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A decade of change: The past 10 years of Taiwan higher education institutions

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Abstract

Taiwan higher education institutions are facing great challenges arising from both global and local sources. Global pressures brought forth by need to have a presence within the global university ranking systems (or league tables), while local pressures that stem from the declining number of incoming students. To remedy these dilemmas, the Taiwan Ministry of Education and higher education institutions are working hand in hand focusing on both policy and financial aspects of the academe. This presentation shall focus on providing an overview of what has happened for the past decade, while also summarizing past and ongoing strategies such as institutional mergers, rebranding/transformation of degree programs, changing academic profession, further expansion of international enrollments, and developing the quality of research through the establishment of institutional review boards (IRB) or research ethics committee (REC), and institutional research (IR) centers. Ultimately Taiwan higher education institutions are seeking to expand its institutional competitiveness while struggling with the myriad challenges of the academe.

Keywords: governance; policy; restructure; neoliberal management; competitive advantage; institutional performance; funding

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1. Introduction

Similar with most countries in the Asian region, the global university ranking systems or the university league tables have greatly influenced Taiwan higher education institutions (HEIs) (Lo, 2014). With the notion that becoming a world-class university is synonymous to being able to make it into the list of the top tier institutions within the league tables (Hazelkorn, 2015; Salmi, 2009); in effect, HEI funding policy changes in Taiwan are being tailored towards enhancing scores within these league tables' criteria (Deem, Mok, & Lucas, 2008; Grewal, Dearden, & Llilien, 2008; Lynch, 2014; Mok & Chan, 2008). However, such policy changes have been faced with outcry of inequality (Hou, Ince, & Chiang, 2013; Song & Tai, 2007), more specifically, is with the strong emphasis on academic publication within the journals listed in the Thomson Reuter's ISI citation databases (Ching, 2013a, 2013b; Chou, Lin, & Chiu, 2013; Huang, 2009).

Emphasis on publishing within these journals has been tainted with both facts and fallacy, such as the criteria for research grants and awards, promotion of faculty, to the graduation requirement of some doctoral programs. With these having said, it would seem that Taiwan HEIs are being *challenged to perform beyond their local boundaries* (e.g. publishing in a non-native language such as English instead of Chinese). More important, is that, since most of the available funding is formulated in such a way that HEIs should outperform each other (e.g. the higher number of publications translate to larger amount of funding), it is therefore imperative that universities comply with the rules, so as to able to get into the number game.

Looking within the local situation, Taiwan is plague with a serious problem of declining birth rate. According to the National Statistics office of Taiwan, the annual birthrate has been declining since 1985. Record shows that the figure of 344,101 childbirths in 1985 steadily dropped to more than half with the lowest of 166,473 childbirths in 2010, however, with some upward surges during the Chinese Zodiac year of the Dragon (e.g. 1988, 2000, and 2012, see figure 1 for more details). Also note the lowest during the Chinese Zodiac year of the Tiger (e.g. 1986, 1998, and 2010).

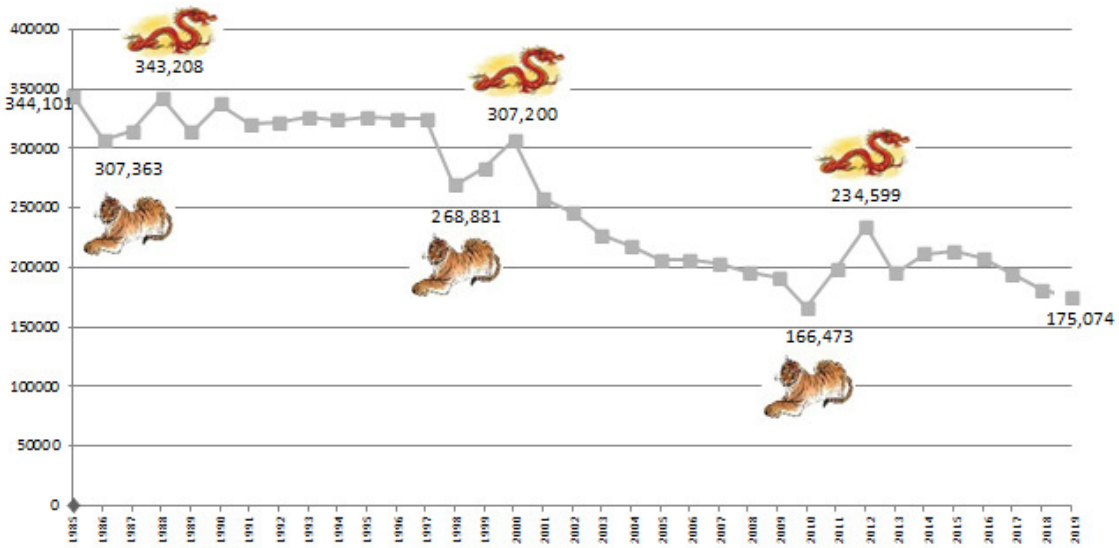

Figure 1. Taiwan declining birthrate.

Note. Dragon and tiger denotes Chinese Zodiac for the specific year.
Source. Taiwan Statistics (https://www.stat.gov.tw)

To increase the population, provisions for monetary and other incentives are placed to encourage childbirths (Branigan, 2012), still, this persisting downward spiraling birth rate, would translate to lesser and lesser students. Hence, this situation would cost a lot of future financial difficulties for academic institutions (Chen & Chang, 2010). It is expected that by the opening of the school year 2016/17 in September 2016, there will be huge drop of around 20,000 university freshmen enrollees (Chang, 2014). In reality, during the 2017/18 school year a dropped of around 30 to 32 percent was felt (Fulco, 2018). By 2028, there will be less than 160,000 new freshmen students left, causing much concern within the academia (Green, 2020).

Table 1 shows the past, current, and projected numbers of incoming freshmen students from the Taiwan Ministry of Education (MOE) together with the existing number of HEIs. Note the steady drop of around 10,000 students per school year starting 2018, with the estimated lowest number of only 159,000 students in 2028. Worth looking into is the actual impact of the decreasing number of students, analyzing the data shows some alarming issues. Table 2 shows that the enrollment changes are mostly affecting private HEIs. In other words, the decreasing number of incoming students is mostly reflected in private HEIs. In reality, when given a chance, students would flock to the national (public) HEIs; as compared to the higher tuition requirement in private institutions, in addition to the somewhat "high" status attached to studying in a national (public) HEI.

Table 1

Past, current, and projected number of incoming university first-year students

School year	Incoming freshmen	Number of HEIs*	School year	Incoming freshmen
2001	276,000	154	2020	214,000
2006	267,000	163	2021	204,000
2011	276,000	163	2022	192,000
2012	278,000	162	2023	187,000
2013	271,000	161	2024	181,000
2014	272,000	159	2025	178,000
2015	273,000	158	2026	178,000
2016	254,000	158	2027	173,000
2017	239,000	157	2028	159,000**
2018	252,000	153	2029	165,000
2019	243,000	152	2030	193,000

Note. *Including all public, private, universities, technical vocational universities, and colleges. **Projected lowest number of students. *Source*. https://stats.moe.gov.tw

Table 2

Actual freshmen enrollment from SY 2010-2015

School year	Public	% change	Private	% change	Total	% change
2010	66,027	0.25%	180,247	3.87%	246,274	2.79%
2011	66,622	0.90%	187,260	3.89%	253,882	3.09%
2012	67,298	1.01%	188,400	0.61%	255,698	0.72%
2013	67,362	0.10%	181,599	-3.61%*	248,961	-2.63%*
2014	68,344	1.46%	182,024	0.23%	250,368	0.57%
2015	68,917	0.84%	179,759	-1.24%*	248,676	-0.68%*

Note. *Negative value denoting the number of students dropped. *Source*. https://stats.moe.gov.tw

Furthermore, besides the decreasing new entrants students, overall student population of the private HEIs are steadily decreasing, while minimal impact are felt for the national institutions. In actuality, it is only these few years that public HEIs are having a decreased in overall student population (a decrease of around .2 to .3 percent). Table 3 shows that during the 2011/12 school year, there were around 753,935 students enrolled in private universities, however this went down to around 643,855; a decrease of 110,080 students, an almost drop of 15%. While the public or national universities from 279,050 to 288,663; an actual increase of 9,613 students. These figures are a troublesome statistical truth for the private higher education sector in Taiwan. Hence, many are now trying to find ways either to restructure its course programs or to attract international student enrolments.

Table 3

Total student population from 2011 to 2019

School year	Private HEIs		Public HEIs	
2011	753,935		279,050	
2012	757,693	0.5%	280,348	0.5%
2013	754,217	-0.5%	281,317	0.3%
2014	753,208	-0.1%	283,854	0.9%
2015	748,189	-0.7%	287,029	1.1%
2016	726,066	-3.0%	289,332	0.8%
2017	695,661	-4.2%	290,266	0.3%
2018	672,636	-3.3%	289,269	-0.3%
2019	643,855	-4.3%	288,663	-0.2%

Source. https://stats.moe.gov.tw

As for Table 4, note that comparing 2008 to 2019 school year, it would seem that the number of both public and private universities are increasing (public: from 41 to 45, private: from 60 to 81). However, careful analysis of the detailed yearly changes would depict that colleges (including junior colleges) are actually transforming, upgrading, and diversifying their course offerings and transition into either a traditional (comprehensive) university or into university of science and technology (technical vocational university). Consider the various transformation and changes; the total number of institutions has actually decreased from 160 to 152.

Table 4

Changes in HEIs numbers

School	Junior colleges		Colleges		Universities		Overall
Year	Private	Public	Private	Public	Private	Public	
2008	12	3	37	7	60	41	160
2009	12	3	35	8	63	41	162
2010	12	3	30	5	67	44	161
2011	12	3	27	4	70	45	161
2012	12	2	24	4	73	47	162
2013	12	2	22	3	75	47	161
2014	12	2	20	1	76	48	159
2015	11	2	18	1	78	48	158
2016	11	2	18	1	78	48	158
2017	11	2	14	1	82	47	157
2018	10	2	13	1	82	45	153
2019	10	2	13	1	81	45	152

Source. https://stats.moe.gov.tw

These transformations are only part of the solution for the lack of incoming students. In preparation for the decreasing number of students, there are many ongoing plans and talks of mergers between key national universities and probably closure of several low performing universities (Leung, 2013). While, at the same time, the MOE encourages HEIs to become more internationalized and start accepting more foreign students (Chou, 2014). Therefore, these additional enrollments of foreign students are seen as an opportunity to fill-up for the oversupply of Taiwan HEIs. With the numerous scholarships made available to attract international students to study in Taiwan. Still, challenges exist in the provision of an all English taught course program within a non-English speaking nation like Taiwan (Lee, 2010).

2. Performance outcomes

Previously, Hou et al. (2013) provided an overview of the Taiwan's research excellence initiatives together with their outcome scores, more specifically on the results of the first term of the *Project for Developing Top-Notch Universities* (PDTNU; also known as the *Plans to Develop World-Class Research Centers*). They noted the increased in most of the indicators, however fears of over stressing on research over teaching, which will ultimately change the nature of a university.

Starting 2011, the MOE continued the funding of universities in order to promote world-class research centers. Table 5 shows the information regarding the second term of the PDTNU; note that funding was given twice from April 2011 to March 2014 and April 2014 to December 2016 with varying amounts per year. Also shown is the almost doubled amount of funding for the last leg of the project. Besides the regular 12 HEIs (#1 to #12 in Table 5), additional HEIs are funded because of their uniqueness in certain research fields; inclusion of 2 HEIs starting 2011 (#13 and #14) and 3 HEIs starting 2014 (#15 to #17). To clarify, these additional funding is actually for the specialized research centers within these HEIs, hence, the school itself cannot use the grant for other purposes.

Table 5

Funding and ranking performance of key HEIs in Taiwan

#	University	0411 – 0314[*1]	0414 – 1216[**1]	2012 QS[2]	2015 QS[2]	2012 ARWU[3]	2015 ARWU[3]
1	National Taiwan University	103.33	200.00	80	70	101-150	151-200
2	National Cheng Kung University	53.33	103.33	271	224	201-300	301-400
3	National Tsing Hua University	40.00	82.00	192	155	201-300	201-300
4	National Chiao Tung University	33.34	68.66	238	182	301-400	301-400
5	National Central University	23.33	47.34	401-450	397	401-500	-
6	National Yang Ming University	16.66	33.34	285	338	401-500	-
7	National Sun Yat-Sen University	15.00	26.67	451-500	379	401-500	401-500
8	National Chung Hsing University	10.00	20.00	600+	501-550	-	-
9	Chang Gung University[+]	6.67	12.67	451-500	461-470	301-400	401-500
10	National Chengchi University	6.67	12.67	551-600	651-700	-	-
11	National Taiwan University of Sci. & Tech.	6.67	11.33	396	260	-	-
12	National Taiwan Normal University	6.67	13.33	451-500	376	-	-
13	National Taiwan Ocean University[***]	3.33	8.33	-	-	-	-
14	National Chung Cheng University[***]	3.33	3.33	-	-	-	-
15	China Medical University[***+]		3.33	-	-	401-500	301-400
16	Taipei Medical University[***+]		3.33	323	421-430	-	-
17	Yuan Ze University[***+]		2.00	-	-	-	-
18	Fu Jen Catholic University[+]			601+	701+	-	-

Note. [*]Funding period April 2011 to March 2014, computed in millions of USD each year using the exchange rate of 1 USD = 30 NTD.
[**]Funding period April 2014 to December 2016, computed in millions of USD each year using the exchange rate of 1 USD = 30 NTD.
[***]Special research centers. [+]Private HEIs. Shaded figures denote decrease in ranking performance.
Source. [1]http://140.113.40.88/edutop/index_1.php [2]http://www.topuniversities.com/ [3]http://www.shanghairanking.com/

Table 5 also shows that among the funded HEIs only 4 are private institutions and 3 of which are medical universities, noting the inclination towards the field of nature and science. Data also shows that for the QS World Rankings of the funded HEIs with majority of them garnering improved standings. However, for the Academic Ranking of World Universities (ARWU) results, only 1 research center improved, while the rest either are unchanged or declined in their standing. In addition, a check for other unfunded HEIs listed in the QS World Rankings showed that only Fu Jen Catholic University was included. As with the ranking methodology are quite different between the QS World Ranking and ARWU (Huang, 2011; Marginson, 2014), hence, comparison of the results between the two system might sometimes varies.

More recently, Table 6 provides the current rankings of several top-tier HEIs in Taiwan. Within the data, we can find that science (mostly nature and medical fields) inclined universities still have the upper hand in gaining higher rankings as compared to non-science (social science or comprehensive universities). Table 6 also provided the various overall ARWU and QS rankings for 2020 and 2021. It is also noted that QS currently provide additional rankings based on domain (or subject) classification, to further cater to the needs of the different fields of study. Nonetheless, institutional rankings are evolving to provide a better picture of a university (Peterbauer, 2020).

Looking back, as with the evident nature of the PDTNU, which is to promote research excellence in HEIs, the Taiwan MOE also launched the Program for Rewarding Teaching Excellence of Universities (PRTEU; for teaching universities and university of science and technology) in order to develop other HEIs categorized as teaching and technical vocational universities. Table 7 and 8 shows the amount of funding provided for the various HEIs within the past years, together with the overall funding allocation for private institutions. Although data from each of the HEIs with regards to QS and ARWU are not available, their total outcome performance

can be aggregated into the entire country performance analysis. Also note that within this funding scheme, a large number of private HEIs are included. However, looking at the amount of funding, it is easy to compare the inequalities towards the teaching and technical vocational universities.

Table 6

Current rankings of top tier universities in Taiwan

University	Local ranking	ARWU 2020	Overall QS 2021
China Medical University (Taichung)	1-2	201-300	
National Taiwan University	1-2	201-300	66
National Cheng Kung University	3	301-400	234
National Chiao Tung University	4-5	401-500	240
National Tsing Hua University	4-5	401-500	168
Chang Gung University	6-7	501-600	493
National Yang Ming University	6-7	501-600	298
National Sun Yat-Sen University	8-9	601-700	416
Taipei Medical University	8-9	601-700	387
Kaohsiung Medical University	10-11	701-800	
National Central University	10-11	701-800	465
National Taiwan University of Science and Technology	12	801-900	267
Asia University, Taiwan	13-15	901-1000	
National Chung Hsing University	13-15	901-1000	601-650
National Taiwan Normal University	13-15	901-1000	331
National Taipei University of Science and Technology			488
National ChengChi University			581-590
National Chung Cheng University			801-1000
Fu Jen Catholic University			801-1000

Source. http://www.shanghairanking.com/ and https://www.topuniversities.com/university-rankings

Table 7

Funding for teaching and technical vocational universities

Year	University*			Year	Technical-vocational University**		
	Public	Private	Total funding[1]		Public	Private	Total funding[1]
2005	1	6	40.96	2006	9	21	47.34
2006	4	7	61.67	2007	9	21	47.34
2007	14	16	57.65	2008	9	22	45.94
2008	12	17	58.69	2009-2010	8	24	47.90
2009-2010	11	20	74.40	2011-2012	9	25	49.83
2011	11	20	51.40	2013-2014	9	29	48.27
2012	11	20	51.64	2015-2016	9	25	46.58
2013	11	22	52.50				
2014	11	22	52.50				
2015	8	24	52.26				
2016	8	24	52.26				

Note. [1]Computed in millions of USD each year using the exchange rate of 1 USD = 30 NTD.
Source: *http://www.csal.fcu.edu.tw/edu/program_petitionA.aspx **http://www.edu.tw/

Table 8

Overall funding for the private institutions

School year	Funding	School year	Funding
2004-2005	219.18	2011-2012	189.01
2005-2006	220.92	2012-2013	182.46
2006-2007	220.92	2013-2014	183.64
2007-2008	220.92	2014-2015	185.49
2008-2009	199.30	2015-2016	187.16
2009-2010	196.25	2016-2017	193.42
2010-2011	196.80	2017-2018	194.72

Note. [1]Computed in millions of USD each year using the exchange rate of 1 USD = 30 NTD.
Source. https://stats.moe.gov.tw

More recently, the Taiwan MOE (2020) reported that the recent Higher Education Sprout Project (HESP) is doing quite well. The HESP is the 86.85 billion NTD (new Taiwan dollars) project starting from 2018 for five years. Its plan is to divided into two parts, the first part aims to comprehensively enhance the quality of universities and promote the diversification of higher education so as to secure students' equal right to education. The second part, which aims to reinforce international competitiveness through facilitating universities to achieve world-class status and developing cutting-edge research centers, will cooperate with the Ministry of Science and Technology together with funding support (MOE, 2020). It is hoped that the HESP is able to spark another growth surge for the institutions in Taiwan.

Looking at the entire country performance, Table 9 shows the overall annual amount of funding for research and development in Taiwan. Note that the source of funds is around 70% to 75% from the business enterprise sector, while the remaining is from the government. As for the expenditure, similar to around 70% to 75% is for the business enterprise sector, an average of around 15% for government research, and the remaining for HEIs (Ministry of Science and Technology, 2015). As for the overall country performance outcome, Table 9 and 10 shows the total number of articles published in the ISI databases, note the slight annual increase with the exception of 2014. Taiwan ranks around the 16th to the 17th placed globally. While, the papers in the Engineering Index (EI) shows both upward and downward fluctuations each year, however on average more than 20,000 papers are published annually. Taiwan ranks around in the 14th placed within the global EI standing.

Table 9

Ministry of Science and Technology funding and overall performance outcome

Indicator/Year	2010	2011	2012	2013	2014
R&D expenditure[1*]	13,194	13,813	14,450	15,255	16,116
% GDP[*]	2.80	2.90	2.95	3.00	3.00
Papers in Thomson Reuters ISI[**]	24,401	26,705	27,061	27,533	26,946
Papers in EI[1*]	20,302	22,819	20,729	24,415	22,706
Papers in Scopus[***]	40,103	42,906	42,848	43,006	37,966
SJR - Total citations[***]	38,832	41,433	41,235	41,256	35,926

Note. [1]Computed in millions of USD using the exchange rate of 1 USD = 30NTD. Shaded figures denotes decrease in number.
Source: [*]2015 Indicators of science and technology (p. 6), by Ministry of Science and Technology, 2015, Taipei: MOST.
[**]http://webofknowledge.com [***]http://www.scimagojr.com/

In addition, Table 9 and 10 also includes the total number of publications within the Scopus database and together with the total number of citations (Table 9). Results show similar upward increased with a drop on 2014, while, the global rank of Taiwan is around **15th** to the **17th** placed. As with the battle for academic citation index database between Thomson Reuters' ISI (or sometimes refer to as Web of Science) and Scopus continues, many have started to compare their impact in the ranking system (Jacsó, 2010). With the Times Higher Education (THE) ranking starting 2014 and QS have since been using Scopus as a source for publication and citation counts. As a result, many HEIs in Taiwan have also started to make available the Scopus portal within their libraries as an alternative for Web of Science. Also note that the number of papers within both databases is quite comparable with Scopus having higher inclusions than ISI. Many institutions are actually looking into Scopus as a basis of performance indicators (Prathap, 2013; Yap, 2012).

Table 10

ISI and Scopus performance for the past six years

Year - Month	ISI	Scopus
2020 - Nov	33,349	
2019	36,238	38,038
2018	33,697	36,814
2017	33,955	37,715
2016	34,582	38,004
2015	33,324	38,609

As for the reason in the decreased in performance outcome in 2014 seems uncertain, overall funding for that period actually increases or remains unchanged. However, it is noted that the number of graduate students (more specifically doctoral students) have been declining since 2010 (see Table 11). Some have noted that the over stressing on academic publication indexed in the ISI databases have also affected graduate students. Rumors of graduation requirements and faculty requiring students to submit papers to ISI journals are all just too common. In reality, Taiwan is suffering from an oversupply of graduate students, tandem with the uncertainty of future employment (Chen, 2012). In fact, even the National Taiwan University; the top university in Taiwan, is suffering from the decreased in number of doctoral students (Wu & Chung, 2015).

Table 11

Number of graduate students enrolled in Taiwan HEIs SY 2010-2015

SY	Incoming first year				Total			
	PhD	% change	Master	% change	PhD	% change	Master	% change
2010	6,611	-3.23%	70,866	0.71%	34,178	1.27%	185,000	0.87%
2011	6,030	-8.79%	70,238	-0.89%	33,686	-1.44%	184,113	-0.48%
2012	5,688	-5.67%	70,269	0.04%	32,731	-2.84%	183,094	-0.55%
2013	5,385	-5.33%	66,357	-5.57%	31,475	-3.84%	177,305	-3.16%
2014	5,454	1.28%	66,304	-0.08%	30,549	-2.94%	172,968	-2.45%
2015	5,321	-2.44%	66,227	-0.12%	29,333	-3.98%	170,428	-1.47%

Source: https://stats.moe.gov.tw

Looking into the status of international student enrollments, statistics from the MOE shows a steady increased of foreign students (see Table 12 for more details). It is noted that majority of the foreign degree seeking graduate students are enrolled in national HEIs with National Taiwan University of Science and Technology leading, followed by National Cheng Kung University, National Taiwan University, National Chiao Tung University, and National ChengChi University. Furthermore, the number of short-term students is increasing; gap between the degree seeking and short-term students are widening. In addition, most of the students are actually from the Asian region, such as Hong Kong and Macau, Mainland China, and other Asian countries with Malaysia as the leading source of international students.

Table 12

Number of foreign students in Taiwan HEIs SY 2010-2015

SY	Degree seeking				Short-term						Total
	IS	OCS/HKM	China	sub-total	Language	Exchange	IS*	China	Training	sub-total	
2010	8,801	13,562		22,363	12,555	2,259	1,604	5,316	1,241	22,975	45,338
2011	10,059	14,045	928	25,032	14,480	3,301	2,265	11,227	1,540	32,813	57,845
2012	11,554	15,204	1,864	28,622	13,898	3,871	3,163	15,590	1,743	38,265	66,887
2013	12,597	17,055	3,554	33,206	15,510	3,626	3,915	21,233	2,160	46,444	79,650
2014	14,063	20,134	5,881	40,078	15,526	3,743	4,758	27,030	2,510	53,567	93,645
2015	15,792	22,918	7,813	46,523	18,645	3,743	4,758	34,114	2,399	63,659	110,182

Note. IS: International students, OCS: Oversea Chinese students, HKM: Hong Kong/Macau students, Language: Mandarin Language center students, Exchange: Exchange students, Training: Short-term technical training students. *Self-paid short-term international students.

With the increasing number of international students, it would be a curious question to ask whether the influx of students cover for the loss of local incoming enrollments. Studies have used the push-pull model to determine why students choose Taiwan. Key finding suggests that the opportunity to study *traditional Mandarin Chinese* and to receive *scholarships* is essential pull factors in choosing Taiwan as a study abroad destination (Roberts, Chou, & Ching, 2010). However, various studies have reported that international students in Taiwan are experiencing from both *academic* and *personal challenges* and *difficulties* (Ching, Chao, & Lien, 2014; Ching, Lien, & Chao, 2014; Chou, Roberts, & Ching, 2012; Roberts et al., 2010). More important, current research findings have shown that some students are actually suffering from high levels of depression, anxiety, and stress (Ching, Chao et al., 2014). In reality, just within this few years, there are already several reported cases of study abroad students in Taiwan (Mainland Chinese, Hong Kong/Macau, and International) harming

themselves and others (Wang, 2012; Zhang & Guo, 2014; Zhang & Hong, 2014). Such incidents emphasizes the need on focusing on the quality of *vital counseling services* for foreign students and in a wider sense the quality of *student-faculty interaction* as against the focus only on the increasing the number international enrollments.

3. Strategic initiatives

After having a glimpse of the current situation (including the dilemmas) of Taiwan HEIs, the following section shall discuss the various strategic initiatives being undertaken. Such as: talks of transformation, mergers, and closure of HEIs, evolution of course offerings (affecting the academic profession and expansion of international enrollment), and the uplifting (and ensuring) the quality and usefulness of research (such as the establishment of Institutional Review Boards and Institutional Research centers).

Transformation of Taiwan HEIs - Within these few years, Taiwan HEIs has been undergoing various transformations. As with the fear of the lack of incoming students, talks of mergers and rumors of closure of some non-performing HEIs are quite alarming. Since 2000, two successful HEI mergers were accomplished. National Chiayi University (http://www.ncyu.edu.tw/) merges between National Chiayi Teachers College and National Chiayi Institute of Technology in 2000, combining the fields of education and science and technology. While, in 2008 Hualien University of Education merged into the National Dong Hwa University (http://www.ndhu.edu.tw/) and becomes the National Dong Hwa University Meilun Campus. It would seem a workable strategy which is to merge existing *national college of education* into the local national universities or combine two or more small colleges that are able to compliments each other's fields of specialization. As for the closure of HEIs, in 2014, 2 HEIs namely: Kao Fong College of Digital Contents and Yung Ta Institute of Technology and Commerce (http://www.ytit.edu.tw/) announced their closure due to the lack of incoming students.

According to several news reports, further plans and negotiations of HEIs mergers are also underway. Table 13 shows the various probable mergers. Although most of the talks are still in their early stages, voices of protest are already being heard from both alumni and students (Chou, 2016). Looking into the list of probable HEIs mergers, it would seem that most of the mergers are quite feasible, since with the similar in geographical location and with the difference in their field of expertise (course offerings). Hence, merger would seem a viable option to further streamline and make the institution more efficient and effective.

Table 13

HEIs undergoing plans and talks of mergers

	HEIs mergers
1.	National Tsing Hua University + National Hsinchu University of Education
2.	National Kaohsiung Marine University + National Kaohsiung First University of Science and Technology + National Kaohsiung University of Applied Sciences
3.	National Yang-Ming University + National Chiao Tung University
4.	National Taitung University + National Taitung Junior College
5.	National Cheng Kung University + Taiwan National University of the Arts
6.	National Taiwan University + National Taiwan Normal University + National Taiwan University of Science and Technology
7.	National Sun Yat-Sen University + National University of Kaohsiung
8.	National ChengChi University + National Taiwan University of Science and Technology

Among the most controversial transformation are between the 3 big HEIs in Taiwan; National Taiwan University + National Taiwan Normal University + National Taiwan University of Science and Technology. However, after much controversy and protest from their students, the 3 HEIs instead formed the NTU Triangle education system; an alliance that aims to promote teaching and research activities. In essence, students from the three institutions are able to select (cross-enroll) subjects within the system. Actually, since 2008 there have been several university systems already in place. Similar with the function of the NTU Triangle system, the main objective is to share resources between each of the member school (see Table 14).

Evolution of course offering - Besides the transformation of HEIs as a whole, course programs are also evolving. With the fear of having to close down due to lack of students, many undergraduate programs and colleges have been thinking of diversifying. An initial strategy is to enhance the ***use of technology*** in the form of *open courses*, such as: Open Course Ware of National Taiwan University (http://ocw.aca.ntu.edu.tw/), MOOCs of National Tsing Hua University (http://mooc.nthu.edu.tw/), and Tamkang University MOOCs (http://mooc.tku.edu.tw/). Students are also able to credit some course subjects after passing the certification examination (For more information, see http://apc.aca.ntu.edu.tw/). In this way, even Senior High School students are able to take advance university courses. Universities are able to apply special subsidy to provide incentives for faculty who are willing to participate in the project.

Table 14

University systems in Taiwan

Year	School system	Member HEIs
2008	University System of Taiwan (http://www.ust.edu.tw/)	National Tsing Hua University, National Chiao Tung University, National Central University, National Yang Ming University
2011	Taiwan Comprehensive University System (https://elitesports.tcus.edu.tw/)	National Cheng Kung University, National Sun Yat-Sen University, National Chung Hsing University, National Chung Cheng University
2011	University System of Taipei (http://ustp.tmu.edu.tw/)	Taipei Medical University, National Taipei University of Technology, National Taiwan Ocean University, National Taipei University
2011	Taiwan University of Education (http://www.tue.edu.tw/)	University of Taipei, National Taichung University of Education, National Pingtung University, National University of Tainan, National Chiayi University, National Taitung University, National Dong Hwa University
2012	Mid-Taiwan University System	Feng Chia University, Tunghai University, China Medical University, Asia University, Chung Shan Medical University, Providence University
2016	NTU Triangle (http://triangle.ntu.edu.tw/)	National Taiwan University, National Taiwan Normal University, National Taiwan University of Science and Technology

HEIs are also encouraged to expand its ***industry-university cooperation***, besides the consultation of industry experts to lessen the gap between school and the industry, internship are also provided for students, while cooperative research projects are also being undertaken (for more information, see https://www.iaci.nkfust.edu.tw/). Furthermore, HEIs are also encouraging their faculty to have lesser course teaching loads and participate in *hands-on industry training* or complete certain *industry certificates*, such as: Tourist guides (for tourism and foreign language faculty), IT Industry certificates (for technology related courses, e.g. Microsoft, Cisco), and many others. In effect, course contents are able to help better prepare students for future employment. A more unique variation of this strategy is the so called ***Customize Employment Credit Program*** (for more information http://www.lhu.edu.tw/web2/order_list/introduction.html), wherein the HEI and the industry shall decide on a list of course subject students should undertake and is followed by an internship opportunity. In this way, students are able to receive a *Certificate of Completion* for the said credit program and at the same time gain actual work experience, which might develop into future employment opportunity.

HEIs are also *transforming their course programs*; a more common is the inclusion of technology into the current curriculum designs, such as the College of Arts in the National Taiwan Normal University (for more details, see http://arts.ntnu.edu.tw/en/). Many other foreseeable changes are for the Liberal Arts and Humanities, such as History and Philosophy. In addition, horizontal expansions of course offering are also encouraged. Many foreign language departments are evolving into more diverse course offerings, such as the opening of additional language of concentration besides the more common English, Japanese, Korean, and Spanish, various Asian languages can also be included.

Many HEIs are also either transforming or opening up new ***degree programs***. Since, the MOE controls the maximum allowable number of students a university is able to enroll, further establishment of new departments are currently nearly impossible. Hence, what most HEIs will do is to accumulate all the excess or unused slots in

order to form a new class or program. For example: In a certain university, their Department of History accepts 35 new students each year, however, on average for the past 3 years, only 32 new students have enrolled, hence, the department can give up the 3 unused slots for other course program to use. To accomplish this, consultative meetings with the concern department heads and deans are undertaken. In addition, HEIs have a tendency of not hiring new tenured faculty and since most new degree programs are multi-disciplinary by nature, instead the faculty structure is derived from existing departments. For example: The Bachelor's Program in Educational Leadership and Technology Development of the Fu Jen Catholic University (for more details, see http://www.eltd.fju.edu.tw/), this degree program utilizes the already present expertise of the College of Education, which is educational leadership (from the Graduate Institute of Educational Leadership and Development) and information technology (from the department of Library and Information Science). Lastly, with the uncertainty of student enrollments, currently HEIs are also more inclined to hire *contractual* instead of tenured faculty. Hence, adds to the problem of future job security of doctoral graduates.

As for the ***expansion of international enrollments***, looking at the previous statistics of foreign student, although majority of them are from the Asian region, still the importance of the English taught programs are seen. To augment this need, many HEIs are providing additional incentives for faculty that are willing to open full English taught course subjects, while many HEIs are also opening up beside their existing international Master's program, additional full English course programs and even College of International Education are being conceived. Such as: the *College of International and Cross-Strait Education* of the Asia University (for more details, see http://ci3.asia.edu.tw/) and the *Brand and Fashion Management* of the Fu Jen Catholic University (for more details, see http://www.bfm.fju.edu.tw/). In addition, many HEIs are opening up *twinning programs* with international partners, while others have gained the advantages of joining with various organizations, such as the *University Mobility in Asia and the Pacific* (UMAP) and *Association of Christian Universities and Colleges in Asia* (ACUCA) for sectarian HEIs.

Ensuring quality and effective researches - Within past few years, the MOE have been concern on the various issues regarding the quality and effectiveness of researches. In effect, ***Institutional Review Boards*** (IRBs) or ***Research Ethics Committees*** (RECs) are established. The objective of these centers is to provide policies and regulations of research ethical issues of various disciplines, at the same time provide training workshops, and to conduct ethics review process. Initially IRBs and/or RECs have become mandatory for medical institutions; evaluations held on 2007 have showed much improvement in its implementations. Later on in 2015 Taiwan's IRBs have participated in the *Forum for Ethical Review Committees in the Asian and Western Pacific Region* (FERCAP) and the *Association for the Accreditation of Human Research Protection Programs* (AAHRPP). As for the field of social sciences, the MOE also started to organize IRBs/RECs within HEIs. In 2014, more than 10 centers were installed, while in 2016 the MOE approved 13 centers (see Table 15 for more details).

Table 15

List of Taiwan HEIs IRBs and RECs

Taiwan HEI Institutional Review Boards/Research Ethics Committee
1. National Taiwan University (http://ord.ntu.edu.tw/REC/)
2. China Medical University (http://61.66.117.10/2007/IRB/)
3. National Cheng Kung University (http://www.ncku.edu.tw/~nckuhirb/)
4. National Chiao Tung University (http://rec.nctu.edu.tw/)
5. National Tsing Hua University (http://rec.web.nthu.edu.tw/)
6. Fu Jen Catholic University (http://irb.rdo.fju.edu.tw/)
7. National Yang Ming University (http://ord.web.ym.edu.tw/files/90-1141-1.php)
8. National Changhua University of Education (http://rec.ncue.edu.tw/)
9. National Taiwan Normal University (http://www.acad.ntnu.edu.tw/)
10. National ChengChi University (http://rec.nccu.edu.tw/)
11. National Chung Cheng University (http://rec.ccu.edu.tw/)
12. University of Taipei (http://research1.utaipei.edu.tw/files/11-1004-1950.php)
13. Yuanpei University (http://hrec.ypu.edu.tw/)

In 2015, the MOE started to provide grants for the establishment of ***Institutional Research*** (IR) centers. Table 16 shows the list of HEIs with IRs. With the goal of providing a more scientific (or data driven) activities in support of institutional planning, policy development, and decision making, it is hoped that by doing so a more effective governance of HEIs is undertaken.

Table 16

List of Taiwan IR centers and amount of funding in 2015

	HEIs Institutional Research Centers	Funding[1]
1	Asia University	83.34
2	National Cheng Kung University	83.34
3	Hsuan Chuang University	83.34
4	National Chengchi University	83.34
5	National Tsing Hua University	83.34
6	National Sun Yat-Sen University	83.34
7	Feng Chia University	83.34
8	Soochow University	66.66
9	Tamkang University	66.66
10	National Normal University	66.66
11	National Taiwan Ocean University	66.66
12	Chung Yuan Christian University	66.66
13	Dayeh University	66.66
14	National Chiao Tung University	66.66
15	Shih Hsin University	66.66
16	Taipei Medical University	66.66
17	National University of Kaohsiung	50.00
18	Yuan Ze University	50.00
19	National Kaohsiung Normal University	50.00
20	National Taipei University of Education	50.00
21	National Taiwan University	50.00
22	National Taiwan Sport University	50.00
23	National Pingtung University	50.00
24	Chang Jung Christian University	50.00
25	National Chi Nan University	50.00
26	National Taitung University	50.00

Note. [1]Computed in thousands of USD using the exchange rate of 1 USD = 30 NTD.

4. Conclusion

With much having said about the current standing and strategies being implemented in Taiwan HEIs and together with the upcoming end of the two major funding schemes (PDTNU and PRTEU) in December 2016, the MOE released a new scheme on April 2015 and clarifications were made on January 2016 on the ***Higher Education Blueprint for the New Generation***. The blueprint's goals are: *Every school having its own uniqueness and hope for each individual*, international fame and give glory to Taiwan, and *innovation, implementation, merging, and transformation*. Hence, the MOE announced the implementation of 5 projects and encourage HEIs to apply, namely: *University with world-class excellence* for the aspiring to become world-class institutions, *technological innovation* for the university of science and technology, *learning innovation* for the teaching focused institutions, *professional focusing institutions* for the specific field specialists, and *regional innovation and integration* for the institutions who are willing to restructure and merge. Within these project applications, HEIs should focus on the vision of *every school having its own uniqueness and hope for each individual*, *international cooperation and local concern*, and *innovation, implementation, merging, and transformation*.

All in all, with much pressure from both global and local sources, Taiwan HEIs are currently in the point wherein an opportunity to evolve is in place. With regards to the *flagship university* in Taiwan, there is no doubt that *National Taiwan University* will be the first that would come into mind, because of its prestige within the

academe. In reality, the immediate concern for the top-tier HEIs in Taiwan would be maintaining its current status, since they are not that affected by the decreasing number of students, as compared to the private HEIs. In other words, top-tier national HEIs don't fear for the lack of students, since the first one to go shall be the private HEIs and other low performing national HEIs (from what is left in the not yet been merged/transform institutions). It would be practical to say that the private HEIs will have to close down first, before the national HEIs shall be affected. However, within this dire time, the goal is to become a flagship university in your own way. Start to look back and re-think of the ***core competitiveness*** of the institution, explore what is unique and develop this uniqueness within course offerings. In essence, blending a new brand of institution that is focused on one's unique competitive advantages.

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