Proposing Researcher Brand Equity Index in Hospitality and Tourism

Abstract

Purpose: This study proposes a holistic model to rank and evaluate researchers' performance. This holistic model is developed by focusing on brand equity, which includes three components: perceived quality, brand image, and brand loyalty.

Design/methodology/approach: To show how the model works, two pseudo cases are presented.

Findings: This model encourages researchers to conduct more interdisciplinary research and collaborate with researchers from diverse backgrounds. The model allows researchers to strengthen their brand equity score or performance, since it includes publication attributes identified by researchers in the publication processes.

Practical Implications: The model is applicable not only to the fields of hospitality and tourism but also other to disciplines.

Originality/Value: As one of the first study in the field, this research introduces a holistic model to rank and evaluate researchers' performance.

Keywords: individual ranking, performance evaluation, brand equity, tourism, hospitality

INTRODUCTION

The main purpose of this study is to propose a holistic individual ranking model in hospitality and tourism research called the Researcher's Brand Equity Index. Ranking of researchers has always been an interesting field of inquiry for researchers and institutions since it helps them to evaluate their position within academic communities. There are a number of studies ranking authors or researchers in various disciplines (Bouyssou & Marchant, 2016; Li, Wang, Zhang, Lei, Ma, & Chen, 2014; Marchant, 2009; Zhou, Orshanskiy, Zha, & Giles, 2007). As shown in the journal ranking literature (Koseoglu, 2018), research on ranking individuals has generated its own literature and academic community due to the importance of individual rankings on researchers' performance appraisals and headhunting for institutions, government agencies, and publishers. These studies have focused on developing new ranking models, experimenting with these models in different disciplines, or discussing the usefulness of these models (Law, 2017; Rickman & Winters, 2016; Yang, Hong, Yin, & Davison, 2015).

The existing ranking models have two main constructs. They are research quantity and research quality (Dev, Parsa, Parsa, & Bujisic, 2015). Research quantity is an objective measure that includes the counting of publications based on the contribution of an author. In multi-authored publications, this contribution has been identified as the number of publications or fractional scores (Furrer, Thomas, & Goussevskaia, 2008; Koseoglu, Yildiz, & Ciftci, 2018). Research quality is a less objective measure than research quantity, yet it is still used to rank and evaluate researchers. To measure research quality, the number of citations and/or indexes derived from citations has been used in individual rankings. However, these models neglect to measure an author's contribution based on structure of collaboration, type of contribution, methodology, and funding for the work. Additionally, they do not provide a holistic perspective for the ranking

and performance appraisal of researchers. To meet this need for a holistic ranking, this study

proposes a new approach called the Researcher's Brand Equity Index (RBEI), which borrows the

term "brand equity" from the field of business and management. The main logic behind this is

that all researchers generate their own brand, which impacts both their career path and the

position of the institutions where they have worked. Therefore, measurement of the brand equity

(Aaker, 1996) of a researcher may help develop a holistic individual ranking model that can be

beneficial for researchers and institutions. The following section provides an overview of the

current approaches to individual rankings. The next section explains the proposed model using

the RBEI approach. The operationalization of the model is then presented and discussed. Finally,

conclusions and suggestions for future studies are provided.

LITERATURE REVIEW

Overview of Individual Ranking Models

Researchers and institutions have developed models to rank and evaluate the performance

of individuals by considering mainly publication numbers or contribution level (quantity) of

researchers, the quality of published articles, or a combination of these two perspectives.

Therefore, three approaches—quantity-based models, quality-based models, and hybrid

models—emerge in the literature and in practice (Dev et al., 2015; Law, 2017).

Quantity-based models: The main metric in these models is publication count. There are

two types of quantity-based models to rank researchers in the literature. The first model is based

on publication numbers, or researchers' appearance in a given period (Law, 2017). The second is

based on scores calculated by authorship order (Furrer et al., 2008). The quantity-based models

are simple and commonly used in individual rankings (Law, 2017) or performance appraisals of

faculty's research performance. These methods may be objective, but they do not illustrate a

clear picture of the influence and impact researchers generate in the literature and/or academic communities. Based on the present study's authors' experience, these quantity-based methods are used by many institutions to evaluate faculty's research performance. However, in the practice of performance appraisal of researchers, formal guidelines established by an institution can improve objectivity. If institutions do not provide formal guidelines for this process, the subjectivity increases, and the methods become questionable. This may influence levels of satisfaction among researchers. Regardless, these quantify-based methods ignore how researchers are influential and create an impact, and are therefore not holistic in their approach.

Quality-based models: In the individual ranking literature or performance appraisal of researchers, the determination of the quality of a publication is unclear. A publication's impact, often used to measure quality, is determined mainly by two indicators: citations numbers (Adkins & Budd, 2006) and/or journal impact factors (Amin & Mabe, 2000). However, these two indicators are not robust enough to determine the quality of publications since they are subject to bias (Law & Chon 2007). By considering Law's (2017) comments on the uselessness of individual ranking models, the present study offers that the quality of a publication should be gauged with three main indicators: authorship structure, methodological process, and impact of publication.

Authorship structure is related to the group of authors themselves, since international collaboration in the publication (Van Raan, 1998), disciplinary diversity of authors (Barjak & Robinson, 2008), and gender of authors (Nunkoo, Hall, & Ladsawut, 2017) are highly influential on the quality of output. Methodological process addresses what procedure or methods are applied in the study, since each method (experimental, conceptual studies, mixed methods, traditional qualitative or quantitative, case studies, and review studies) requires different efforts

to accomplish (Law, 2017). Impact of publication represents the quality of publishing based on impact-factor metrics. Impact factors are measured primarily by the number times a work has been cited. There are many approaches to calculate the number of citations as impact factors of publishing. For example, Journal Citation Report and Scopus Journal Metrics are commonly used.

Hybrid models: As shown in Figure 1, researchers have developed models to eliminate bias in the quantity-based and quality-based models. They include both quantity—number of publications—and quality metrics—H-index (Hirsch, 2005), G-index (Egghe, 2006), M-Quotient (Thompson, Callen, & Nahatta, 2006), EM-index (Bihari & Tripathi, 2017)—or some variations of these metrics (Btista, Campitelli, Konouchi, & Martinex, 2006; Harzing & van der Wal, 2008). These indexes are based on publication numbers and citations. Additionally, authorship network metrics are used to rank individuals. These metrics show the contributions and relationships of researchers within a given publication (Law, 2017). In practice, institutions commonly use both quantity- and quality-based approaches, along with peer reviews.

Insert Figure 1 about here

In the literature, there are several studies (Park, Phillips, Canter, & Abbott, 2011; Rutherford & Samenfink, 1992; Ryan, 2005; Samenfink & Rutherford, 2002; Ye, Li, & Law, 2013; Zhang 2015; Zhang, Lan, Qi, & Wu, 2017; Zhao & Ritchie, 2007) that rank researchers in the fields of hospitality and tourism. These studies use the same indicators considered in previous studies conducted in other disciplines or fields. Recently, Dev et al. (2015) introduced a model to assess faculty productivity. They considered four indicators: number of citations as

quality of research output, number of publications as quantity of research output, citations per

publication as consistency of quality research output, and citations per publication per year over

an extended period as longevity of quality research. This model works as an aggregate of the

average of ranking for these four indicators. Although Dev et al. (2015) stated that the model is

easy, effective, and adaptable and that objectivity was maintained during its application, Law

(2017) stated that "a major drawback of this assessment method is that although a scholar has left

academia, the articles authored by this scholar will continue to receive citations, thereby leading

to inaccurate results when comparisons are made with currently active scholars" (p. 393).

All of these methods are indeed complementary, rather than alternatives to rank or

evaluate the performance of individuals. However, they can produce questionable results because

they lack subjectivity, are not holistic, are discipline specific, and ignore the longevity of an

individual's research life (Dev et al. 2015; Law, 2017). Therefore, the main goal of this present

article is not to compare the advantages and disadvantages of the existing models but rather to

introduce a holistic model minimizing subjectivity and discipline specifics and considering the

longevity of individuals' research life. As researchers create their own brand, the main question

is how to measure the value of this brand. Addressing this question may help us to develop a

holistic individual ranking model by increasing objectivity. This effort relies on the concept of

brand equity as a marketing term, which is used to measure a brand's value in the market (Aaker,

1996).

Brand Equity

Brand equity is "a set of brand assets and liabilities linked to a brand, its name, and symbol,

which add to or subtract from the value provided by a product or service to a firm and/or to that

firm's customers" (Aaker, 1991, p. 15). Several different perspectives exist to measure brand

equity. For example, Aaker (1991) considered four components including brand loyalty, brand awareness, brand association, and perceived quality. Keller (1993) used brand awareness and brand image as components of brand knowledge, which is accepted as brand equity. Lassar et al. (1995) highlighted five components of brand equity: performance, social image, value, attachment, and trustworthiness. Kim, Kim, and An (2003) addressed brand equity with brand loyalty, brand awareness, perceived quality, and brand image. As shown in the literature, there is not a consensus of how to measure brand equity. Therefore, for the present study, the brand equity of a researcher may be measured with perceived quality, brand image, and brand loyalty since the other components—brand association and brand awareness—are implicitly considered in brand perceived quality and brand loyalty, respectively (Chahal & Bala, 2012). Each of these components is discussed in more detail in the following section.

METHODOLOGY

Proposed Researcher's Brand Equity Index

This study proposes a new model to rank and evaluate individual's research performance. This is a holistic model that can increase objectivity in the ranking and performance appraisal by extending metrics. This model is called Researcher's Brand Equity Index (RBEI). The proposed RBEI model includes four components, including perceived quality, brand loyalty, brand image, and longevity of individuals' research life. Perceived quality is related to a customer's overall perception of the quality of a product or services (Chahal & Bala, 2012). In the RBEI model it is defined as publication attributes (PA), including authorship structure, methodology, and impact of publication. Brand loyalty refers to the willingness of a customer to re-buy products and services (Chahal & Bala, 2012). In this model it is accepted as the number of times a publication has been cited (CNpP) of a researcher, since this number may indicate how widely accepted the

studies of this researcher are. Brand image is defined as "the consumers' perception of a brand as reflected by the brand associations held in their memory" (Chahal & Bala, 2012, p. 347). To measure this component, the RBEI model considers the number of the researcher's official connections. In other words, the number of co-authors (CoN) of a researcher is considered their brand image, since the collaboration number may generate greater interaction as image among collaborators and readers of researchers' studies. Longevity of an individual's research life (LR) is calculated as the difference between the time of a researcher's first publication and the present (or otherwise determined end point). The RBEI can be decomposed as follows:

$$RBEI = \frac{CNpP * CoN * PA}{LR}$$

where CNpP is the researcher's brand loyalty, CoN is the researcher's image, PA is perceived quality of a researcher's publications, and LR is the longevity of an individual's research life.

To show how the model works, a pseudo-case method is used because researchers' information in databases such as ORCID, SCOPUS, Google Scholar Analytics, Web of Science, and others is limited. Using the information from these databases may skew the results.

Operationalizing RBEI

To first implement the model, institutions or researchers should decide which publications they will include. While one way is to include all publications, institutions or researchers may want to limit the publications based on the goal of ranking and/or evaluation. For example, while refereed articles may be chosen, books, conference papers, and book chapters might not be included in the model. After deciding this, the model can be constructed with the following components.

Longevity of individuals' research life (LR)

LR is the difference between the time of a researcher's first publication among the selected

publications and the current time (otherwise determined end point). RBEI can be calculated as

per day, month, or year.

Citation Number per Publication of a Researcher (CNpP) as the researcher's brand loyalty

The model obtains *CNpP* by dividing the total number of citations for the selected publications

of the researcher by total publication numbers. To increase the objectivity and to standardize

ranking or evaluation, institutions or researchers should select one database (e.g., ORCID,

SCOPUS, Google Scholar Analytics, Mendeley, Web of Science) to obtain the citation number

of the researcher. The CNpP can be decomposed as follows:

$$CNpP = \frac{Total\ citation\ numbers}{Total\ publication\ number}$$

Co-authors' numbers (CoN) of a researcher as researcher's brand image

To measure CoN, we should count the number of co-authors in the selected publications. If the

researcher collaborates with a researcher more than once it must be counted as one credit.

Publication attributes (PA) as perceived quality

Before calculating PA, institutions or researchers should decide how they treat publications.

They should assign credits for each publication type (PT) selected at the beginning to establish

the model. There are many ways to assign credit for publications. One example is presented

below (Table 1). Institutions and researchers may create similar tables by considering their goals.

For example, while some institutions may place a high value on books, others may put greater value on peer-reviewed journal articles.

Insert Table 1 about here

To calculate PA, this model includes three sub-components: authorship structure, methodological process, and impact of publishing. A description of these sub-components follows. These calculations should be repeated for each publication, then total PA should be calculated.

A- Authorship structure has several dimensions:

1- Contribution level of researcher (CLR) represents how much a researcher contributes to the co-authored publication. There are two primary ways to calculate CLR. The first is to treat all researchers equally. For example, if there are four authors in a publication, the CLR for each author is 0.25 (1/4). The second method is to create a weighted matrix based on the number and order of a publication's authors. An example matrix is presented in Table 2. However, institutions and researchers have flexibility to create this table to meet their goals. For example, in China and other countries, it is common to place a high value on the corresponding author in their performance evaluation process.

Insert Table 2 about here

2- Internationalization of publication team (IPT) considers whether there is at least one

international co-author in co-authored publications. The main reason for this value is that

internationally co-authored publications receive more citations than nationally co-

authored publications or single publications, so act (in)directly as a reflection of quality

(Nguyen, Ho-Le, & Le, 2017). Table 3 presents an example of the IPT calculation when

there are three authors: two or more authors from one institution and from one country,

two or more authors from at least two different institutions from one country, and two or

more authors from two or more institutions and two or more countries (Koseoglu,

Okumus, Putra, Yildiz, & Dogan, 2017).

Insert Table 3 about here

3- Disciplinary background of the publication team (DBPT) reflects whether there is at least

one team member from a different disciplinary background. In other words,

multidisciplinary diversity on a research team is an important indicator of the quality of

the publication (Okumus, van Niekerk, Koseoglu, & Bilgihan, 2018). Therefore, if there

is at least one team member from a different discipline, such as law, the model will give

one credit for those team members. If there are no differences among authors'

disciplinary backgrounds, the model will not assign any credit.

4- Gender difference in the publication team (GDPT) is considered in this model since the

role of gender in collaboration is impactful on the quality of the publication (Kyvik &

Teigen, 1996; Lee & Bozeman, 2005; Melin, 2000; Myers, 1991). This is also important

to encourage collaboration between genders to increase the representation of females in

academic research. In this model, if the publication is coauthored between at least one

male and one female, the model will assign one credit for the team members. If there is

no collaboration among different genders in the publication, the model will not assign

any credit.

5- Granted publication (GP) is valued in the model since granted projects have a robust

process to generate publications. This process is influential in the quality of the

publication. If the publication indicates that it is generated from a granted project, the

model will assign one credit for the team members. If the publication does not indicate

that it is grant funded, the model will not assign any credit.

B- Methodological process (MP): The data collection process for each publication may not

be the same. For example, while researchers need considerable time for an experimental

design, they may need less time for a case study of a specific business organization.

Therefore, they should not be treated equally in the ranking of individuals or in a

performance appraisal, as indicated by Law (2017). To calculate MP, a weighted system

should be used. Table 4 presents an example of methodological processes and their

weights. Institutions and researchers are flexible to create this table to suit their goals.

Insert Table 4 about here

C- Impact of publishing (IP): Each published work generates a different impact in their field.

This impact level shows the quality of a publication (Elliott, 2014; Garfield, 2003; Saha,

Saint, & Christakis, 2003). However, assessing the impact of a published work is

complicated. A few companies (e.g., Clarivate Analytics, SCOPUS) release impact

factors of journals that are accepted in their databases. In this model, institutions and

researchers are free to choose one of these databases to assign IP. In the model impact

factor of publishing what time publication is published must be considered.

Consequently, the PA can be decomposed as follows:

$$PA = \sum PT * (CLR + IPT + DBPT + GDPT + GP + MP + IP)$$

Pseudo Cases

To show how the model works, this study presents two pseudo cases. The first case is related to

performance appraisal in institutions, while the second case demonstrates ranking individuals in

a given discipline or field.

Pseudo Case 1 for performance appraisal

Table 5 presents the coding for and RBEI calculation of a researcher's performance appraisal.

The researcher's first publication was published in 1998. The current year is accepted as 2018.

Within this period the researcher produced 15 publications (Column A in Table 5). Column B

shows publication years. Citation numbers in the current year (CN) were retrieved from the Web

of Science database. The other columns (D, E, F, G, H, I, and J) were filled out based on the

details shared in the previous section. Consequently, PA was calculated for each publication as

follows:

$$PA = L = (D * (E + F + G + H + I + J + K))$$

Insert Table 5 about here

Table 6 demonstrates the calculation of RBEI for a researcher's performance appraisal by using

data from Table 5. RBEI was calculated for the last five years in order to see the changes in the

researcher's RBEIs. Institutions may use the percentages of changes to identify faculty's research performance.

Insert Table 6 about here

Pseudo Case 2 for ranking individuals

This model is useful for ranking individuals in a given discipline or field, in this case hospitality and tourism. For example, a researcher would like to rank individuals who generated publications related to "topic A." First, the researcher must decide publication type, and then extract the publications. Second, the researcher should create a coding table (similar to Table 5) for each author published in relation to topic A. Third, the researcher should generate an RBEI score for each author from a coding table (similar to Table 6). Last, the researcher should rank the authors based on the RBEI scores.

Table 7, Table 8, and Table 9 present the coding tables of three researchers (R1, R2, and R3) who have published in relation to topic A. In this ranking, only research notes and full-text articles published in the Social Science Citation Index's journals are considered. To create the coding tables, the following codes in the current study were assigned.

Insert Tables 7, 8, and 9 about here

Table 10 presents a ranking of these three researchers based on their RBEI scores. In these cases, the order is R3, R2, and R1. In other words, R3 has the highest brand equity in the field.

Insert Table 10 about here

CONCLUSIONS

The present study proposed a new approach for ranking individuals in a given discipline

or field and evaluating researchers' performances in an institution. This study used brand equity

to establish its approach. To show how the model works, two pseudo cases were presented. This

study has significant implications by introducing a new model to the field of research. These

implications are discussed below.

The main contribution of this study is to introduce a new model for individuals' ranking

and the performance appraisal of researchers in the fields of hospitality and tourism. Previous

models have ranked researchers based on the quantity or quality of their publications, as defined

by number of publications or number of times their work was cited, respectively (Dev et al.

2015; Law, 2017). The current model is more holistic since it is based on the idea of brand

equity. In this model, brand equity encompasses three components: perceived quality as defined

by publication attributes, perceived image as defined by number of coauthors, and perceived

loyalty as defined by citation numbers per publication. Additionally, this model considers the

longevity of a researcher's publication life. This model offers controllable performance

indicators to researchers. For example, the previous models consider citation numbers, which

researchers cannot control. In the current model, two out of three indicators (CoN and PA) are

controllable. Therefore, researchers may increase their brand equity score or performance by

focusing on these indicators in the publication generation process.

The hospitality and tourism academic community has two important issues that have not been resolved in many years. One of them is related to conducting interdisciplinary or multidisciplinary research in the field, since a strong attachment to the field is one of the main barriers to interdisciplinary research (Okumus et al., 2018). Another issue is the low representation of females in the academic research community (Munar et al., 2015). This model helps to minimize these problems in academia.

Practical implications

The model is applicable for not only the fields of hospitality and tourism but also other disciplines. By adopting this model, a better performance appraisal system can be established. This model can be used by institutions and researchers who rank individuals in a given field. Additionally, some ranking databases such as Google Scholar Analytics, ResearchGate, Scopus and Mendeley may adapt their ranking system with this model to provide more holistic ranking models.

Limitations and Future Studies

The proposed model has a few limitations. First, to measure brand image and brand loyalty, the model considers only one indicator for each component. This highlights opportunities for researchers to identify new indicators. Second, the effects of social media in the brand equity of researchers are ignored. Researchers may develop new indicators of brand image. Last, since our study's intent is not to rank or evaluate individual faculty members, we show how the model is useful, beneficial, and applicable rather than providing a ranking example of faculty in the fields of hospitality and tourism. These limitations provide new research questions and potential areas of study. First, this study can be repeated to rank individuals.

Second, new, objective hybrid metrics may be developed. Finally, by developing a scale for

identifying metrics of quality of research, researchers may redesign PA indicators.

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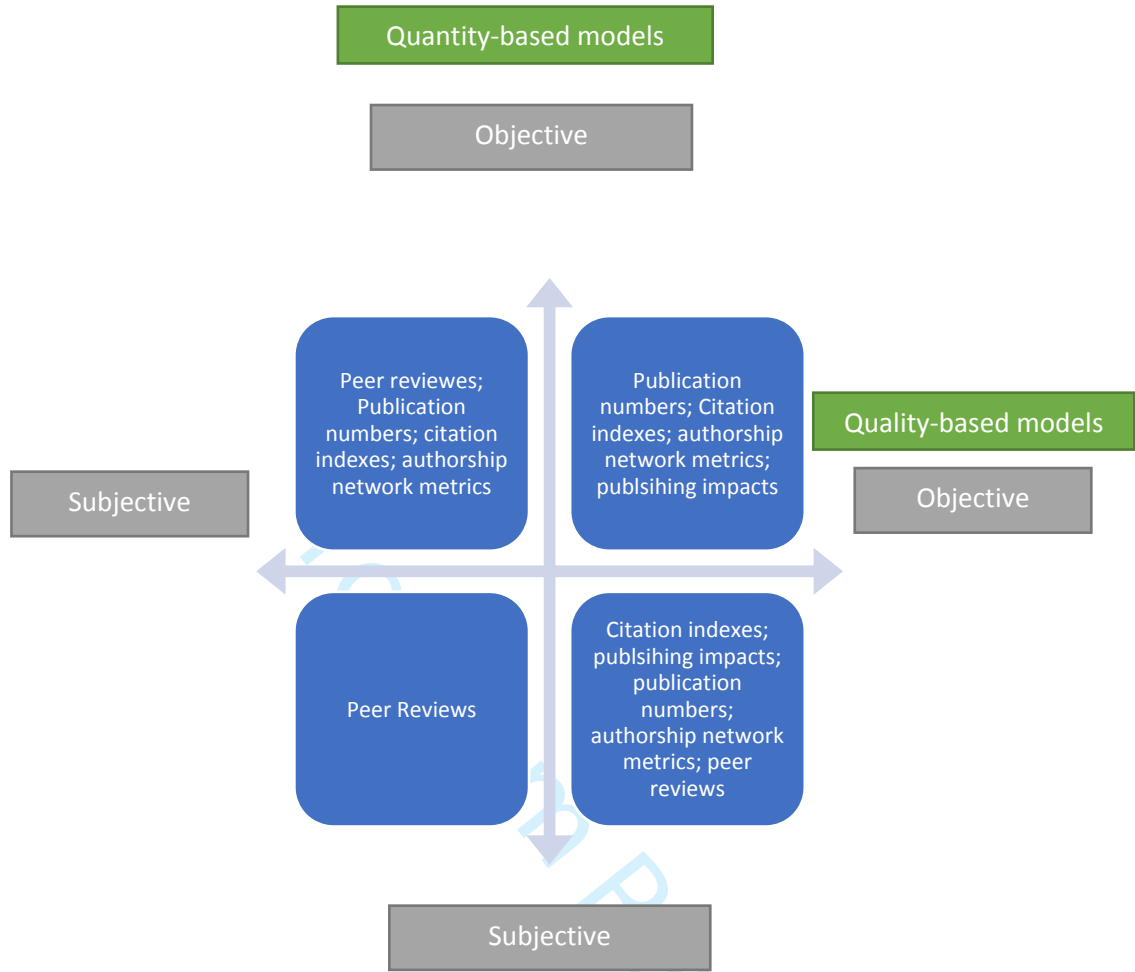
Figure 1. Hybrid individual ranking models

Source: Developed based on the following studies Dev et al. (2015) and Law (2017)

Table 1: Type of publication (PT) and assign credits

Publication Type	Assign credits
Full text article, book,	1
Research note, chapter in an edited book	0.6
Conference proceedings	0.3
Others	0.1

Table 2. Value for CLR

Author Number	Author Order				
	1st	2nd	3rd	4th	5th or higher
1 Author	1	-	-	-	
2 Authors	0.65	0.35	-	-	
3 Authors	0.55	0.30	0.15		
4 Authors	0.55	0.25	0.125	0.075	
5 or more authors (n)	0.55	0.25	0.10	0.050	0.05/(n-4)

Table 3: IPT and assign credits

IPT Type	Assign credits
Two or more authors from at least two or more institutions and at least two or more countries	1
Two or more authors from at least two different institutions from one country	0.6
Two or more authors from one institution and from one country	0.3

Table 4: MP and assign credits

MP	Assign credits
Experimental desing, or mix methods, or longdituinal methods	1
Qualitaitve study, or quatitattive study, or case study, or conceptual studies	0.7
Tradational review studies	0.4

Table 5. Coding for RBEI Calculation of a researcher's performance appraisal

Publication No A	Publication Year B	Citation number in the Current Year (CN) C	PT D	CLR E	IPT F	DBP T G	GDP T H	GP I	MP J	IP K	PA L
1	1998	50	1	1	-	-	-	-	0.7	0.66	2.36
2	1999	6	0.6	1	-	-	-	-	0.4	-	0.84
3	1999	9	0.3	0.65	0.3	-	-	-	0.7	-	0.50
4	2003	50	0.1	0.35	0.3	-	-	-	0.7	-	0.14
5	2003	30	1	0.3	0.3	-	-	-	0.7	2.3	3.60
6	2006	65	1	0.15	0.6	1	-	-	0.7	-	2.45
7	2006	-	1	1	-	-	-	-	0.7	3	4.70
8	2006	-	0.6	0.65	1	1	1	-	0.7	-	2.61
9	2009	4	0.3	0.65	1	-	-	-	0.7	-	0.71
10	2010	150	0.3	0.08	0.3	-	-	-	0.7	-	0.32
11	2013	360	1	0.25	0.3	-	-	-	0.7	-	1.25
12	2014	3	1	0.13	1	-	-	-	0.7	0.99	2.82
13	2015	30	0.6	0.15	1	-	1	-	0.7	-	1.71
14	2015	1	1	1	-	-	-	-	0.7	-	1.70
15	2018	5	1	0.25	0.3	-	-	-	0.7	-	1.25
Total		763	-	7.6	6.4	2	2	-	10.2	6.95	26.94

Table 6. Calculation of RBEI for a researcher's performance appraisal

RBEI	RBEI for 2014	RBEI for 2015	RBEI for 2016	RBEI for 2017	RBEI for 2018
Year of first publication	1998	1998	1998	1998	1998
Current year	2014	2015	2016	2017	2018
LR as year *(Current year- Year of first publication+1)*	17	18	19	20	21
LR as month *(LR*12)*	204	216	228	240	252
LR as day (LR*365)	6205	6570	6935	7300	7665
CNpP *(ΣCN / Σ Publication No)*	60.58	54.14	54.14	54.14	50.87
CoN	3	5	5	5	6
PA *(D*(E+F+G+H+I+J+K))*	22.28	25.69	25.69	25.69	26.94
RBEI per year	238.23	386.41	366.07	347.77	391.56
RBEI per month	19.85	32.20	30.51	28.98	32.63
RBEI per day	0.65	1.06	1.00	0.95	1.07
Change %	-	62.20	-5.26	-5.00	12.59

Table 7. Coding for RBEI Calculation of ranking of R1

Publication No A	Publication Year B	Citation number in the Current Year (CN) C	PT D	CLR E	IPT F	DBPT G	GDPT H	GP I	MP J	IP K	PA L
1	2000	362	1	0.3	0.3	-	1	-	0.4	1.2	3.20
2	2005	65	1	1	-	-	-	-	0.7	2.3	4.00
3	2006	10	1	0.15	0.3	1	1	1	0.7	2.1	6.25
4	2007	-	0.6	1	-	-	-	1	0.4	1.6	2.40
5	2010	23	1	0.65	1	-	-	-	0.7	2.5	4.85
6	2015	45	1	1	-	-	-	-	0.4	2.6	4.00
7	2017	-	1	0.075	1	1	1	1	1	2.5	7.58
8	2018	5	1	1	-	-	-	-	0.7	3	4.70
9	2018	15	0.6	0.55	0.6	-	-	-	0.7	1.5	2.01
Total		525.00	-	5.73	3.20	2.00	3.00	3.00	5.70	19.30	38.99

Table 8. Coding for RBEI Calculation of ranking of R2

Publication No A	Publication Year B	Citation number in the Current Year (CN) C	PT D	CLR E	IPT F	DBPT G	GDPT H	GP I	MP J	IP K	PA L
1	1992	2500	1	1	-	-	-	-	0.7	3	4.70
2	1994	600	1	0.65	0.3	-	-	-	0.7	2.5	4.15
Total		3100	-	1.65	0.3	-	-	-	1.4	5.5	8.85

Table 9. Coding for RBEI Calculation of ranking of R3

Publication No	Publication Year	Citation number in the Current Year (CN)	PT	CLR	IPT	DBPT	GDPT	GP	MP	IP	PA
A	B	C	D	E	F	G	H	I	J	K	L
1	2015	100	1	0.15	1	-	1	-	0.7	3.5	6.35
2	2016	20	1	1	-	-	-	-	0.7	1	2.70
3	2018	1	1	0.075	1	1	-	1	1	2.9	6.98
4	2018	-	1	0.25	1	0	1	0	0.7	3.01	5.96
5	2018	-	1	0.55	1	1	1	1	1	5	10.55
6	2018	1	1	0.65	1	-	-	-	0.7	2	4.35
Total		122		2.675	5	2	3	2	4.8	17.41	36.89

Table 10. Calculation of RBEI for ranking of Researchers

RBEI	RBEI for R1	RBEI for R2	RBEI for R3
Year of first publication	2000	1992	2015
Current year	2018	2018	2018
LR as year *(Current year- Year of first publication+1)*	19	27	4
CNpP *(ΣCN / Σ Publication No)*	58.33	1550.00	20.33
CoN	4	1	4
PA *(D*(E+F+G+H+I+J+K))*	38.99	8.85	36.89
RBEI per year	478.76	508.06	750.00