

The Classification Weight Method Used in the Tentative Siftings of Scientific and Technological Papers

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Abstract. In order to speed up the work of reviewing manuscripts and improve the quality of the manuscripts, the weight method is used to sift the scientific papers for large-scale contributions. By using this method, we simulate the tentative siftings from about 2000 manuscripts contributed to Journal of Wuhan University of Technology- Materials Science Edition (JWUTMS) in 2015 and 2016. The results showed that the weight index system can speed up the manuscript's preliminary examination and is consistent with the actual review results.

Introduction

Reviewing the manuscript is the key step to ensure the academic quality of the academic journals, so the quality of innovation and research must be the first criterion of the manuscript^[1]. Periodical review is to recommend excellent essays, publish them as soon as possible, and offer constructive suggestions to those seemingly good but defective ones, so as to make them better. Therefore, the review is an important part of helping the authors to achieve an excellent paper. China's science and technology periodicals generally adopt the "three trial system", that is, the editor's first trial, the expert external trial and the chief editor in the final trial. In the case of large scale of contributions, the task of the first trial is time-consuming and laborious. The weight method is used in this paper to tentatively sift the scientific papers, which will increase the work efficiency.

Experimental

Theory basis of classification weight method

The classification weight method is a simple way to determine the weights of all factors according to the principle of "important minority and minor majority", and it is also a main and secondary factor analysis method commonly used in management statistics analysis. All factors in the index system are queued according to their importance and influence degree, and then different weights are used to weigh all kinds of factors^[2].

According to the principle "the key minority and the minor majority", that is, the few assessment elements occupy the most important position, the concrete steps are as follows:

a. The queuing stage: First of all, the factors are analyzed, and then according to the degree of influence and the importance of each factor, all the factors are arranged in order according to their importance.

b. Classification stage: All the factors are divided into three categories, namely:

Class A: the main factor, accounting for about 10% of all factors;

Class B: secondary factors, accounting for about 20% of all factors;

Class C: general factors, accounting for about 70% of all factors.

c. The stage of weight setting: According to the result of the factor classification, three kinds of factors such as A, B and C can be given different weights of 3, 2 and 1.

In conclusion, we should emphasize on one or few factors and consider the situation comprehensively to maintain a basic balance^[3]. At present, the method to determine the weight of index can be divided into 3 categories: subjective weighting method, objective weighting method,

and the objective combined with subjective weighting method. Based on the actual work experience, this paper uses the subjective empowerment method to establish the statistical table of the weight method^[4-8].

Weight setting for the tentative siftings of scientific and technological papers

Table 1. Statistical table of weight setting for the tentative siftings of JWUTMS.

Index	Weight	Score				
1. Academic credential of the first author	30	Post-doctoral 4	Doctoral 3	Master 2	Undergraduate 1	Below undergraduate 0
2. Professional titles of the first author	25	Professor 4	Associate professor 3	Lecturer 2	Teaching assistant 1	No title 0
3. Scientific research fund	20	National level 4	Provincial level 3	Municipal level 2	School level 1	Without fund 0
4. English level	10	Excellent 4	Good 3	General 2	Bad 1	Non English 0
5. Correlation with material science	15	New discipline 4	Traditional discipline 3	Cross discipline 2	Weak correlation 1	Irrelevant 0

For the tentative siftings of *Journal of Wuhan University of Technology- Materials Science Edition* (JWUTMS), more objective indexes are used, and indexes 1, 2, and 3 can be distinguished by the computer. As for the 4th, English level, English native speaker author is set as excellent and the manuscript may be reviewed by WORD software to score according to the number of errors. As for index 5, the correlation with material science, such subjects as the piezoelectric ceramic, proton exchange membrane fuel cell, and so on can be set as new disciplines; The traditional cement, glass, ceramics and so on can be set as the traditional disciplines. Other disciplines related to materials science are set as a cross discipline. If the manuscript has low correlation but has academic terms of materials science, it can be set as weak correlation. If the manuscript has low correlation and has no academic terms of materials science, it can be set as irrelevant.

Application of the weight statistics table

According to the score obtained from the weight method statistics table (Table 1), the manuscripts can be dealt with respectively.

- a. Since all of the 5 indexes is important to guarantee the quality level of scientific journals, if any of which scores 0, the manuscript will be rejected;
- b. The passing line is set to be 200. Manuscripts scored below 200 will be rejected too;
- c. Manuscripts scored higher than 300 will obtain priority processing.
- d. Communication with authors without delay

For the rejected manuscript, we can contact with the authors, and inform them the flaws. For example, some authors did not realize the importance of scientific research fund or the level of English was not good enough, they can revise the essay and contribute again later.

Simulation Results

Table 2. Comparison between the simulated and actual tentative siftings of JWUTMS

Year	Amount of manuscripts received	Amount of actual rejected manuscripts	Amount of simulated rejected manuscripts	Anastomosis rate of rejection
2015	979	489	492	95%
2016	880	445	439	93%

Nearly 2000 articles contributed to JWUTMS from 2015 to 2016 were chosen to simulate the tentative siftings by classification weight method, and the results are list in Table 2. The results show that by using classification weight method, the tentative siftings can be accelerated, and the results coincide with the actual treatment. Compared with traditional methods, this method has the advantages of high efficiency and accurate evaluation, which is of great significance for speeding up manuscript processing, reducing labor intensity and improving the quality of journals.

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