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Unraveling issues behind ISI misconceptions: An empirical study on the practical effects of academic publication

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Abstract

Much concern on publications is seen in the academe for the past ten years. The notion of publish or perish has been troubling many faculties and scholars. More specifically, publishing in journals included in the Thomson Reuters' ISI Web of Science. Similarly in Taiwan, many are concerned with the actual effects such phenomenon. To better understand this issue, the current paper shall showcase the findings of an empirical study. A survey with regards to various publication implications are distributed randomly to 200 faculties and graduate students. A total of 95 valid returns were analyzed. Results indicate that the highest or the most important factor in the various academic setting and activities is the *Number of publications indexed in ISI* and the *Number of publications indexed in Taiwan Citation Indexes*. In sum, with ISI indexed journals playing a major role in academic key performance indicators, alternatives are being suggested and considered in order to make the evaluations more holistic and fair.

Keywords: academic publication; journal citation database; ISI; Science and non-Science; academic fields

Unraveling issues behind ISI misconceptions: An empirical study on the practical effects of academic publication

1. Introduction

In the academe of today, the definition of scholarship is said to be highly correlated to academic publications (Boyer, 1990; Dirks, 1998). University rankings, institutional funding, and even prestige in a certain field of study are all interconnected with the number of scholarly articles published and their subsequent citations by later articles (Anderson, Ronning, Vries, & Martinson, 2007; Keith, 1999). Furthermore, the recent widespread accessibility and interconnectivity brought forth by the availability of the internet, has also started the evolution of academic related technology (Chambers, 2004). Tools such as the Thomson Reuters' ISI Web of Science (WOS) website has also simplified scholars' access to published articles of interest (Braam, Moed, & Vanraan, 1991; Thelwall, Vaughan, Cothey, Li, & Smith, 2003).

In Taiwan, the rise in emphasis on publications indexed in the Thomson Reuters' ISI citation database was clearly observed (K. H. Chen & Chien, 2009; Chou & Ching, 2012; Chu, 2009; A. H. M. Huang, 2009; Kao & Pao, 2009; Thelwall et al., 2003). The concept of *publish or perish*, which signals the importance of publishing research results, has also affected Taiwan's academe. In effect, educators are pressured to publish in peer-reviewed journals, preferably those included in the ISI citation indexes, such as the Science Citation Index (SCI), Social Science Citation Index (SSCI), or the Arts and Humanities Citation Index (A&HCI). It has been noted that the number of publications indexed in the ISI citation database are quite important, since these numbers are used as basis for research grant approvals (Kao & Pao, 2009), university rankings (M. H. Huang, Chang, & Chen, 2006), and even tenureship or promotion of faculty (Tien, 2007).

Within the past ten years, evidence of increased publications in academic journals was clearly observed. Bibliometric data gathered from the Thomson Reuter's ISI WOS and the SCI Journal and Country Ranking Web sites suggest that both databases show similar trends, as there is an obvious increase in the number of publications but a decrease in the average number of citations per publication (Chou & Ching, 2012, p. 235; SCImago, 2007; Thomson Reuters, 2010). This phenomenon might be caused by the drastic need to publish in ISI indexed journals, however, fails to properly utilize such publications. Furthermore, there is in fact a growing sentiment from the Taiwan academe; a collective voice that calls for a change in the various evaluation practices that uses ISI as a criteria.

In light of these issues, the current chapter shall showcase an empirical study on the various perceived meaning, effects, and hard facts regarding ISI usage. Furthermore, this chapter shall focused on comparing the opinions from various demographic information, such as: teachers and students, Science and non-Science academic fields, typical university and science and technology based schools (including junior colleges), and public and private institutions. Ultimately, this chapter shall provide readers with a unique outlook on how faculty and students perceived the role of ISI in Taiwan academe.

2. Method

This empirical study utilizes a survey questionnaire designed by the author. Initial pilot testing was accomplished on 10 students and revisions were noted. Quantitative surveys are used to gather information at a particular point in time with the intention of describing the nature of existing conditions, or identifying standards against which existing conditions can be compared, or determining the relationships that exist between specific events (Cohen, Manion, & Morrison, 2007). Most survey will combine nominal data on participants' backgrounds and relevant personal details with other scales (Weisberg, Kronsnick, & Bowen, 1996). Surveys are often administered to a large number of respondents, hence, survey research are often coined to as quantitative

research, which has a high level of structure and low level of researcher involvement with the study population (Axinn & Pearce, 2006). Besides the nominal data, the survey questionnaire focuses on how well the participants understand the various bibliometric tools and database. Furthermore, participants are also asked to provide their perceived role of ISI in various academic settings and activities. Finally, participants are asked to rank their perceived importance on the various academic responsibilities (such as: teaching, research, counseling, and service).

This study also utilized an *online survey* to gathered insights from the faculty and students participants. Using the internet as a platform in conducting social science surveys is becoming more common. Although internet-based or online surveys have many features in common with paper-based surveys, it also has its own particular features (Cohen et al., 2007). Watt (1997) mentioned that some of the advantages of using an online survey are the reduced costs in encoding and processing data. In addition, it also reduces the time needed to distribute, gather, and process data. Online survey enables a wider and much larger population to be accessed, allowing researchers to reach difficult populations under the cover of anonymity and non-traceability (Dillman & Bowker, 2000).

2.1 Participants

An email invitation with the survey link was sent out to strategically sampled faculty and graduate students of various higher education institutions in northern part of Taiwan. Participants were selected using the stratified random sampling method. Stratified sampling involves dividing the population into homogeneous groups, wherein each group contains subjects with similar characteristics (Cohen et al., 2007). In addition, Stratified sampling is also a method of random sampling. In essence, in a stratified sample the sampling frame is divided into non-overlapping groups or strata, such as geographical locations, age-groups, genders. A total of 300 emails (150 faculty and 150 graduate students) were sent out on March 1, 2012. After 2 weeks, a total of 95 participants or a 32% responds rate are collected. For the internal consistency of the questionnaire the Lee Cronbach's (1951) coefficient alpha (Cronbach's alpha) was computed to be 0.88, which is quite good (Nunnally & Bemstein, 1994). A popular rule of thumb is the size should be generally greater than or equal to 0.70, which indicate an acceptable level of reliability, and those greater or equal to 0.80 demonstrate very good reliability for research purposes (Johnson & Christensen, 2008). Table 1 shows the various demography of the participants with a total of 44 faculty and 51 graduate students.

3. Results and discussions

The data gathered from the survey questionnaire are encoded and analyzed with the used of the software, Statistical Package for Social Scientist (SPSS) version 15. The results will be divided into various sections, such as: the perceived ISI roles in various academic settings and activities, hard facts regarding ISI importance, and the perceptions towards ISI in general.

3.1 Perceived ISI roles in various academic settings and activities

This section shows how participants perceived the role of ISI in various academic settings and activities. All of the participants are tasked to rank the top three (3) most important factors in various academic settings and activities, such as: overall Taiwan academe, and important for their current academic field. For faculties, such as: important for new faculty applicant, important for faculty promotion, important for in-school evaluation, and important for faculty National Science Council (NSC) research application. Data are tabulated with weights given to the rankings as follows: 3 for 1st choice, 2 for 2nd choice, and 1 for the 3rd choice.

Table 2 shows the participants' perceived most important factors in the current academe. The highest or the most important factor is *Number of publications indexed in SSCI/SCI/A&HCI (ISI)* with 254, followed by the *Number of publications indexed in Taiwan Citation Indexes* with 122, and the third is building up *Social capital (network of friends, etc.)* with 57. It is quite interesting to say that in all of the succeeding categories, the topmost

answer is dominated by the role of ISI.

Table 1

Participants' background demography (N=95)

Items	Gender		Total (*N*=95)
	Female (*n*=53)	Male (*n*=42)	
Teachers	**16**	**28**	**44**
Institution			
Public	2	18	**20**
University	0	7	7 (16%)
Science & Technology University	0	11	11 (25%)
Junior College	2	0	2 (4%)
Private	14	10	**24**
University	14	0	14 (32%)
Science & Technology University	0	6	6 (14%)
Junior College	0	4	4 (9%)
Rank			
Professor	0	7	7 (16%)
Associate Professor	6	0	6 (14%)
Assistant Professor	8	15	23 (52%)
Lecturer	2	6	8 (18%)
Contract			
Full-time	8	22	30 (68%)
Part-time	8	6	14 (32%)
Year graduate (PhD)			
Before 2000	6	13	19 (43%)
2000 and above	10	15	25 (57%)
Academic Field			
Science	6	10	16 (36%)
Non-Science	10	18	28 (64%)
Students	**37**	**14**	**51**
Institutions			
Public University	34	8	**42**
Masters	18	5	23 (45%)
Ph. D.	16	3	19 (37%)
Private University	3	6	**9**
Masters	3	6	9 (18%)
Academic Field			
Science	6	6	12 (24%)
Non-Science	31	8	39 (76%)

Table 2

Important in current Taiwan academe (N=95)

Items	Counts
Number of publications indexed in SSCI/SCI/A&HCI (ISI)	254
Number of publications indexed in Taiwan Citation Indexes	122
Social capital (network of friends, etc.)	57
Number of NSC research grants	48
Publications' impact factor	33
Publications' citation count	32
Overall number of publications (English/non-English)	10
Overall number of conferences attended (local/international)	6
Books	5
Number of industry cooperation projects	3

Note. Counts are weighted values with 3 for the 1st choice, 2 for the 2nd choice, and 1 for the 3rd choice.

Looking into the rest of tables 3 to 7, except for some minor differences in tables 6; besides *Number of publications indexed in SSCI/SCI/A&HCI (ISI)* as the 1st choice, the remaining top choices are dominated by the following: *Number of publications indexed in Taiwan Citation Indexes*, *Social capital (network of friends, etc.)*, *Number of NSC research grants*, and *Publications' impact factor*. It is sad to say that although the item *Social capital (network of friends, etc.)* scores is not high as compared with the 1st and 2nd choices, it still quite dominant with the various academic settings and activities. Even on later comparative analysis on the various background demographics of the participants, results still shows that *Social capital (network of friends, etc.)* played a major part in the activities.

Other factors such as the *Number of NSC research grants* and *Publications' impact factor* are also two relevant factors in various academic settings and activities. The Taiwan NSC is one of the most competitive researches granting institution in Taiwan. Each year around 30,000 scholars would submit research proposal with a acceptance rate of around 44% (52% for faculty in public institutions and 35% for faculty in private institutions) (NSC, 2012). However, looking into table 7; the change of having NSC research grants is also mostly dependent on the *Number of publications indexed in ISI and Taiwan Citation Indexes*. Therefore, it seems that all of the academic settings and activities are inter-related into one vicious cycle.

Table 3

Important in your current academic field (N=95)

Items	Counts
Number of publications indexed in SSCI/SCI/A&HCI (ISI)	223
Number of publications indexed in Taiwan Citation Indexes	137
Social capital (network of friends, etc.)	58
Number of NSC research grants	56
Publications' impact factor	30

Note. Counts are weighted values with 3 for the 1st choice, 2 for the 2nd choice, and 1 for the 3rd choice.

Table 4

Important for new faculty applicants (n=44)

Items	Counts
Number of publications indexed in SSCI/SCI/A&HCI (ISI)	115
Social capital (network of friends, etc.)	39
Number of publications indexed in Taiwan Citation Indexes	34
Publications' impact factor	32
Number of NSC research grants	18

Note. Counts are weighted values with 3 for the 1st choice, 2 for the 2nd choice, and 1 for the 3rd choice.

Results also show the importance of the *Number of publications indexed in Taiwan Citation Indexes* as one of the major factor in the various academic settings and activities. It is later mentioned that publishing in *journals included in the Taiwan citation indexes are sometimes far stringent (strict/harder) than submitting to ISI journals* (Mean = 3.38) (please see table 12 for more details). The conception of the Taiwan citation indexes started in 1999, wherein the National Science Council (NSC) established two project based research centers: the Social Science Research Centre (SSRC) and the Centre for Humanities Research (HRC). The main tasks of the two centers are to produce the Taiwan Social Science Citation Index (TSSCI) and the Taiwan Humanities

Citation Index (THCI) (Kuang Hua Chen, 2004). To date there are a total of 93 journals indexed in the TSSCI (TSSCI, 2011), while THCI have a total of 343 journals indexed (THCI, 2012). Ultimately, increasing number of journals indexed in Taiwan citation database could be an auxiliary citation index for local researchers to gain an overall picture of Taiwanese research (Kuang Hua Chen, 2004).

Table 5

Important for faculty promotion (n=44)

Items	Counts
Number of publications indexed in SSCI/SCI/A&HCI (ISI)	120
Number of publications indexed in Taiwan Citation Indexes	62
Publications' impact factor	26
Number of NSC research grants	19
Books	11

Note. Counts are weighted values with 3 for the 1st choice, 2 for the 2nd choice, and 1 for the 3rd choice.

Table 6

Important for in-school faculty evaluation (n=44)

Items	Counts
Number of publications indexed in SSCI/SCI/A&HCI (ISI)	78
Number of patents	45
Number of publications indexed in Taiwan Citation Indexes	30
Number of industry cooperation projects	30
Number of NSC research grants	27

Note. Counts are weighted values with 3 for the 1st choice, 2 for the 2nd choice, and 1 for the 3rd choice.

For the factors regarding faculty promotion and in-school evaluation, table 5 and 6 shows that besides the previously discussed factors, additional issues such as *Publications' impact factor*, *Books*, *Number of patents*, and *Number of industry cooperation projects*; are some other relevant items that are being considered. As for NSC research applications, table 7 shows the additional factor of *Publications' citation count*. It is noted that the impact factor of an article is still based on the ISI database. Since, Thomson Reuters are the one computing and cataloging the citation reports.

As for the citation count, the recent expansion of the *google scholar* function of tracking publication citation counts has further made this information readily available to the public. Furthermore, it is said that *google scholar* includes all other citation databases in their computation of *h-index*; a mathematical way of quantifying and characterizing the scientific output of a researcher (Hirsch, 2005). Since, a citation count means that another article has cited your work. This would mean that the work has contributed (affected/is of interest) to another study. In essence, although *Publications' citation count* scores is quite low, it can be said that citation counts is a far more transparent and general way of quantifying relevant publications.

3.2 Hard facts regarding ISI importance

This section shall try to clear up various hard facts regarding ISI importance through comparing the opinions from various demographic information, such as: teachers and students, Science and non-Science academic fields, typical university and science and technology based schools (including junior colleges), and public and private

institutions. It is said that the importance of ISI publications differs in various academic setting. The most common issue is the difference between academic fields, more specifically the Science and non-Science domain; Science meaning the fields of Science, Technology, Engineering, and Mathematics or STEM. It is noted that Science or STEM academic fields have more opportunity to publish in ISI journals than non-Science or Social Sciences. With the nature of the language used in Science fields already in English as compare to non-Sciences, who are mostly in the local language. Hence, it is said that standard on academic settings and activities should also be different.

Table 7

Important for faculty National Science Council research grant application (n=44)

Items	Counts
Number of publications indexed in SSCI/SCI/A&HCI (ISI)	126
Number of publications indexed in Taiwan Citation Indexes	70
Publications' impact factor	16
Number of NSC research grants	13
Publications' citation count	12

Note. Counts are weighted values with 3 for the 1st choice, 2 for the 2nd choice, and 1 for the 3rd choice.

Table 8 and 9 shows the comparison between the choices of teachers and students, and between the Science and non-Science participants. Data are cross-tabulated by means of the various background demographics and rankings (or selections) weighted as follows: 3 for 1st choice, 2 for 2nd choice, and 1 for the 3rd choice. As seen with the previous results, the factors *Number of publications indexed in SSCI/SCI/A&HCI (ISI)* and *Number of publications indexed in Taiwan Citation Indexes* ranks the 1st and 2nd choices among the teachers and students, and also among the Science and non-Science participants. Besides the slight differences between the third choices of Science and non-Science participants, the majority of the results show that there are no apparent differences between any specific academic field and the Taiwan academe in particular.

Table 8

Comparison of teacher and student (N=95)

Group	Items	Counts
	Important in current Taiwan academe	
Teacher (*n*=44)	Number of publications indexed in SSCI/SCI/A&HCI (ISI)	115
	Number of publications indexed in Taiwan Citation Indexes	40
	Social capital (network of friends, etc.)	33
Student (*n*=51)	Number of publications indexed in SSCI/SCI/A&HCI (ISI)	139
	Number of publications indexed in Taiwan Citation Indexes	82
	Publications' citation count	24
	Important in your current academic field	
Teacher (*n*=44)	Number of publications indexed in SSCI/SCI/A&HCI (ISI)	88
	Number of publications indexed in Taiwan Citation Indexes	48
	Social capital (network of friends, etc.)	39
Student (*n*=51)	Number of publications indexed in SSCI/SCI/A&HCI (ISI)	135
	Number of publications indexed in Taiwan Citation Indexes	89
	Social capital (network of friends, etc.)	19

Note. Counts are weighted values with 3 for the 1st choice, 2 for the 2nd choice, and 1 for the 3rd choice.

Table 9

Comparison of science and non-science academic fields (N=95)

Group	Items	Counts
	Important in current Taiwan academe	
Science (*n*=28)	Number of publications indexed in SSCI/SCI/A&HCI (ISI)	69
	Number of publications indexed in Taiwan Citation Indexes	39
	Publications' impact factor	16
Non-Science (*n*=67)	Number of publications indexed in SSCI/SCI/A&HCI (ISI)	185
	Number of publications indexed in Taiwan Citation Indexes	83
	Social capital (network of friends, etc.)	48
	Important in your current academic field	
Science (*n*=28)	Number of publications indexed in SSCI/SCI/A&HCI (ISI)	66
	Number of publications indexed in Taiwan Citation Indexes	48
	Number of NSC research grants	13
Non-Science (*n*=67)	Number of publications indexed in SSCI/SCI/A&HCI (ISI)	157
	Number of publications indexed in Taiwan Citation Indexes	89
	Number of NSC research grants	53

Note. Counts are weighted values with 3 for the 1st choice, 2 for the 2nd choice, and 1 for the 3rd choice.

Another common notion is that there should be some difference among the various types of higher education institutions, such as typical universities (closely categorized as research institutions) and science and technology universities (S&T) (including junior colleges, are mostly categorized as vocational institutions concentrated on knowledge application). Furthermore, as the majority of S&T institutions are privately owned (around the ratio of 1 private institution to 3 private institutions) (MOE, 2006, 2012). With the difference in the nature of the institutions, therefore it is commonly perceived that research universities places more emphasis on ISI publications.

Table 10 and 11 shows the results of the comparison between the different types of higher education institutions. Besides the minor discrepancy between perceived Taiwan academe and academic field of the participants within the private institutions, the rest of the choices still show no particular differences between the academic fields and Taiwan academe in general. In essence, this section shows the hard facts regarding the role and importance of ISI publications across Taiwan academe.

Table 10

Comparison of university and science & technology (colleges) (N=95)

Group	Items	Counts
	Important in current Taiwan academe	
University (*n*=72)	Number of publications indexed in SSCI/SCI/A&HCI (ISI)	202
	Number of publications indexed in Taiwan Citation Indexes	104
	Number of NSC research grants	37
Science & Technology/ Colleges (*n*=23)	Number of publications indexed in SSCI/SCI/A&HCI (ISI)	52
	Social capital (network of friends, etc.)	33
	Number of publications indexed in Taiwan Citation Indexes	18
	Important in your current academic field	
University (*n*=72)	Number of publications indexed in SSCI/SCI/A&HCI (ISI)	177
	Number of publications indexed in Taiwan Citation Indexes	119
	Number of NSC research grants	45
Science & Technology/ Colleges (*n*=23)	Number of publications indexed in SSCI/SCI/A&HCI (ISI)	46
	Social capital (network of friends, etc.)	39
	Number of publications indexed in Taiwan Citation Indexes	18

Note. Counts are weighted values with 3 for the 1st choice, 2 for the 2nd choice, and 1 for the 3rd choice.

Table 11

Comparison of public and private institutions (N=95)

Group	Items	Counts
	Important in current Taiwan academe	
Public (*n*=62)	Number of publications indexed in SSCI/SCI/A&HCI (ISI)	161
	Number of publications indexed in Taiwan Citation Indexes	84
	Social capital (network of friends, etc.)	57
Private (*n*=33)	Number of publications indexed in SSCI/SCI/A&HCI (ISI)	93
	Number of publications indexed in Taiwan Citation Indexes	38
	Publications' impact factor	30
	Important in your current academic field	
Public (*n*=62)	Number of publications indexed in SSCI/SCI/A&HCI (ISI)	130
	Number of publications indexed in Taiwan Citation Indexes	85
	Social capital (network of friends, etc.)	58
Private (*n*=33)	Number of publications indexed in SSCI/SCI/A&HCI (ISI)	93
	Number of publications indexed in Taiwan Citation Indexes	52
	Number of NSC research grants	33

Note. Counts are weighted values with 3 for the 1st choice, 2 for the 2nd choice, and 1 for the 3rd choice.

3.3 Perceptions towards ISI in general

Within this section, participants are asked regarding their perceptions towards ISI in general. Data are gathered, encoded, and analyzed. Table 12 shows the participants response regarding ISI usage. Results show that all of the participants acknowledged that ISI is used for *checking relevant literatures*. As the core objective of ISI citation database, which is to provide access to current and retrospective multidisciplinary information from high impact research journals in the world (Thomson Reuters, 2012a); ISI has truly achieved its purpose.

Another relevant usage of ISI is the *checking of journal performance or impact factor*. Journal impact factor (IF) is a score given by Thomson Reuters' Journal Citation Reports (JCR); which provides quantitative tools for ranking, evaluating, categorizing, and comparing journals (Thomson Reuters, 2012b). The impact factor is said to be the measure of the frequency with which the *average article* in a journal has been cited in a particular year or period. The annual JCR impact factor is a ratio between citations and recent citable items published. The impact factor of a journal is calculated by dividing the number of current year citations to the source items published in that journal during the previous two years (Thomson Reuters, 2012b). Hence, looking into a journal's IF would account for the journals' relevancy in that certain academic domain.

Table 12

ISI usage (N=95)

Items	*n*	%
Check relevant literatures	95	100%
Journal performance (impact factor)	63	66%
Authors' publication count	45	47%
Articles' citation count	44	46%
Authors' citation count	43	45%
Authors' impact factor	30	32%
Institutional performance	24	25%
Departmental performance	18	19%
Country performance	15	16%

Table 13

Familiarity with citation indexes and other bibliometric tools (N=95)

Items	*Mean*	*SD*	*n*	Usage %
Arts and Humanities Citation Index (A&HCI)	1.79	1.01	13	14%
Book Citation Index (BkCI)	1.65	1.04	9	9%
Chinese Science Citation Database (CSCD)	1.75	1.08	9	9%
Conference Proceeding Citation Index (CPCI)	1.84	1.08	15	16%
Engineering Index (EI)	1.85	1.02	36	38%
Google scholar	**3.27**	**0.84**	**87**	**92%**
MS Academic	2.14	1.10	51	54%
Proquest	2.53	0.93	62	65%
PubMed	1.75	0.94	26	27%
Science Citation Index (SCI)	**3.21**	**0.78**	**67**	**71%**
Scopus	2.46	1.13	47	49%
Social Science Citation Index (SSCI)	**3.33**	**0.82**	**67**	**71%**
Taiwan Humanities Citation Index (THCI)	2.05	1.18	23	24%
Taiwan Social Science Citation Index (TSSCI)	**3.32**	**0.73**	**66**	**69%**
Procedia	2.21	1.20	44	46%
Open Access	2.05	1.16	37	39%

Results in table 12 also show that almost half of the participants are quite technically knowledgeable about the usage of ISI. Besides the two top usages of *checking relevant literatures* and *checking Journal performance (impact factor)*, most participants also selected *checking for articles' citation count* (45%), *checking authors' citation count* (46%), and *checking authors' publication count* (47%). Such results imply that participants are using ISI to do research work.

Besides ISI usages, participants are also asked how much they understand the various bibliometric tools and their actual usage experiences. Table 13 shows that around 97% of the participants still depend on *google scholar* to search for related literature. Since, *google scholar* coverage is far more comprehensive (and inclusive) than that of any standalone bibliometric database. More importantly, *google scholar* is freely available to the public, as compared to other fee based database. Besides *google scholar*, participants have a fairly good idea and are actively using both *SSCI* and *SCI* database. Similarly, the local *TSSCI* also contributes to the overall research community.

Other bibliometric tools that are not so popular are the *Book Citation Index* (BkCI); a fairly new database established by Thomson Reuter in 2011 to record scholarly books, *Chinese Science Citation Database* (CSCD); a non-English Thomson Reuter database partnered with the Chinese Academy of Science created specifically for Mainland Chinese scholars, *Conference Proceeding Citation Index* (CPCI); a new database established by Thomson Reuter to keep track of conference proceedings, *Engineering Index* (EI); a database exclusively for engineering fields of study owned by Elsevier, *Scopus*; another Elsevier database which keep track of multidisciplinary bibliometric information (Scopus is said to have a much more coverage than the ISI database), and *Procedia*; another Elsevier database which keep track of conference proceedings.

One prominent new concept which is currently gaining ground is *Open Access* (OA). OA is a publication model which is said to provide the means to maximize the visibility, and thus the uptake and use, of research

outputs (OASIS, 2012). OA is fairly new, however can be defined as the immediate, online, free availability of research outputs without the severe restrictions on use commonly imposed by publisher copyright agreements (OASIS, 2012). Furthermore, in order to keep track of OA publications, an independent organization established the *Directory of Open Access Journals* (DOAJ). The aim of the DOAJ is to increase the visibility and ease of use of open access scientific and scholarly journals thereby promoting their increased usage and impact. The directory aims to be comprehensive and cover all open access scientific and scholarly journals that use a quality control system to guarantee the content (DOAJ, 2012). In essence, OA removes the financial restriction of readers and provide immediate free access publication. However, the question of how much an author would spend for the financial expenses, such as the computer infrastructure requirement for keeping an online copy of the publications and other administrative expenses are still quite debatable and questionable.

Table 14

Participants' perception towards ISI in general (N=95)

Items	*Mean*	*SD*
Personal		
Publishing in English is a challenge	**3.85**	1.18
ISI is only a tool that assists researchers	3.74	0.67
Teaching is more important than doing research	3.72	1.06
Taiwan indexed journals are more stringent (strict) than ISI	3.38	1.03
It is more prestigious to published in ISI than non-ISI journals	3.31	0.96
I have confidence in my English language ability	2.87	1.07
I have Taiwan citation (TSSCI/THCI) indexed publications	2.53	1.66
I have ISI indexed publications	2.07	1.57
Publication language		
English is the Global Academic Language	**4.22**	1.00
In order to keep pace with the world, publishing in English is inevitable	3.71	1.05
Non-English first language scholars are not suited to use English as a medium of publication (publishing in local language should be encourage)	3.09	1.29
Influence		
ISI influence the academic fields' research direction (research topics)	**3.64**	1.07
ISI signifies internationalization	3.59	0.93
ISI influence personal research direction (research topics)	3.55	0.88
Having ISI publications is highly related to personal career development	3.54	0.92
ISI signifies stringent (strict) article review procedure	3.46	0.92
Having ISI publications signifies personal research excellence	3.36	0.91
Quality		
Number of ISI publications signifies institutional (departmental) excellence	**3.60**	1.27
ISI signifies article (publication) quality	3.56	0.90
ISI signifies journal quality	3.49	0.93
Number of ISI publications can increased institutional (departmental) enrollees	2.49	0.77
Evaluation		
Current ISI dependent evaluation (institutional/department/promotion/grant application) policy is not reasonable	**3.73**	1.18
Citation counts (times cited) should be more important than ISI publication counts	3.61	0.84
It is unreasonable to placed additional weights (points) on ISI publications during evaluation (institutional/department/promotion/grant application)	2.82	1.06
Journal charges		
After paying the journal charges (submission fee), I expect my article (paper) to be published	**3.00**	1.04
Open Access business model is reasonable (Authors pay journal charges, so readers can freely download articles)	2.99	1.01
It is reasonable for ISI journals to ask authors to pay journal charges	2.84	0.97

Table 14 shows the participants' perception towards ISI. Results are separated into six areas, namely: *personal opinion towards ISI, medium of publication language, influence of ISI, ISI and publication quality, ISI and faculty evaluation exercises,* and *ISI and journal charges*. Participants are asked to rank their level of agreement in a five point Likert scale with 1 as strongly disagree, 2 disagree, 3 as neither agree or disagree, 4 agree, and 5 strongly agrees. Although, results indicate that *publishing in English is a challenge* (Mean = 3.85), participants rank the highest regarding the notion that *English is a global language* (Mean = 4.22) and *publishing in English is inevitable* (Mean = 3.71). However, some scholars believe that it is *inappropriate for non-English first speakers to write and publish in English* (Mean = 3.09).

With regards to the influence of ISI publications, besides the mentioned importance in the previous sections regarding the various academic settings and activities, ISI is said to *affect the academic fields' research directions* (Mean = 3.64) and *personal research directions* (Mean = 3.55). With regards to the concept of academic evaluation, most participants commented that the *current evaluation policy is unreasonable* (Mean = 3.73). Overall, such results indicate that the effect of ISI is already deeply rooted in the entire Taiwan academe and its effects have caused both positive and negative implications.

Table 15 shows the participants' reaction towards journal charges. Results show that most participants around 60% perceived that it is *reasonable for ISI indexed journals to collect article referee (review) fee* and around 51% perceived that it is *reasonable for non-ISI indexed journals to collect article referee fee*. Although most participants perceived that publications are supposed to *free* in *ISI* (43%) and *non-ISI including OA* (43%), many still accepts the notion of spending money on getting published. However, looking back at the result in table 14, some authors do expect that when they spend money on publications, their paper should be published no matter what.

Table 15

Participants' reaction towards journal charges (N=95)

Items	*n*	%
It is reasonable for ISI indexed journals to collect article publication fee	13	14%
It is reasonable for ISI indexed journals to collect article submission fee	18	19%
It is reasonable for ISI indexed journals to collect article referee (review) fee	57	60%
Publications in ISI indexed journals are supposed to be free	41	43%
It is reasonable for non-ISI indexed journals to collect article publication fee	28	29%
It is reasonable for non-ISI indexed journals to collect article submission fee	12	13%
It is reasonable for non-ISI indexed journals to collect article referee fee	48	51%
Publications are supposed to be free	41	43%

4. Conclusions

The primary objective of this paper is to showcase an empirical study on the various perceived meaning, effects, and hard facts regarding ISI usage in Taiwan. Furthermore, this study focused on comparing the opinions from various demographic information, such as: teachers and students, Science and non-Science academic fields, typical university and science and technology based schools (including junior colleges), and public and private institutions. Using the quantitative survey method, a researcher made survey with 95 respondents is collected and analyzed. Although the resulting sample size is not huge and account only for scholars in the northern part of Taiwan, the results can be used as a starting point for further studies.

Results of the survey indicate that the highest or the most important factor in the various academic setting

and activities is the *Number of publications indexed in ISI* and the *Number of publications indexed in Taiwan Citation Indexes.* While, ISI still dominates the majority of the academic settings and activities. However, with the current increasing number and increased emphasis of journals indexed in Taiwan citation database, local researchers could have an alternative based on publishing in the local language. Furthermore, journals indexed in Taiwan citation database is considered to be of good quality and the review process sometimes more rigorous than the ISIs. To sum up, with the effect of ISI already deeply rooted in the entire Taiwan academe and its effects have caused both positive and negative implications. An added finding is the role *google scholar* and *open access* journals which is of great potential in striking a balance with the ISI dominance.

NOTE: An updated version of this paper is adapted in a book chapter publish by *Sense Publishing* and shall be made available on the last quarter of 2013.

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