

**The rankings of research funding among universities in Taiwan**

National United University	0.2880	0.2795	0.342	0.3047	0.2195	0.2867	41
National University of Tainan	0.2340	0.2589	0.281	0.3301	0.2903	0.2788	42
Chaoyang University of Technology	0.2944	0.2846	0.282	0.2590	0.2727	0.2786	43
Southern Taiwan University of Technology	0.2662	0.3059	0.263	0.2602	0.2359	0.2663	44
National Taipei University	0.2337	0.2435	0.268	0.2848	0.2987	0.2657	45
National Chiayi University	0.2321	0.2385	0.280	0.2800	0.2566	0.2575	46
Chin Yun University	0.2664	0.3152	0.253	0.2318	0.2033	0.2539	47
Mingchi University of Technology	0.3333	0.1739	0.231	0.2805	0.2321	0.2502	48
Tzu Chi University	0.2200	0.3151	0.239	0.2794	0.1867	0.2480	49
National Hsinchu University of Education	0.2544	0.2312	0.254	0.2471	0.2267	0.2427	50
Providence University	0.1964	0.2448	0.270	0.2778	0.2005	0.2379	51
Vanung University	0.2614	0.2293	0.236	0.2169	0.2292	0.2345	52
Nanhua University	0.2014	0.2012	0.231	0.2642	0.2680	0.2332	53
National Ilan University	0.2095	0.1889	0.236	0.2350	0.2643	0.2268	54
National Pingtung University of Education	0.2222	0.2228	0.219	0.2538	0.2069	0.2250	55
Kun Shan University	0.1918	0.2656	0.224	0.2167	0.1822	0.2161	56
National Chin-Yi University of Technology	0.2112	0.2235	0.206	0.2167	0.2222	0.2159	57
National Taitung University	0.2424	0.2679	0.246	0.1404	0.1808	0.2154	58
Far East University	0.1100	0.2000	0.274	0.2642	0.2136	0.2123	59
Mingdao University	0.2198	0.1842	0.219	0.2202	0.1727	0.2032	60
Soochow University	0.2103	0.2143	0.188	0.2225	0.1762	0.2022	61
Fu Jen Catholic University	0.2224	0.2233	0.205	0.1869	0.1513	0.1978	62
National Taichung University	0.1287	0.1864	0.244	0.2147	0.2057	0.1959	63
National Hualien University of Education	0.1856	0.2228	0.262	0.1885	0.1082	0.1934	64
Yuanpei University	0.1602	0.1547	0.208	0.2091	0.2068	0.1878	65
National Kaohsiung Marine University	0.1881	0.2143	0.169	0.1810	0.1767	0.1858	66
Lunghwa University of Science and Technology	0.2125	0.1694	0.200	0.1946	0.1479	0.1849	67
Shih Hsin University	0.1828	0.1661	0.156	0.1897	0.1994	0.1787	68
Asia University	0.1567	0.1774	0.190	0.2059	0.1531	0.1766	69
Shu Te University	0.1757	0.2024	0.178	0.1866	0.1259	0.1738	70
National Pingtung Institute of Commerce	0.1857	0.1533	0.153	0.1745	0.1859	0.1704	71
National Penghu University	0.1647	0.1789	0.196	0.1584	0.1538	0.1703	72
Hungkuang University	0.1429	0.1543	0.188	0.1667	0.1543	0.1612	73
Fo Guang University	0.1705	0.1935	0.182	0.0778	0.1810	0.1609	74
National Taipei College of Nursing	0.1497	0.1701	0.166	0.1586	0.1597	0.1607	75
Taipei Municipal University of Education	0.2040	0.1850	0.148	0.1324	0.1317	0.1602	76
Chang Jung University	0.1642	0.1770	0.175	0.1335	0.1460	0.1590	77
Chia Nan University of Pharmacy and Science	0.1759	0.1369	0.163	0.1580	0.1603	0.1588	78
Leader University	0.1901	0.1437	0.203	0.1568	0.0984	0.1585	79
Cheng Shiu University	0.1490	0.1583	0.170	0.1573	0.1489	0.1567	80
Chinese Culture University	0.1828	0.1685	0.151	0.1306	0.1427	0.1552	81
Nanya Institute of Technology	0.1517	0.1696	0.181	0.1345	0.1094	0.1492	82
National College of Physical Education and Sports	0.1728	0.2024	0.116	0.1613	0.0842	0.1474	83

(to be continued)

**The rankings of research funding among universities in Taiwan**

Fooyin University	0.1538	0.2072	0.126	0.1253	0.0762	0.1377	84
Dharma Drum Buddhist College	-	-	-	0.0909	0.1818	0.1364	85
Central Taiwan University of Science and Technology	0.0951	0.1393	0.172	0.1437	0.1294	0.1359	86
Oriental Institute of Technology	0.1667	0.1503	0.115	0.1558	0.0788	0.1333	87
Ming Chuan University	0.1134	0.1290	0.138	0.1467	0.1236	0.1302	88
Chienkuo Technology University	0.1161	0.1209	0.127	0.1394	0.1411	0.1289	89
Kao Yuan University	0.1141	0.1512	0.133	0.1360	0.1051	0.1278	90
Taipei Physical Education College	0.1515	0.1455	0.135	0.1453	0.0609	0.1277	91
St. John's University	0.0933	0.1351	0.163	0.1296	0.1061	0.1254	92
Nan Kai Institute of Technology	0.0913	0.1255	0.122	0.1516	0.1290	0.1239	93
China Institute of Technology	0.1418	0.1217	0.117	0.1084	0.0785	0.1136	94
Minghsin University of Science and Technology	0.1242	0.0935	0.121	0.1196	0.0981	0.1112	95
Hsiuping Institute of Technology	0.1062	0.0989	0.107	0.1028	0.1099	0.1050	96
Diwan University	0.0745	0.1071	0.122	0.1164	0.0977	0.1035	97
Wufeng Institute of Technology	0.0852	0.0957	0.107	0.1268	0.0906	0.1011	98
National Kaohsiung Hospitality College	0.0811	0.0840	0.094	0.1271	0.1024	0.0977	99
National Taichung Institute of Technology	0.0838	0.0870	0.108	0.1022	0.1056	0.0974	100
ChungChou Institute of Technology	0.0995	0.1000	0.114	0.0777	0.0952	0.0973	101
Hsuan Chuang University	0.1037	0.1071	0.074	0.1071	0.0802	0.0943	102
Ta Hua College of Technology and Commerce	0.1056	0.1080	0.093	0.0836	0.0446	0.0869	103
National Taiwan University of Arts	0.0738	0.0993	0.110	0.0705	0.0764	0.0859	104
De Lin Institute of Technology	0.0707	0.0982	0.095	0.0827	0.0728	0.0839	105
Tungnan University	0.0932	0.0786	0.081	0.1027	0.0629	0.0837	106
Aletheia University	0.0560	0.0749	0.097	0.1009	0.0663	0.0791	107
Taipei National University of the Arts	0.0916	0.0977	0.064	0.0643	0.0638	0.0762	108
National Taipei College of Business	0.0476	0.0794	0.086	0.0829	0.0847	0.0761	109
Toko University	0.0606	0.1158	0.093	0.0427	0.0656	0.0755	110
Kainan University	0.0439	0.0839	0.080	0.0778	0.0833	0.0738	111
Hsing Kuo University of Management	0.0469	0.0748	0.096	0.0506	0.0988	0.0735	112
National Kinmen Institute of Technology	0.0488	0.0435	0.082	0.0545	0.1324	0.0722	113
Overseas Chinese Institute of Technology	0.0494	0.0591	0.074	0.0958	0.0752	0.0707	114
Chung Hwa University of Medical Technology	0.0478	0.0723	0.082	0.0862	0.0619	0.0701	115
Yung Ta Institute of Technology and Commerce	0.0677	0.0650	0.063	0.0773	0.0648	0.0675	116
Ling Tung University	0.0520	0.0604	0.071	0.0627	0.0772	0.0646	117
Tajen University	0.0619	0.0608	0.065	0.0699	0.0468	0.0609	118
Shih Chien University	0.0360	0.0515	0.063	0.0888	0.0574	0.0593	119
Mei Ho Institute of Technology	0.0664	0.0478	0.049	0.0752	0.0557	0.0589	120
National Taiwan College of Physical Education	0.0562	0.0549	0.079	0.0568	0.0471	0.0587	121
Jinwen University of Science and Technology	0.0648	0.0648	0.073	0.0511	0.0403	0.0587	121
China University of Technology	0.0478	0.0593	0.064	0.0451	0.0574	0.0547	123
Takming University of Science and Technology	0.0221	0.0570	0.048	0.0617	0.0847	0.0546	124
Nan Jeon Institute of Technology	0.0455	0.0537	0.077	0.0536	0.0411	0.0542	125

(to be continued)

**The rankings of research funding among universities in Taiwan**

Yu Da College of Business	0.0328	0.0472	0.072	0.0643	0.0484	0.0529	126
Chang Gung Institute of Technology	0.0599	0.0714	0.049	0.0386	0.0399	0.0517	127
Technology and Science Institute of Northern Taiwan	0.0445	0.0490	0.058	0.0636	0.0398	0.0509	128
Tzu Chi College of Technology	0.0625	0.0484	0.039	0.0315	0.0424	0.0448	129
Chin Min Institute of Technology	0.0735	0.0481	0.042	0.0220	0.0338	0.0440	130
Tainan National University of the Arts	0.0441	0.0235	0.058	0.0588	0.0330	0.0434	131
Wenzao Ursuline College of Languages	0.0248	0.0150	0.052	0.0631	0.0609	0.0432	132
Fortune Institute of Technology	0.0330	0.0464	0.049	0.0444	0.0418	0.0430	133
Ching Kuo Institute of Management and Health	0.0442	0.0508	0.043	0.0442	0.0182	0.0401	134
Tung Fang Institute of Technology	0.0381	0.0386	0.053	0.0490	0.0167	0.0391	135
Transworld Institute of Technology	0.0442	0.0417	0.050	0.0249	0.0240	0.0369	136
Lan Yang Institute of Technology	0.0590	0.0463	0.041	0.0213	0.0087	0.0352	137
Lee-Ming Institute of Technology	0.0308	0.0348	0.026	0.0359	0.0431	0.0342	138
Southern Taiwan University	0.0339	0.0349	0.034	0.0347	0.0314	0.0339	139
Dahan Institute of Technology	0.0297	0.0392	0.021	0.0267	0.0460	0.0324	140
Hwa Hsia Institute of Technology	0.0000	0.0000	0.066	0.0486	0.0449	0.0320	141
Hsing Wu College	0.0346	0.0220	0.034	0.0375	0.0256	0.0307	142
Chihlee Institute of Technology	0.0272	0.0340	0.025	0.0315	0.0362	0.0307	142
Kao Fong Institute of Technology	-	0.0294	0.043	0.0147	0.0286	0.0288	144
Chungyu Institute of Technology	0.0000	0.0107	0.021	0.0165	0.0259	0.0148	145
Tatung Institute Of Technology	0.0074	0.0133	0.008	0.0256	0.0182	0.0145	146
Taiwan Hospitality and Tourism College	0.0000	0.0000	0.000	0.0313	0.0147	0.0092	147
Taipei College of Maritime Technology	0.0000	0.0000	0.000	0.0000	0.0259	0.0052	148
National Taiwan College of Performing Arts	0.0000	0.0000	0.000	0.0000	0.0000	0.0000	149
National Taichung Nursing College	0.0000	0.0000	0.000	0.0000	0.0000	0.0000	149
National Tainan Institute of Nursing	0.0000	0.0000	0.000	0.0000	0.0000	0.0000	149
National Taitung Junior College	-	-	-	0.0000	0.0000	0.0000	149
Kang Ning Junior College of Medical Care and Management	0.0000	0.0000	0.000	0.0000	0.0000	0.0000	149
Mackay Medicine, Nursing and Management College	0.0000	0.0000	0.000	0.0000	0.0000	0.0000	149
Jen-Teh Junior College of Medicine, Nursing and Management	0.0000	0.0000	0.000	0.0000	0.0000	0.0000	149
Shu-Zen College of Medicine and Management	0.0000	0.0000	0.000	0.0000	0.0000	0.0000	149
Tzu Hui Institute of Technology	0.0000	0.0000	0.000	0.0000	0.0000	0.0000	149
Cardinal Tien College of Healthcare and Management	0.0000	0.0000	0.000	0.0000	0.0000	0.0000	149
Min-Hwei College of Health Care Management	0.0000	0.0000	0.000	0.0000	0.0000	0.0000	149
Kao-Mei Institute of Technology	0.0000	0.0000	0.000	0.0000	0.0000	0.0000	149
Yuh-Ing Junior College of Health Care and Management	0.0000	0.0000	0.000	0.0000	0.0000	0.0000	149
Chung Jen College of Nursing, Health Science and Management	-	-	0.000	0.0000	0.0000	0.0000	149
St. Mary's Medicine Nursing and Management College	-	-	0.000	0.0000	0.0000	0.0000	149
Hsin Sheng College of Medical Care and Management	-	-	0.000	0.0000	0.0000	0.0000	149

The rankings of this result are different from the former rankings because the former rankings reflect the

overall strength of each university to win the funding of NSC Research Project while the later rankings reflect the average faculty strength of each university to win the funding of NSC Research Project.

## 5. Conclusions and suggestions

Based on the above results, conclusions and suggestions are made as follows:

### 5.1 Conclusions

The top three universities with the best overall strength to win the researching funding of NSC Research Project are National Taiwan University, National Cheng Gung University and National Chiao Tung University. The results suggest that the first place is National Taiwan University, the second place is National Cheng Gung University, and the third place is National Chiao Tung University.

The top three universities with the best average faculty strength to win the research funding of NSC Research Project are National Tsing Hua University, National Chiao Tung University and National Taiwan University. The results suggest that the first place is National Tsing Hua University, the second place is National Chiao Tung University, and the third place is National Taiwan University. Comparing this conclusion with the first conclusion, it can be found that both National Taiwan University and National Cheng Gung University acquire advantages with their large-scale.

**Table 7 The 24 underlined universities of top thirty in both two lists**

Institution name	The rankings of total number of pieces	Institution name	The rankings of average number of pieces per teacher
National Taiwan University	1	National Tsing Hua University	1
National Cheng Gung University	2	National Chiao Tung University	2
National Chiao Tung University	3	National Taiwan University	3
National Tsing Hua University	4	National Cheng Gung University	4
National Central University	5	National Central University	5
National Chung Hsing University	6	National Taiwan University of Science and Technology	6
National Sun Yat-sen University	7	National Chung Cheng University	7
National Chung Cheng University	8	National Sun Yat-sen University	8
National Taiwan Normal University	9	National Yang Ming University	9
National Taiwan University of Science and Technology	10	Yuan Ze University	10
National Cheng Chi University	11	National Chung Hsing University	11
Chang Gung University	12	National Yunlin University of Science and Technology	12
National Yang Ming University	13	National Dong Hwa University	13
National Taipei University of Technology	14	National Taiwan Ocean University	14
Tamkang University	15	National Taipei University of Technology	15
Feng Chia University	16	National University of Kaohsiung	16
Kaohsiung Medical University	17	National Chi Nan University	17
Chung Yuan Christian University	18	Chang Gung University	18
National Taiwan Ocean University	19	National Kaohsiung First University of Science and Technology	19
National Yunlin University of Science and Technology	20	National Formosa University	20

(to be continued)

**The rankings of research funding among universities in Taiwan**

Yuan Ze University	21	Kaohsiung Medical University	21
I-Shou University	22	Chung Yuan Christian University	22
National Dong Hwa University	23	National Taiwan Normal University	23
Taipei Medical University	24	Taipei Medical University	24
National Formosa University	25	National Cheng Chi University	25
Tunghai University	26	Shu Te University	26
Southern Taiwan University of Technology	27	National Changhua University of Education	27
Fu Jen Catholic University	28	Tatung University	28
National Changhua University of Education	29	Hua Fan University	29
National Chiayi University	30	Feng Chia University	30

**Table 8 The rankings which consider both total number of pieces and average number of pieces per teacher**

Institution name	The sum of two rankings	Average rankings
National Taiwan University	4	1
National Chiao Tung University	5	2
National Tsing Hua University	5	2
National Cheng Gung University	6	4
National Central University	10	5
National Sun Yat-sen University	15	6
National Chung Cheng University	15	6
National Taiwan University of Science and Technology	16	8
National Chung Hsing University	17	9
National Yang Ming University	22	10
National Taipei University of Technology	29	11
Chang Gung University	30	12
Yuan Ze University	31	13
National Taiwan Normal University	32	14
National Yunlin University of Science and Technology	32	14
National Taiwan Ocean University	33	16
National Cheng Chi University	36	17
National Dong Hwa University	36	17
Kaohsiung Medical University	38	19
Chung Yuan Christian University	40	20
National Formosa University	45	21
Feng Chia University	46	22
Taipei Medical University	48	23
National Changhua University of Education	56	24

## 5.2 Suggestions

According to the research results and conclusions, it is suggested that when evaluating the strength of a university to win research funding, both overall strength and average faculty strength should be considered to avoid the unfairness towards universities of smaller scale. In fact, when evaluating the research performance of each university in Taiwan, it should be considered that how to avoid the absolute advantage caused from different scales. Taking this study as an example, if both overall strength and average faculty strength are considered at the same time, the universities of top thirty (indicated by underline) in both two lists are selected and 24 institutions



correspond to this request, as shown in Table 7. The average rankings which consider both total number of pieces and average number of pieces per teacher are shown in Table 8.

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(Edited by Nicole and Lily)