ScienceDirect’s pre–1995 backfiles as a critical research tool in developing a comprehensive body of knowledge in a paper
About Dr. Bikramjit Basu

Dr. Bikramjit Basu, Professor at the Indian Institute of Science, Bangalore, works extensively in the area of material science.

A prolific researcher, he has authored/co-authored more than 200 peer-reviewed research papers and received prestigious accolades from the Indian Ceramic Society (2003), Indian National Academy of Engineering (2004) and Indian National Science Academy (2005). He has also won the Metallurgist of the Year Award (2010) by the Ministry of Steel, Government of India, NASI–SCOPUS Young Scientist Award (2010) by Elsevier partnered with the National Academy of Sciences, India (NASI), as well as the Coble Award for Young Scholars (highest recognition for any young ceramicist around the world of age 35 or under) from the American Ceramic Society (2008).

In the history of Indian Science, he is the youngest Materials Scientist to receive India's most coveted Science award, Shanti Swarup Bhatnagar award (2013) from the Government of India. Among Dr. Basu's published works, 38 percent appeared in Elsevier's journals such as Scripta Metallurgy, Acta Metallurgy, Biomaterials, Materials Science & Engineering, Journal of the European Ceramic Society and Materials Letters.

Dr. Bikramjit Basu's work spans across two areas in material science—Engineering Ceramics and Biomaterials. In the Engineering Ceramic field, he specialises in establishing in processing-microstructure-property correlation and works on processing conditions that enhance the toughness and strength of the ceramic systems. Over the last decade, he has devoted his research to the fabrication of cutting-edge prototypes for applications such as cutting tool inserts, re-entry space vehicles and body armours. In the field of Biomaterials, he designs implantable biomaterials such as Carbon nanofiber composites for myocardial tissue engineering applications and Indian patient-specific hybrid polymer-ceramic and zirconia-toughened alumina based femoral ball head and acetabular socket prototypes for total hip replacement surgery.

The importance of being an earnest reader

Be it any research area, Dr. Basu feels that it is imperative for a researcher to be kept informed of the development of one's field. “Particularly if you are embarking on interdisciplinary research work, the latest scientific articles from different disciplines will aid you in your preparation for your investigation and the eventual publication of your results,” he notes. “Personally, reading scientific papers has helped me tremendously. For example, through journal articles, I was able to study the fundamentals of biological science, which has enabled me to contribute to the field of biomaterials. Today, I am India’s top author in this area.”

To further illustrate his point, Dr. Basu explains that he has patented a unique multi-stage Spark Plasma Sintering approach that established a critical “process window” and resolved major processing challenges in developing high temperature ceramics, an achievement to which he attributed to continual learning through journal articles.

Citing older works from ScienceDirect’s pre-1995 backfiles

“I can’t emphasize enough on the importance of scientific literature that dates back 20 or 30 years ago. The availability of a complete volume of journals will be an asset to you, when it comes to writing high-quality papers. When you have access to articles published from volume 1, issue 1 to the latest issue, you are able to present a well-researched discourse that are inclusive and credible. If you do a citation analysis of my published papers, you’ll find a good 28 percent made references to articles published prior to 1995 because the key work on transformation toughening of zirconia was done by researchers in the 1970s and 1980s.

In the field of Biomaterials, the pioneering work On the Piezoelectric Effect of Bone by Fakuda and Yasuda (1957) led us to the design and development of piezobio composites of hydroxyapatite (HA) with perovskites such as barium titanate (BaTiO3) and calcium titanate (CaTiO3). This further inspired us to expand the horizon of our research on bone mimicking materials to HA-based multifunctional composites of mullite and Fe3O4. “

The practice of citing older papers is also prevalent among other researchers at the Indian Institute of Science, the university in which Dr. Basu is working. Of the total publications authored by its faculty, 16 percent of the citations are attributed to Pre-1995 content, and 20 percent of all 2015 publications to Elsevier’s Pre-1995 Backfiles.
“If I receive a paper for review and it lacks essential reference from older works, I would usually recommend the author to do more comprehensive literature survey and return the paper for revision. The same applies for grant and scholarship award applications.”

—Dr. Bikramjit Basu

As an editorial board member and reviewer for many leading journals, Dr. Basu advises aspiring scholars and authors to ensure the inclusion of broad-based reference not just to recent works, but to the full body of knowledge in that particular field. “If I receive a paper for review and it lacks essential reference from older works, I would usually recommend the author to do more comprehensive literature survey and return the paper for revision. The same applies to grant and scholarship award applications,” he says.

Reducing time spent on searching for the right information

In today’s research landscape where inter-, intra- and multi-disciplinary as well as collaborative research are best appreciated, having easy access to relevant information is the key to success. According to an International Data Corporation (IDC) research Time Spent on Information Tasks, a worker on average spends 9.5 hours on searching and another 8.3 hours gathering information per week. Elsevier Research in Q1 2012 also indicated that an average of 3 hours and 41 minutes per week was spent on searching for research information, and another 5 hours 36 minutes per week reading research articles.

With over 7 million science researchers globally, a researcher’s investigative process should be made as effective as possible to remain competitive. Having a readily available online scientific literature solution such as ScienceDirect allows for greater efficiency. “The scientific paper that we submit for publication should be novel, and the novelty is directly related to time. For what you want to publish today may be novel, but you cannot be so sure of its novelty the very next day. Time is of the utmost essence in research.”

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