Quality Assurance and Excellence in Taiwan Higher Education-An Analysis of Three Taiwan Major College Rankings

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Quality Assurance and Excellence in Taiwan Higher Education -- An Analysis of Three Taiwan Major College Rankings

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Abstract

The trend of globalization in higher education has led to increasingly intense and international competition between universities. Hence, universities and colleges are no longer satisfied with just achieving a high reputation in national rankings, but rather are now actively competing for the best academic status in global rankings as a validation of their performances over other institutions. Besides, outstanding students also hope to choose a world-class university based on more transparent information. Seemingly, global college rankings have drawn international attention worldwide, including many interested academics, students and politicians in Taiwan. Nowadays, a variety of agencies in Taiwan, including the mass media, universities, government agencies, are involved in the development of rankings.

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Under the "University Law" revised in 2005, all Taiwan universities and colleges are obligated for assessments regularly with regard to standards and procedures by accrediting agencies chartered by the Ministry of Education. On the other hand, as the result of being pressured by severe international competition, however, rankings began to receive more attention than accreditation. By 2008 several rankings had been developed in Taiwan. The main purpose of the paper is to explore type, methodology and future developments of three major college ranking in Taiwan, including "Academic Ranking of Universities in Taiwan" by Tamkang University, "Performance Ranking of Scientific Papers for World Universities" and "College Navigator in Taiwan" by Higher Education Evaluation & Accreditation Council of Taiwan, and their impact on Taiwan higher education.

Keyword: Quality Assurance; Ranking; Higher Education

1. Introduction

Globalization has been affecting politics, economic systems, national identity and the independence of nation states. Moreover, it has changed the education agenda of states as well, including teaching and learning, and the ability of a learner to deal with social and cultural differences. It is reshaping the core value of higher education institutions through market influences and symbolic concerns about cultural identity (Ginkel, 2003).

Globalization, therefore, presents universities and states with a number of challenges and opportunities. Currently, the major concern for both of them is how to assure quality in higher education and global competitiveness through a variety of policies and actions. Hence, quality assurance mechanisms and international benchmarking, which emphasize output monitoring and measurements and systems of accountability and auditing, have become more popular worldwide (Marginson, 2007). In this context, the pursuit of an international image and academic excellence makes the selected top institutions more globally competitive (Deem et al., 2008).This also rationalizes the emergence of international ranking and accreditation, which is taken as a symbolic and powerful indicator to prove the quality standard of local institutions in the globally competitive education market (Ewell, 2008).

Compared to accreditation, academic rankings and league tables that create data transparency are regarded as a more powerful tool and instrument to evaluation of quality in higher education institution (Muller-Boling & Federkeil, 2007). Indeed, "rankings are inevitable in the era of massification," because "those who finance higher education and the public want to know which academic institutions are the best" (Altbach, 2006). According to Sadlak (2006), former Director of UNESCO-European Centre for Higher Education, "ranking, which can be defined as an established approach, with corresponding methodology and procedures, for displaying the comparative standing of whole institutions or certain domains of its performance, is now fast becoming a world wide phenomenon" (p. 3). Frankly speaking, there are several reasons for rankings to stay, such as providing the general public with information, fostering healthy competition among higher education institutions, stimulating the evolution of centers of excellence, and offering additional rationale for

allocation of state funds (Sadlak, 2006). It is now also an accepted component of an external tool for "quality assurance."

The trend of globalization in higher education has led to increasingly intense and international competition between universities. Hence, universities and colleges are no longer satisfied with a top reputation in their national rankings, but rather they are now competing for the highest academic status in the global university rankings as proof of their relative performance over other institutions. Besides, outstanding students also hope to choose a world-class university based on more transparent information. Seemingly, global college rankings have drawn international attention worldwide, including Taiwan. Nowadays, a variety of agencies in Taiwan, including mass media, universities, government agencies, are involved in the development of rankings.

Under the "University Law" revised in 2005, all Taiwan universities and colleges are obligated for assessments regularly with regard to standards and procedures by accrediting agencies chartered by the Ministry of Education. On the other hand, being pressured by severe international competition, however, rankings began to receive more attention than accreditation. Up until 2008, several rankings in Taiwan have been developed. The main purpose of the paper is to explore the type, the methodology and the future developments of the three major college rankings in Taiwan, including "Academic Ranking of Universities in Taiwan" by Tamkang University, "Performance Ranking of Scientific Papers for World Universities" and "College Navigator in Taiwan" by Higher Education Evaluation & Accreditation Council of Taiwan, and their impact on Taiwan higher education. First, quality assurance in higher education system of Taiwan will be introduced. The three major Taiwan rankings will be analyzed next. The impact of ranking outcomes will be stated as a conclusion.

2. Quality Assurance and Excellence in Taiwan Higher Education

Over the past 10 years, Taiwan higher education has expanded impressively with the increases in the number of institutions as well as the number of students. Amid flourishing economic development, social liberalization, and democratization in the 1990s, Taiwan higher education has been led to a more decentralized manner with less state control. As a result, universities have begun

to seek their autonomy from the state. By 2008, the number of higher education institutions had gone up to 163 largely due to the upgrade of junior colleges to 4-year comprehensive universities. Student enrollment increased 65% with a total number of 1.3 millions. The University Entrance Exam admission rate is close to 97%. Net Enrollment and gross enrollment in higher education are approximately 55.3% (693,847/1,254,395) and 78.6% (987,914/1,254,395) (Department of Higher Education, 2008). As higher education has expanded rapidly in quantitative terms, thus, the greatest challenge that Taiwan higher education now faces is how to assure its quality and international competitiveness in the globalized society.

2.1 Setting up Quality Assurance System

The concept of quality assurance had been spreading through Taiwan higher education system since the 1980s. Apart from encouraging institutions to conduct assessments on their own, a few professional associations such as Chinese Management Association, Chemical Society, and the Physical Association of Republic of China were commissioned by the Ministry of Education to exercise program-based academic assessments. Moving to the 1990s, the government was pressured continuously by the Taiwanese public to implement wide-ranging comprehensive institutional evaluations and was determined to establish a non-governmental professional evaluation agency to conduct higher education evaluation. In 2005, Legislative Yuan revised the "University law" which stated clearly that the national government is entitled to university evaluation in order to assure higher education quality. In the same year, Higher Education Evaluation & Accreditation Council of Taiwan (HEEACT) was established jointly by the Ministry of Education and 153 Taiwan universities and colleges to carry out programmatic evaluations of over 68 4-year comprehensive colleges and universities (HEEACT, 2008b).

HEEACT adopted the American model of accreditation featuring peer review and on-site visits in the process and procedures of its evaluations. In each review, over 800 reviewers from universities and industries are recommended by 47 Program Planning Committees formed by the Board to conduct evaluations (HEEACT, 2008b). The accreditation standards developed by the HEEACT are as follows:

- Goals, features, and self-enhancement mechanism;
- Curriculum design and teaching;
- Learning and student affairs;
- Research and professional performance;
- Performance of graduates.

There are three review outcomes of accreditation including "accredited," "conditionally accredited" and "failure." Those with a status of "conditionally accredited" or "failure" are supposed to be reviewed again one year later to check if all major problems mentioned in the final accreditation report have been solved during a year. Currently, four rounds of programmatic evaluation have been conducted, and the results of the first three rounds have been released.

According to the review outcomes in the past 3 years, the accredited programs in the spring semester of 2007 outnumbered the other 4 reviews. Among the total of

1,366 programs, the average rate for accredited status is 82%, conditionally accredited type with 14.62% and failure category with 2.92% (see Table 1). It shows that Taiwan institutions are getting more and more acquainted with the HEEACT evaluation model aiming at self-enhancement in teaching quality as well as learning the ways of preparations for faculty participation.

Table 1. Number and Percent of Programs Reviewed by Status

	Review status		Accredited		Accredited conditionally		Failure	
Academic Year		Number of programs	Number	%	Number	%	Number	%
2006	Fall Semester	362	279	77%	71	19.6%	11	3%
2007	Spring Semester	242	159	65.7%	55	22.7%	27	11.6%
	Fall Semester	265(458*)	386*	84.3%	65*	14.2%	7*	1.5%
2008	Spring Semester	231(418*)	376*	90%	42*	10%	0	0%
	Fall Semester	266(455*)	425	93.41%	30	6.59%	0	0
Total		1366		82%		14.62%		1.5%

Source: Higher Education Evaluation & Accreditation Council of Taiwan (2009). *2008 Annual report*. Taipei: Higher Education Evaluation & Accreditation Council of Taiwan.

* They are classes.

2.2 Internationalization and Excellence

In order to strengthen the international outlook and global competitiveness of Taiwan colleges and universities, the MOE internationalizes Taiwan's higher education by four polices. First, in 2002, the MOE launched the "Enhancing Global Competitiveness Plan" aimed at fostering international exchange activities to improve international competitiveness of institutions. Second, increasing the number of foreign students studying in Taiwan has been on the priority list of the MOE since August 2003. Higher education Institutions offer scholarships and English taught courses in both undergraduate and postgraduate programs to achieve this objective. Third, the MOE encourages Taiwan students to study abroad by launching the "Study Abroad Loan Program" in 2004. In addition, the MOE expanded the Taiwan Culture Research Program in scale with foreign academic institutes to attract attention on the academic stage globally (Department of Higher Education, 2007).

Globalization in the 21st century has led to a big change and impact in the higher education community. Technological and economical development depends highly on quality of research output of a nation, and in many ways, the academic research of higher education institutions represent the competitiveness of a nation. Thus, quality of research performance of research universities is highly related to the economic development of a nation. In response to the quest for a world-class university, Taiwan government launched the 5-year 50 Billion Program for Developing First-class University and Top Research Centers in 2005. To achieve this goal, research universities granted are required to complete a five-stage process ranging over the funding period in order to renew their projects in the following year. The 5-year 50 Billion Program can be linked with other strategies such as the wholesale restructuring of the higher education system for internationalizing Taiwan's higher education sector. More importantly, it marked Taiwan's intention to join the competition among other higher education systems in the region under the theme of building a "world-class" university. The program aims to develop at least one university as one of the world's top 100 universities in five years and at least 15 key departments or cross-university research centers as the top in Asia in ten years (Lo, 2009). 10 research universities were selected to be funded in 2007 academic year compared with 11 in the first cycle of academic year 2005-2006. (See Table 2)

Table 2. A list of Taiwan Research Universities Granted by MOE Program from 2005 to 2007 (in NT million)

Institution	2005	2006	2007	Subtotal
National Taiwan University	3,000	3,000	3,000	9,000
National Cheng Kung University	1,700	1,700	1,700	5,100
National Tsing Hwa University	1,000	1,000	1,200	3,200
National Jiao Tong University	800	800	900	2,500
National Central University	600	600	700	1,900
National Sun Yat-sen University	600	600	600	1,800
National Yang-Ming University	500	500	500	1,500
National Chung Hsing University	400	400	450	1,250
National Chengchi University	300	300	200	800
Chang Gung University	300	300	200	800
Yuan Ze University	300	300	0	600

Source: Department of Higher Education (2008). 5-year 50 Billion Program for Developing First-class University and Top Research Centers. Retrieved Jannuary 2009, from http://www.edu.tw/high/itemize.aspx?itemize_sn=3520&pages=1&site_content_sn=1234

On the other hand, without the massive funding from the government, some institutions in Taiwan started earlier in their quest for international accreditation and reputation to promote more opportunities of international academic activities with foreign universities in the early 21st century. By 2009, 4 Business schools in Taiwan Universities, including Fu Jen Catholic University, National Sun Yat Shen University, National Chiao Tung University, and National Chengchi University have gained AACSB International's accreditation (AACSB, 2009).

3. Three Major College Rankings in Taiwan after the Late 1990s

Among all college rankings currently around the world, an annual ranking of American universities published since 1983 by the renowned magazine "*U.S. News and World Report*" has been recognized as the most influential. Then, many countries began to follow its step and to publish national college rankings, such as Canada's "*Maclean's*", Britain's "*The Times*", Japan's "*Asahi Shimbun*", and German's "*The Center for Higher Education Development*."

Since entering the 21st century, the development of college rankings became internationalized. Shanghai Jiao Tong University of Mainland China published the first global ranking of universities in June 2003 -- "*Academic Ranking of World Universities*," or also known as ARWU. The ranking uses internationally recognized academic performances and achievements as the major indicators in rating 1,000 universities worldwide. Indeed, the release of this ranking caused widespread concern and discussion in the international community and the indicators have also become the main concern for national governments in the pursuit of creating world-class universities. On the other hand, the ranking by Shanghai Jiao Tong University triggered intense global academic competition throughout the world, and shortly after the release, Britain's "*The Times Higher Education Supplement*" came out with its own "*World University Rankings*" covering 200 universities in 2004. Another World ranking titled "*Webometrics Ranking of World Universities*" was published by Cybermetrics Lab, CINDOC-CSIC in Spain at the same year (Hou, 2007).

Before the 1990s, most college rankings or league tables in Taiwan published by mass media didn't draw the public attention due to validity and creditability in their methodology. Driven by the global market of higher education, universities and government agencies started to develop rankings as a tool to encourage institutions to strive for excellence. Up to present, there are 3 major types of college rankings that have been developed in Taiwan. Each has its own mission and purpose.

3.1 Tamkang National College Ranking

"2003 Academic Ranking of Universities in Taiwan" conducted by Tamkang University was the first national college ranking published by an academic institution. There are two purposes of the ranking; one was to understand the overall academic performance of Taiwan higher education institutions, and the other was used as a self-improvement for Tamkang University. In the consecutive 4 years, Engineering and Business Programs Rankings were published based on the ranking framework of U.S. News & World Report. Following the new classification of higher education institutions in 2006 of Taiwan, the Tamkang ranking group modified the categories of institutions and indicators in the old version (Tamkang University, 2008). The

2007, 2008 editions had been published and the Tamkang University ranking group is working on the 2010 edition now.

Tamkang ranking completely adopted U.S News & World Report model to develop 16 indicators and 8 criteria and classified all 140 ranked institutions into two types, Doctoral-Master Type and Baccalaureate Type based on the framework of Carnegie classification of higher education institutions (Tamkang, 2008). In Baccalaureate Type, "research output" is not used to rank this group, so the weights in all criteria assigned in Doctoral-Master Type are readjusted here. Both types include an academic survey which receives a higher weight of 25% (see Table 3 and Table 4).

Table 3. Criteria and Weighting for Doctorate-Master's Type in 2009 Tamkang National Ranking

Criteria	Weighting	Indicator
1. Reputation	25%	Academic survey
2. Student Demographics	5%	Proportion of graduate students
		Ratio of Ph.D. and Masters' candidates
3. Faculty Resources	20%	Proportion of faculty members above assistant professors
		Proportion of professors with Ph.D. degrees
		Proportion of full-time faculty
		Faculty-student ratio
4. Financial Resources	10%	Expenditure per student
5. Research Output	25%	Number of articles published in SCI / number per faculty
		Number of articles published in SSCI / number per faculty
		NSC projects per faculty
		NSC grants per faculty
6. Enrollment rate	5%	Ratio of freshmen enrolled
7. Graduation rate	5%	Average proportion of a graduate class who earns a degree in four years
8. Internationalization	5%	Proportion of international students
		Proportion of international faculty

Source: Tamkang University (2008). *2008 Academic rankings of universities in Taiwan*. Taipei: Tamkang University.

Table 4. Criteria and Weighting for Baccalaureate Type in 2009 Tamkang National Ranking

Criteria	Weighting	Indicator
1. Reputation	25%	Academic survey
2.Student Demographics	10%	Proportion of graduate students
		Ratio of Ph.D. and Masters' candidates
3. Faculty Resources	20%	Proportion of faculty members above assistant professors
		Proportion of professors with Ph.D. degrees
		Proportion of full-time faculty
		Faculty-student ratio
4. Financial Resources	15%	Expenditure per student
5. Enrollment Rate	10%	Ratio of freshmen enrolled
6. Graduation Rate	10%	Average proportion of a graduate class who earns a degree in four years
7. Internationalization	10%	Proportion of international students
		Proportion of international faculty

Source: Tamkang University (2008). *2008 Academic rankings of universities in Taiwan*. Taipei: Tamkang University.

3.2 Response Rate of Academic Survey

A total of 689 questionnaires were issued, with 482 and 207 copies for Doctorate-Master's and Baccalaureate Types. As shown, 382 questionnaires in both types were returned by 30 April, 2009. The overall rate of the returned questionnaires was 55.44%, higher than 51.10% in 2008 (Table 5).

Table 5. Rate of Returned Questionnaires in Academic Survey

Type	Issued	Returned	Response Rate%
Doctoral-master	482	265	54.98
Baccalaureate	207	117	56.52
Total	689	382	55.44

Source: Tamkang University (2009). *2009 Academic rankings of universities in Taiwan*. Taipei: Tamkang University. Tamkang University (2008). *2008 Academic rankings of universities in Taiwan.* Taipei: Tamkang University.

The indicators were then weighted at a certain ratio and the scores were aggregated to rank each college. The top one university received highest points while the scores for the remaining schools descended accordingly. According to the Tamkang ranking outcomes, top 10 Taiwan Universities from year 2003-2009 are as follows (see Table 6 and Table 7):

Table 6. Top 10 Universities from Year 2003-2009 Tamkang Ranking

Institutions	2009	2008	2007	2003
National Tsing Hwa University	1	1	1	1
National Cheng Kung University	2	2	2	4
National Taiwan University	3	3	3	3
National Jiao Tong University	4	5	4	/
National Yang-Ming University	5	4	5	2
National Central University	6	6	6	6
National Sun Yat-sen University	7	7	7	15
National University of Science and Technology	8	8	8	5
National Chung Cheng University	9	10	12	11
National Chung Hsing University	10	9	10	10

Source: Tamkang University (2008). *2008 Academic rankings of universities in Taiwan*. Taipei: Tamkang University.

Table 7. 2009 Tamkang Ranking Outcomes

Rank	National		Private		Doctoral		Master	
	No.	%	No.	%	No.	%	No.	%
1-10	10	11.4	0	0	10	11.4	0	0
11-20	7	7.9	3.4	7.8	7	7.9	3	3.4
21-40	11	11.5	9	10.22	7	7.9	13	14.7
41-60	7	7.9	13	14.8	1	1.1	19	21.6
61-88	8	9	20	22.7	1	1.1	27	30.7
Subtotal	43	48.9	45	51.1	26	29.5	62	70.5

Source: Tamkang University (2009). *2009 Academic rankings of universities in Taiwan*. Taipei: Tamkang University.

3.3 Correlation Between Scores of Indicators

On the other hand, Table 8 and Table 9 show the correlation between scores of indicators for Doctorate-Master's and Baccalaureate Type in 2008. In Doctorate-Master's Type, the correlation coefficients between the total score and the score of reputation, student selectivity, faculty resources and research out are above 0.80; by comparison, the scores of the other 3 indicators, enrollment rate, graduation rate, and internationalization don't correlate well among themselves with correlation coefficients lower than 0.50, indicating that input and process indicators are more influential factors in the ranking outcomes.

In Baccalaureate Type, correlation coefficients between total scores and the scores of the indicators are much lower than in Doctorate-Master's Type. Only the scores of three indicators, reputation, financial resources and enrollment rate correlate with total scores better. It indicates that the new indicators for the group should be developed in the future. However, financial resource is the leading factor in ranking outcomes of Baccalaureate Type.

Table 8. Correlation Coefficients Between Total Scores and Scores of Each Indicator for Doctorate-Master's Type

Correlation	Total score	Reputation	Total scores of quantitative indicatorse	Student selectivity	Faculty resources	Financial resources	Research output	Enrollment rate	Graduation rate	Internationa-lization
Total score	1.00									
Reputation	0.94	1.00								
Total scores of quantitative indicators	0.99	0.88	1.00							
Student selectivity	0.88	0.83	0.87	1.00						
Faculty resources	0.82	0.65	0.87	0.79	1.00					
Financial resources	0.70	0.61	0.73	0.71	0.55	1.00				
Research output	0.94	0.86	0.94	0.79	0.76	0.61	1.00			
Enrollment rate	0.41	0.50	0.35	0.27	0.09	0.22	0.29	1.00		
Graduation rate	0.08	-0.02	0.13	-0.07	0.08	-0.05	0.04	0.07	1.00	
Internationa-lization	0.36	0.40	0.32	0.27	0.29	0.20	0.25	-0.01	-0.17	1.00

Source: Tamkang University (2008). *2008 Academic rankings of universities in Taiwan*. Taipei: Tamkang University.

Table 9. Correlation Coefficients Between Total Scores and Scores of Each Indicator for Baccalaureate Type

Correlation	Total score	Reputation	Total scores of quantitative indicatorse	Student selectivity	Faculty resources	Financial resources	Enrollment rate	Graduation rate	Internationa-lization
Total score	1.00								
Reputation	0.86	1.00							
Total scores of quantitative indicators	0.89	0.53	1.00						
Student selectivity	0.58	0.25	0.71	1.00					
Faculty resources	0.37	0.15	0.55	0.59	1.00				
Financial re-sources	0.63	0.36	0.69	0.34	0.33	1.00			
Enrollment rate	0.63	0.56	0.51	-0.01	-0.05	0.20	1.00		
Graduation rate	0.01	-0.16	0.16	0.10	-0.17	-0.26	-0.10	1.00	
Internationa-lization	0.24	0.34	0.10	0.09	-0.11	-0.02	0.05	-0.12	1.00

Source: Tamkang University (2008). *2008 Academic rankings of universities in Taiwan*. Taipei: Tamkang University.

3.4 HEEACT Global Ranking

The other ranking was developed by Higher Education Evaluation & Accreditation Council of Taiwan in 2007. It is a global ranking titled "*Performance Ranking of Scientific Papers for World Universities*" to reflect universities' performance in terms of their research output and the outcomes had been published in 2007 and in 2008. The HEEACT global ranking employs data drawn from SCI and SSCI to evaluate universities' research performance. It considers publishing in international peer reviewed journal as the predominant mode of scientific research output, thus taking statistics on articles published in listed publications as an effective indicator of reflecting universities' research performance (HEEACT, 2008a). It claims that analyses of SCI and SSCI make global university ranking fairer, with an emphasis on both quality and quantity of publications. It also takes account of recent research performance in order to make a fair comparison between institutions with different length of history. And it incorporates average number of criteria in its calculation of the score, so as to

prevent a predominance of large universities. In 2008, HEEACT published an additional edition based on institutional size in order to minimize its impact on the final outcome (see Table 10 and Table 11).

Besides, HEEACT also developed a new global ranking by field and published top 300 institutions in each field in 2008. 6 fields include Agriculture & Environment Sciences, Clinical Medicine, Engineering & Computing, Technology, Life Sciences, Natural Sciences, and Social Sciences.

Table 10. Criteria and Weighting in HEEACT Global Ranking

Criteria	Indicators	Weight	
Productivity	Number of articles in the last 11 years (1997-2007)	10	20
	Number of articles in the current years (2007)	10	
Impact	Number of citations in the last 11 years (1997-2007)	10	30
	Number of citations in the last 2 years (2006-2007)	10	
	Average Number of citations in the last 11 years (1997-2007)	10	
Excellence	H-index of the last 2 years (2006-2007)	20	50
	Number of highly cited papers (1997-2007)	15	
	Number of articles in high-impact journals in the current year (2007)	15	

Source: HEEACT (2008). Performance ranking of scientific papers for world universities. Retrieved February 26, 2009, from http://www.heeact.edu.tw/ranking/index.htm

According to the 2008 HEEACT global ranking outcomes, institutions in US and UK still play predominant positions in the international higher education landscape. It is noteworthy that all the world's top 10 universities in the table are US universities, while only two universities in the Asian-Pacific region are ranked within the world's top 30 universities, and both of them are from Japan. Moreover, there are five Taiwan universities on top 500, including National Taiwan University (141), National Cheng Kung University (328), National Tsing Hua University (366), National Chiao Tung University (463), and National Yang Ming University (475), compared to 4 in 2007 (HEEACT, 2008a) (see Table 12).

Table 11. Top 10 World Universities in 2008 HEEACT Global Ranking

World Rank	Countries	National Rank	Institutions	Total Score	Total Score by Number of Faculty	Rank by Number of Faculty
1	USA	1	Harvard University	96.27	96.27	1
2	USA	2	Johns Hopkins University	50.93	50.93	7
3	USA	3	Stanford University	50.01	66.78	2
4	USA	4	University of Washington - Seattle	49.04	43.36	13
5	USA	5	University of California - Los Angeles	47.09	45.79	9
6	USA	6	University of California - Berkeley	46.27	48.89	8
7	USA	7	University of Michigan - Ann Arbor	46.23	41.37	17
8	USA	8	Massachusetts Institute of Technology	44.92	65.99	3
9	USA	9	University of California - San Francisco	43.29	53.09	4
10	USA	10	University of California - San Diego	42.88	51.30	6

Source: HEEACT (2008). *Performance ranking of scientific papers for world universities*. Retrieved February 26, 2009, from http://www.heeact.edu.tw/ranking/index.htm

Table 12. Ranks of Taiwan's Universities in HEEACT Performance Ranking for World Universities (2007-2008)

Taiwan Institutions	2007	2008	2008 Rank by Number of Faculty
National Taiwan University	185	141	114
National Cheng Kung University	360	328	204
National Tsing Hua University	429	366	260
National Chiao Tung University	471	463	327
National Yang-Ming University	/	475	385

Source: HEEACT (2008). *Performance ranking of scientific papers for world universities*. Retrieved February 26, 2009, from http://www.heeact.edu.tw/ranking/index.htm

3.5 HEEACT Personalized Ranking

Due to fact that traditional college rankings have many fatal methodological problems which could not be solved at present, a new type of user-based ranking, called "Personalized College Ranking" started to develop in many nations in the late 1990s. Up to now, there are five major personalized college ranking systems established either nationally or regionally. The first personalized college ranking

called "University Ranking" was published by Centre for Higher Education Development in Germany in 1998. The other 4 new ones published after 2000 are Canadian Maclean's "Personalized Ranking Tool" in 2006 and GlobeMail in 2007, Holland "Studychoice.nl" and British The Times' "Push" in 2007.

As a quality assurance agency, the HEEACT plays the role of publishing more transparent information about college and universities in Taiwan for students in order to make well-informed choices in selecting where to go to study, with more than 160 Taiwan higher education institutions. Though many of the current national or global rankings present university data, they neither cover all universities in Taiwan nor provide the teaching quality information that local and international students urgently need (Hou, 2008).

The ideas underlying the pilot project "College Navigator" launched by the HEEACT is that there is need for such a tool because of the evolution of higher education expansion and internationalization. Based on five personalized rankings above, the HEEACT outlined possible strategies and pathways for establishing personalized college ranking in Taiwan since 2008.

Different from classic rankings, users of "College Navigator" are given a certain extent of autonomy over selection of indicators and weightings. It means that they will be able to select the indicators within criteria and weigh each one by their own judgment. In addition, users will be able to rank the institutions they are interested in by region, type, size and program. More detailed information on universities such as founding year, mission, and total enrollment, number of programs, and website, accreditation status, government funding, application, room and board, tuition will be listed for user's references on the ranking outcomes. There are 4 tiers in the model of criteria including 11 criteria, 24 indicators, 5 preferences and 20 items (see Table 13).

Table 13. Model of Criteria

Tier	Content	Number
Criteria	Academic survey, student quality, faculty resources, library acquisitions, research grant, research output, teaching quality, learning output, international outlook, etc.	11
Indicator	Enrollment rate, proportion of graduate students, graduation rate, proportion of faculty members above assistant professors, proportion of professors with a highest degree, proportion of full-time faculty, student/faculty ratio, total expenditure per student, number of articles published in SCI/SSCI/AHCI per faculty, National Science Foundation grants per faculty, proportion of international students, proportion of international faculty, library expenditure per student, number of patents awarded per faculty, etc.	24
Preference	Location, size, type, program/discipline, etc.	5
General information	History, enrollment, number of programs, and website, room and board, student service, accreditation status, governmental grants, scholarship, tuition, student clubs, accommodation, etc.	16

Source: Author.

3.6 Comparison among Three Rankings

The three Taiwan rankings have their own purposes, users and methodology. Initially regarded as a tool for national benchmarking, Tamkang's "Academic Ranking of Universities in Taiwan" was expected to provide Tamkang University relevant information for quality control and self-enhance. Hence, it is published only in print but it is sent to all ranked schools for their reference. Recently, these rankings have often been used by local colleges and universities as an important academic report of the current condition of Taiwan higher education.

Different from Tamkang national ranking, the major goal of HEEACT's "Performance Ranking of Scientific Papers for World Universities" (SPWU) is to evaluate the current scientific paper performances on top 500 world universities in order to find out the gap between Taiwan universities and them (HEEACT, 2008a). Also, the HEEACT global ranking attempts to provide universities in the newly small developed nations insights into ideas of the development of research universities. In addition, the HEEACT is obligated to offer related internationally comparable data and information like SPWU for the Taiwanese government for the purpose of higher education policy making. Since there was only 4 Taiwan institutions in the top 500, in some senses, the HEEACT global ranking provoked severe criticism over its methodology and purposes from

Taiwan college presidents and some board members of HEEACT. The MOE was under pressure to claim that SPWU would not be adopted as the only criteria in selecting the universities who applied for 5-year 50 Billion Program.

As to the new HEEACT "College Navigator" with a consumer-based mission, it should not be viewed a real ranking in the traditional sense. The main reason is that the college navigator gives individual users the opportunity to establish their own rankings according to a number of self-chosen criteria. Moreover, the website just gives robust information (distinguishing only top-middle-bottom groups per indicator), like CHE ranking, not spuriously precisely simple and overall ranking (Hou, 2008).

Table 14. Characteristics of the 3 Taiwan Rankings

	Tamkang	HEEACT Global	HEEACT Personalized
History/YEARS DONE	7	3	1
Goal	Institutional self enhancement / National benchmarking	International competitiveness / global benchmarking	College guide
Type	National	Global	National
Ranker	University	Evaluation agency	Evaluation agency
Selection of Universities	135 local universities	500 world university	68 universities evaluated by HEEACT
Number of Indicators	15	8	24
Nature of Indicators	Reputation / Learning input (staff) / Research output	Research output focus	
Users	Local universities	International top universities	Local and international students
Source	Institution / Third party database / Academic Survey	Third party database	Third party database / Academic survey
Presentation	Academic written report	Website	Website
Language	Chinese	Chinese & English	Chinese & English

Source: Author.

3.7 Impact of College Ranking on Taiwan Universities

In the 3rd IREG Meeting, Mersotis (2007) stated that rankings of higher education institutions have emerged as a major force in what can be characterized as accountability marketplace for higher education quality. Though it is often argued that educational quality is "really in the eye of the beholder and there are

many possible definitions of quality, any single set of rankings will inevitably do an injustice to other definitions of quality," rankings better than accreditation as a convenient heuristic device makes the complexities of academic performance of institutions understandable, providing the public with more precise data (Usher, 2008).

In the recent years, quality and excellence in higher education become major concerns in Taiwan society. As higher education globalizes, the pressure from international competitions and accountability will accelerate the importance of ranking and assessment in Taiwan higher education. More importantly, a semi-government agency, like HEEACT, launched the global ranking project adopted as a tool for allocation of the governmental funding, which lead to apprehension of Taiwan universities, particularly research universities. Moreover, the Tamkang ranking has also started to attract national attention of comprehensive universities and has been adopted as national benchmark by some Taiwan colleges.

Another recent trend is that more and more Taiwan institutions are using the performance indicators of the annual ranking reports as a tool of self-enhancement and changed their institutional policies in some aspects in response to the ranking. Take Tamkang University for example, Directors of Board requests university administration to make a self-improvement plan based on each indicator of the annual ranking outcome. Besides, some schools attempted to reallocate resources and revise the faculty reward system in order to improve their weaknesses in the indicator of research output. Some formed a task force to make a short-term and a long-term strategies on how to achieve the designated rank several years later.

Taiwan's high school students, in fact, have suffered from a lack of transparent information to help them make a good selection of a college for a long time. Following the global trend of rankings, the development of "College Navigator in Taiwan" is an innovation for most institutions but it's expected that it will be of more interest to high school age students. According to an on-line survey with a total of 11 questions regarding the quality of the college navigator's indicators and the functions of the web-based system, the results showed that users were highly satisfied with the quality of the speed, the convenience, and the web pages of the system. On the other hand, they

were dissatisfied with three items, including "selection of indicator number", "presentation of ranking outcome" and "presentation of general information for each institution." To conclude, users agreed on the role of the system as an information provider but expected to have more autonomy over the selection of indicator number and to have more transparent data about colleges and universities (see Table 15).

After its publication in 2009, it is foreseen that the more helpful the college navigator system is for targeted users, the more it will become an issue and concern among Taiwan universities and colleges in terms of how it's impacting them.

Table 15. Mean Scores for Users' Attitude toward the Function of the Ranking

Questionnaires	Mean score
Q1. Definitions of indicators are clearly stated.	3.73
Q2. Selection of indicator number is reasonable. (Between 5-10)	3.63
Q3. Presentation of ranking outcome is clear and understandable.	3.66
Q4. Presentation of basic information for each institution is clear and understandable.	3.69
Q5. Information provided is useful for me to select a school to study.	3.76
Q6. It is convenient for me to operate this ranking tool.	4.06
Q7. Speed of this system is moderate and does not take me too much time.	4.23
Q8. Functions in the system are highly stable.	3.91
Q9. Web pages are presented clearly.	4.16
Q10. Contrast of color is nice and comfortable.	3.81
Q11. Information on the web-pages is easily read.	3.93

Source: Author.

On the other hand, an analysis that correlations among the outcomes of Tamkang Ranking and HEEACT global ranking and the 5-year 50 Billion Program finds that 10 Taiwan research universities with a massive amount of governmental funding ranked at the top on the national Tamkang ranking, seem to be ranked high as well on HEEACT global ranking (see Table 16). Table 17 shows the correlation among 5-year 50 Billion Program funding, the total scores of HEEACT and Tamkang rankings for 10 Taiwan research universities. Two of the correlation coefficients between funding and total scores of HEEACT ranks are above 0.98. The total scores of Tamkang ranking also correlate well with

funding higher than 0.6, indicating that government funding is a major factor for determining the overall academic performance of a research university in both the global and national rankings. However, what makes the major gap between HEEACT and Tamkang rankings from 0.98 to 0.6 is likely that research output only contributed to 25% weighting in Tamkang in contrast to 100% weightings in HEEACT ranking.

Table 16. 10 Taiwan Universities by Funding, Ranks and Total Scores

Institution	Funding	HEEACT Rank				Tamkang Rank	
		Original		per Faulty			
National Taiwan University	9000	141	**17.23**	114	22.97	3	90.85
National Cheng Kung University	5100	328	**10.49**	204	18.17	2	91.14
National Tsing Hwa University	3200	366	**9.46**	260	16.13	1	92.39
National Jiao Tong University	2500	463	**7.82**	327	14.31	5	89.26
National Central University	1900	/				6	87.08
National Sun Yat-sen University	1800	/				7	86.34
National Yang-Ming University	1500	475	**7.66**	385	12.02	4	89.38
National Chung Hsing University	1250	/				9	83.13
National Chengchi University	800	/				12	80.63
Chang Gung University	800	/				11	81.52

Source: Author.

Table 17. Correlation Coefficients among Funding, Total Scores of HEEACT and Tamkang Rankings

	Funding	HEEACT Rank (Original)	HEEACT Rank (per Faulty)	Tamkang Rank
Funding	1.00			
HEEACT Rank (Original)	0.98	1.00		
HEEACT Rank (per Faulty)	0.99	0.96	1.00	
Tamkang Rank	0.65	0.33	0.47	1.00

Source: Author.

4. Conclusions

Rankings are inevitable and probably necessary in the competitive and market-oriented academic world of the 21st century, as Altbach noted, they focus attention on key aspects of academic achievement, which may influence policymakers in higher education and students' choices of universities. Yet,

current rankings often measure some parts of higher education with their flawed metrics, which ignore key academic roles such as teaching and do not look at all, at how students are affected by their academic experience. When it comes to the pitfalls and challenges of rankings, in summary, there are two major concerns in creditability of ranking. The first one is validity. All ranking systems assess and compare institutions on a range of indicators. There are, in fact, no widely accepted indicators for measuring the academic performance of higher education institutions, particularly teaching quality and the impact of education on students in such areas as student engagement and measuring how much students actually learn. Hence, it is very difficult for the current university rankings to accurately measure the quality of a single institution.

The second concern is reliability. Most ranking systems adopted three steps to come up with their final ranking outcomes. These steps are: data collection from surveys, databases or institutions, data weighting and aggregation. Since there are similarities and differences in the methodologies used by most ranking systems, there might be different outcomes among them instead.

But no matter how many problems there are in the rankings, social demand for data transparency through the different mechanisms of quality assurance is the central and strong. In 2004, the IREG (International Ranking Expert Group) was formed to consider a set of quality measurements in higher education rankings, and in 2006, the IREG published the *Berlin Principles on Ranking of Higher Education Institutions*.

This initiative tried to set up a framework to refine and improve ranking methodology.

In Taiwan, rankings have become a controversial issue that most universities complain about while they have attained legitimate status in the eyes of the general public. For the general public, such as students, parents, and the government, rankings are more readable and easily understood; in contrast, for institutions, they think that rankings do measure the wrong things with a set of simple indicators. With no attempt to weigh the indicator and assign ordinal ranks arbitrarily by the ranker, the HEEACT personalized college ranking have been developed to respond the trend of internationalization in higher education and respect the personal need of each user according to the *Berlin Principles*.

The fact that Taiwan has all three types of rankings -- national, global and personalized -- will result in increased visibility for Taiwan among those who follow and compile rankings around the world. Taiwan is firmly part of global discussions of how rankings should be done and how rankings should evolve. The users of rankings in Taiwan and those that produce them will benefit from being part of this global trend. Many in higher education outside of Taiwan view the development of rankings in Taiwan as a clear signal of how serious the country takes the challenge of improving its higher education standards and institutions.

However, no matter what type of the rankings they are, the big challenge for those that compile and publish them is to ensure that they can provide accurate and relevant assessments, and measure the right things for target groups. In the future, it can be assured that the development of Taiwan rankings will continuously pressure colleges and universities in Taiwan to improve their academic performance and to provide more information which students need, in order to promote quality and international visibility of Taiwan higher education.

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