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Application Models of Highly-Cited Paper Analysis in Journal Operations: A Case Study of *Wood Industry* Postprint

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Abstract

Taking *Wood Industry* journal as a case study and based on the CNKI database, this paper systematically analyzes the main characteristics of 104 highly-cited academic papers published in the journal from 2006 to 2020, including citation frequency, download counts, leading authors, degree of collaboration, publishing institutions, document types, keywords, and the correlation between download frequency and citation frequency. Furthermore, it explores application models for the analysis results of highly-cited papers in journal operations to provide reference for topic planning and enhance the journal's academic influence.

Full Text

Preamble

Title: Analysis of Highly Cited Papers in Journal Operations: A Case Study of *Wood Industry*

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Abstract: This paper examines *Wood Industry* magazine as a case study to systematically analyze the characteristics of 104 highly cited academic papers published between 2006 and 2020. Based on the China National Knowledge Infrastructure (CNKI) database, we examine citation frequency, download counts, primary authors, collaboration levels, contributing institutions, document types, keywords, and the correlation between downloads and citations. We further explore application models for integrating these analytical results into journal operations, aiming to provide references for topic planning and enhance academic influence.

Keywords: highly cited papers; characteristics; influence; journal operations

1. Materials and Methods

On February 28, 2021, we accessed the CNKI platform to conduct a precise search for scientific papers published in *Wood Industry* magazine between January 1, 2006, and December 31, 2020. We selected the top 100 papers by total citation frequency as our research sample, recorded their main characteristics in Excel for statistical analysis, and employed VOSviewer software to analyze keyword frequency and co-occurrence patterns.

2. Results and Analysis

2.1 General Overview

The overall distribution of 104 highly cited papers from the past 15 years is presented in Table 1 . These papers accumulated 3,572 total citations, with individual paper citations ranging from 7 to 146 and an average of 34.35 citations per paper. Download statistics show 52,288 total downloads, with individual paper downloads ranging from 54 to 2,440 and an average of 502.77 downloads per paper.

2.2 Primary Authors

The 104 highly cited papers involved 343 author contributions. Among them, 65 authors (78.3%) published a single highly cited paper, while 18 authors (21.7%) published two or more. Specific details are provided in Table 2 . Notably, Yu Wenji from the Institute of Wood Industry, Chinese Academy of Forestry, published four highly cited papers with 341 total citations and 3,146 total downloads. Qian Xiaoyu from the China National Forest Products Industry Association also published four highly cited papers with 161 total citations and 2,243 total downloads. Sixteen other authors, including Gu Lianbai, Wu Zihui, and Jiang Zehui, each contributed two highly cited papers.

2.3 Collaboration Patterns

Collaboration degree and co-authorship rate are key indicators of research collaboration. As shown in Table 3 , 18 of the 104 highly cited papers (17.31%) were single-author works, yielding a co-authorship rate of 82.69%. With 343 total author instances across 104 papers, the average collaboration degree was 3.30 authors per paper.

2.4 Contributing Institutions

The 104 highly cited papers originated from 28 institutions, including 12 universities (42.86%), 6 research institutes (21.43%), 2 quality inspection agencies

(7.14%), 5 enterprises (17.86%), and 3 associations (10.71%). This distribution indicates that universities and research institutes are the primary sources of highly cited papers in *Wood Industry*. The top 10 institutions by output are listed in Table 4. The Institute of Wood Industry, Chinese Academy of Forestry, led with 47 highly cited papers (45.19%), followed by Nanjing Forestry University with 14 papers (13.46%). Beijing Forestry University and the China National Forest Products Industry Association tied for third place, each contributing 4 papers (3.85%).

2.5 Document Types

The analysis revealed 56 review papers (53.85%) and 48 research articles (46.15%). Review papers accumulated 2,280 total citations with an average of 21.92 citations per paper and 39,569 total downloads with an average of 380.47 downloads per paper. Research articles totaled 1,292 citations with an average of 12.42 citations per paper and 12,714 downloads with an average of 122.25 downloads per paper. Notably, review papers in *Wood Industry* demonstrated significantly higher average citation and download rates than research articles.

2.6 Research Themes

Keyword co-occurrence analysis, illustrated in Figure 1 [Figure 1: see original paper], reveals the research landscape. Node size represents keyword frequency, line thickness indicates co-occurrence frequency, and node color clusters related research topics. The analysis shows that the primary research objects over the past 15 years have been wood, wood-based panels, recombinant bamboo, and timber structures, with major themes encompassing heat treatment, modification, formaldehyde emission, and physicochemical properties.

2.7 Correlation Analysis Between Downloads and Citations

We analyzed the correlation between total downloads and total citations for the 104 highly cited papers using Excel. The results, shown in Figure 2 [Figure 2: see original paper], yield a coefficient of determination (R^2) of 0.3778. This indicates a moderate correlation between download frequency and citation frequency, but not a simple linear relationship. High download counts do not necessarily guarantee high citation rates, as numerous factors influence both metrics and their underlying motivations are complex.

3. Application Models in Journal Operations

Based on these findings, journal editorial offices can implement the following strategies to enhance academic influence:

First, although highly cited paper authors are relatively dispersed, contributing institutions are concentrated, primarily comprising forestry research institutes

and universities. Editorial offices should leverage their host institution's academic resources to expand outreach to high-caliber forestry universities and research institutes, such as the College of Materials Science and Engineering at Northeast Forestry University and the College of Materials Science and Engineering at Central South University of Forestry and Technology. This can be achieved through campus presentations and journal promotion, inviting prestigious institutions to become co-sponsors, supporting units, or editorial board members. Establishing a journal council to incorporate organizations with concentrated high-quality output, complete with operational mechanisms, can further broaden the journal's collaborative network.

Second, the high collaboration degree in highly cited papers reflects that top-tier research typically requires teamwork. Editorial offices should maintain close contact with productive research teams, deeply explore their research domains, and invite team leaders or key members to serve as editorial board members, advisors, or reviewers, integrating them into the journal community. Establishing regular communication mechanisms and conducting targeted solicitations based on their research directions—particularly increasing the proportion of invited review papers—can help build a stable pool of high-level authors.

Third, since research objects primarily include wood, wood-based panels, recombinant bamboo, and timber structures, with themes covering heat treatment, modification, formaldehyde emission, and physicochemical properties, editorial offices can plan special issues focused on the material properties and high-value utilization of plantation wood and bamboo. Against the backdrop of China's comprehensive commercial logging ban in natural forests and the resulting supply-demand imbalance for quality timber, fast-growing plantation wood and bamboo can meet growing consumer demand while alleviating resource constraints. The material properties of wood and bamboo form the foundation for high-value utilization and represent enduring research hotspots. Editorial offices should organize special issues inviting contributions from forestry government departments, universities, research institutions, quality inspection agencies, and enterprises from diverse perspectives.

Fourth, editorial teams must monitor emerging interdisciplinary developments. As wood science and technology rapidly evolve, new technologies, concepts, and methods continue to emerge. While maintaining coverage of traditional wood science research, editorial offices should track developments in cutting-edge interdisciplinary fields to guide targeted solicitation efforts. Examples include artificial intelligence applications in wood identification, super wood, transparent wood, digital transformation of the wood industry, and wood culture.

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Note: Figure translations are in progress. See original paper for figures.

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