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EDITORIAL SCOPE – STRUCTURE AND MATERIAL EDITION

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Abstract — This first-ever Editorial Scope of the Journal of Civil Engineering, Science and Technology (JCEST) touches the scientometrics of one of the main civil engineering disciplines, structure and material, in the publication realm. This brief editorial piece highlights the emerging and highly investigated themes in the last 5 years by gathering information from the wealth of the freely accessible Scopus database. Also, the most researched and published areas of JCEST within this period from the perspective of popular keywords are assembled and presented. The overlapped terms of the widely researched topics from the two sources are then captured to show their common publication territories of attention. This exercise aims to offer a brief guide for authors to better plan and navigate their knowledge quest to fit the currently trailblazing research curiosity and interest.

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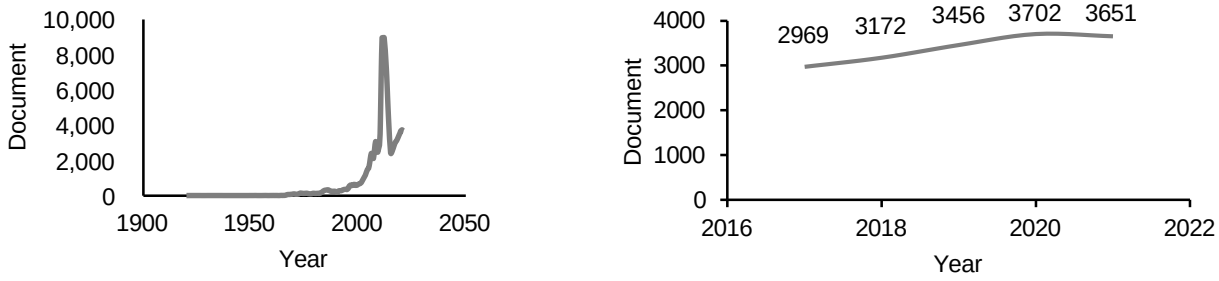
***Keywords*:** structure, material, JCEST, civil engineering, Scopus

1.0 INTRODUCTION

A recent research methodology coaching session with Ph.D. students has invoked this editor's curiosity to rekindle with the core concept of qualitative and quantitative studies. With the rush of data traffic in the information age, numbers feed the makeup of quality and vice versa. The coining of "scientometrics" by Vassily Nalimov since the 1960s has catapulted the appraisal of scientific works via the measure of metrics [1]. Quality of things is nowadays associated tightly with presentations and achievements in various forms of numbers. Hello, statistics plus fancy charts and infographics. Gone were the days when researchers simply needed to report observations and findings on the scientific and historical progress of our surrounding phenomena through a systematic peer-review event. Everything now is about numbers and the quality of the publication is justified by numbers presented with metrics. The debate on the validity of these metrics is beyond the scope of this short essay. Let us explore what the numbers tell us.

2.0 GLOBAL PUBLICATION STATISTICS



(a) (b)

Figure 1 Number of published documents by year: (a) overall and (b) recent 5 years (keyword: civil AND structure OR material) [2]

Resulted from the searching of "civil" AND "structure" OR "material" as keywords, Figure 1 presents the published document by year (up to 2021) as extracted from the Scopus database [2]. In the recent 5 years, the numbers of relevant documents curated in the platform are consistently around 3,000 or more. The breakdown of disciplines related to civil structures and materials sees the engineering field as the most dominant, taking almost a half of the contribution chunk as disclosed in Figure 2. The second and third main contributors are those from social sciences and materials science, respectively. Others cover a combination of various other lesser contributing areas. Of most interest to the civil structures and materials research community, the top 10-ranked keywords in descending order of document contributing number are **civil engineering, building materials, finite element method, construction equipment, reinforced concrete, structural design, concretes, structural analysis, structural health monitoring**, and **design** [2]. Of these and by limiting to engineering, **geopolymers** [3] is at present the leading article, attracting a whopping 2411 citations at the time of writing, followed by those titled **structural control** [4]**, structural optimization** [5]**, structural health monitoring** [6], and **fiber-reinforced polymer composites for construction** [7] in rounding-up the top 5 most cited papers. Moreover, signal processing [8] and machine learning (artificial neural network) [9] are the next two emerging themes gaining wide attraction in the publication interest.

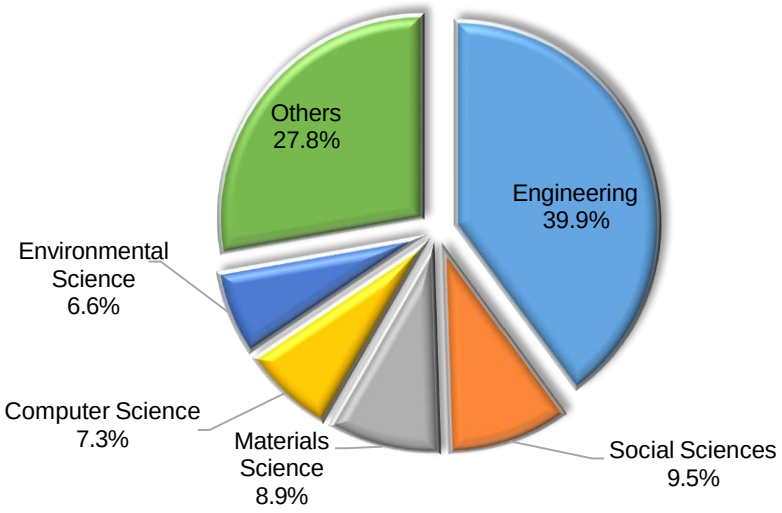


Figure 2 Document percentage by topic (keyword: civil AND structure OR material) [2]

3.0 JCEST PUBLICATION TREND

It can be held that the counts of publication activity abide by the following trend: download > read > citation, i.e., the download count of one research paper is always higher than those of reading and citation. As the intention of this editorial piece is to briefly highlight the main contributing keywords and areas as observed from the JCEST publication trend, no deep analysis or simulation is carried out. Rather, the presented numbers are those readily computed by the open-source journal system. Having stated this, these numbers offer an early guide and better hindsight into the highly sought-after themes and topics in the various structure and material areas of civil engineering. In promoting the authors' works, we unveil, up to the current writing time, the most downloaded 2021 papers on our recent Facebook post of JCEST @ https://www.facebook.com/JCESTUNIMAS/posts/919581658729365 with the highest download count coming from the paper on material, waste marble dust. Materials studies especially on concrete with their variety choice of constituents have been well cited by the research community worldwide, thus cementing the strong footing of this theme in the journal. No pun intended! Furthermore, the most cited paper of JCEST is the work of Yong and Teo [10], which employed recycled aggregates in concrete. Probing the key elements of structure and material papers published in JCEST, we find a strong appearance of keywords, such as **concrete, strength, foamed concrete, compressive strength, construction, material, steel, waste, conventional, properties, water, marble, cement, fiber/filler**, **replacement,** etc. as summarized in Figure 3. The normalized influence represents the appearance of a particular keyword divided by that mostly found in the titles, abstracts, and keywords; concrete being is the most popular word in the structure and material papers of JCEST. Furthermore, the popularity of the keywords used in the structure and material field is reflected by their font size in the keyword cloud chart in Figure 4 [11]. These are the terms widely available in the vast majority of JCEST papers from the last 5 years.

4.0 THE COMMON GROUND AND THE WAY OF THE FUTURE

It is worth noting that overlapping can be noticed in these terms by matching those top-ranked from documents published globally as compiled from the Scopus platform. The popular keywords from JCEST that resonate with those highly researched from the Scopus database are, to name a few, **concrete** [12–14]**, foamed concrete** [13, 15]**, geopolymer** [16]**,** various innovated **construction materials** [12, 14, 17]**,** and **fiber/filler** [14, 18, 19], hence, echo undisputedly the importance of studies published in JCEST. In awaking the sustainability prospects [20], it is notable to see that the recycling and repurposing of agricultural and industrial wastes into construction materials have been the chief theme of works published in JCEST. The recently examined major materials comprise marble and quarry dust as well as oil palm ash and fiber [15, 17, 21–23] as potential substitutes in concretes and pavements. This is mirrored strongly in the popular keywords of JCEST; **waste** and **replacement**.

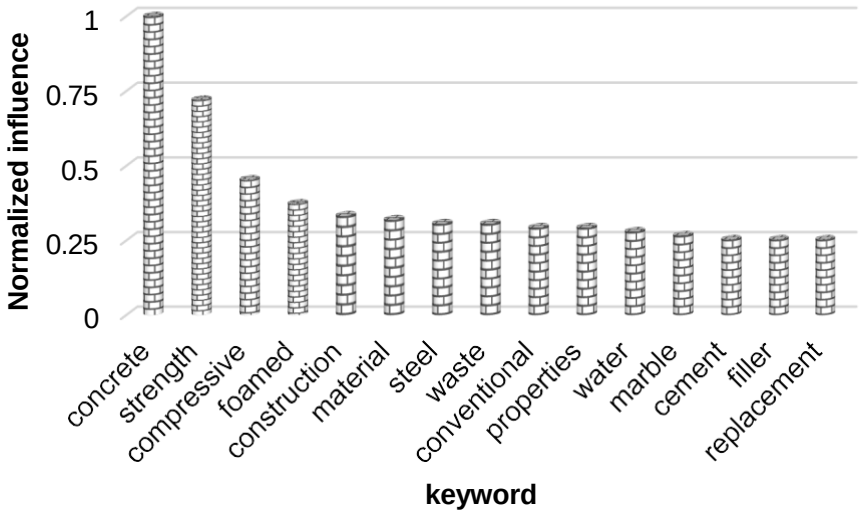


Figure 3 JCEST keyword influence

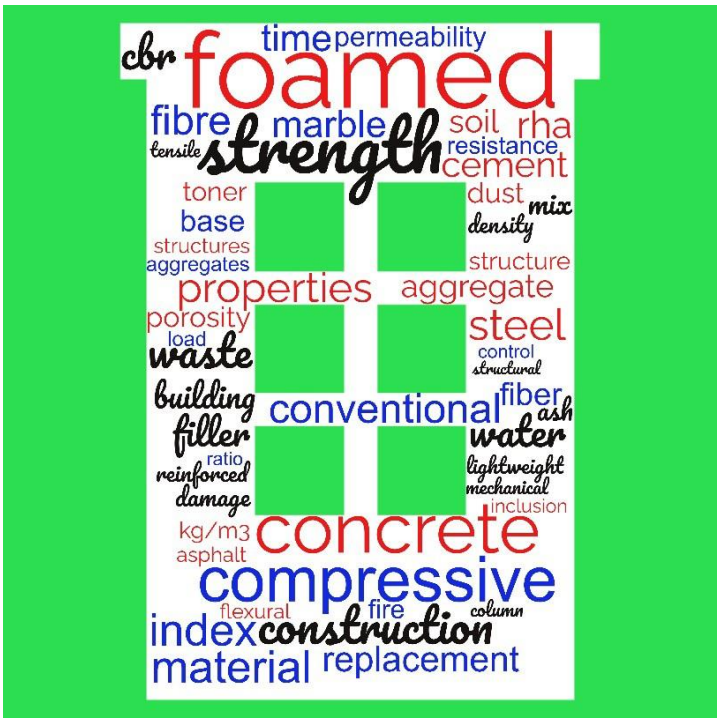


Figure 4 JCEST keyword cloud

In closing, fitting the accelerated worldwide constructional efforts in sustainable development and waste reduction while looking toward incoming challenges, an analysis in Scopus keywords finds that for the construction industry, the Internet of Things (IoT) has been gaining serious traction in project design (green), to orchestrate construction site works (dark orange), and to perform building information modeling (BIM) as shown in the keyword cloud chart in Figure 5. Hence, these are the emerging areas of emphasis to investigate in the foreseeable future in the civil engineering structures and materials discipline.



Figure 5 Keyword cloud chart [2]

5.0 CONCLUSION

A new JCEST editorial initiative to probe into the themes that stir the most current civil engineering research, specifically in the territories of structures and materials, was conducted. The data was obtained from the Scopus database and JCEST's publication trend. The topmost key terms that appeared in both sources were identified. Some overlapped themes had also been highlighted, thereby emphasizing the dominance of these works in the civil engineering structure and material studies in both sources. To motivate further the field, strongly emerging and prospective research arenas were pinpointed. See you in the next editions for the other disciplines of JCEST!

Conflicts of Interest

The author declares that there are no conflicts of interest regarding the publication of this paper.

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