

Bibliometric Analysis of scientific production in ergonomics in design area: the changes and future trends.

Melissa M Vasquez ¹, Guilherme S Bertolaccini ², Liara M de Mattos ³, Fausto Orsi Medola ⁴, Luis Carlos Paschoarelli ⁵.

Av Eng Luiz Edmundo Carrijo Coube, nº 14-01, Bauru, São Paulo, Brazil, 17033-360

¹ melissamava@gmail.com, ² guilhermebertolaccini@gmail.com, ³ liaramattos@gmail.com, ⁴ fausto.medola@faac.unesp.br, ⁵ paschoarelli@faac.unesp.br

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1 Context

In the field of design, ergonomics is considered essential part of the product development process or systems to the good performance of activities of daily living, thus allowing the development of material culture that provides welfare conditions and quality of life. Ergonomics allows the designer a detailed understanding of the user who will be in contact with your product or system and the way it helps to define aspects of use, possibilities and user limitations.

However, some problems arise due to lack of research in the construction of technological interfaces and can generate constraints to users, in spite of scientific research in the area of ergonomics and design have intensified over recent years, taking great importance in matters of development of more efficient products. Aspects such as inclusive design, universal design, usability, intuitiveness, now have become central focus in the field of ergonomic design generating discussions and research that expand and strengthen this area of knowledge.

This study aims to quantify and analyze the articles about ergonomics and design published in the period 2010 to 2015 in the journal *Applied Ergonomics*. Aiming to show the aspects that are being treated in scientific research. That way guiding researches that need to find the last studies and indicate the changes, and the future tendencies in the field of design and ergonomics

2 Method

Using a research technique called bibliometric. The primary source of bibliometric search was the Scopus collection due to its availability. Its advanced search options and presentation of information, which make it easier and more effective the process of analyzing the results, and have greater documentary coverage (CANEDO, et al., 2010).

The concept used in this bibliometric was restrict the ergonomics area in the design field. To perform the bibliometric research, the process was divided into two broad - based phases in the bibliometric study of Curimbaba (2015) -: a) filtering and data export, and b) analysis, reading and writing of the final document.

The papers in the journal Applied Ergonomics was analyzed by the keyword method - keyword extraction - which identifies the most popular topics on scientific papers. Subsequently, was developed a database with the keywords of each of the papers in the journal, from the year 2010 until 2015.

3 Results

Initial search in the Scopus database, revealed that exists 35069 publications. The number of publications has grown steadily over the years, until the year 2012 when there was a large increase in published papers, reaching 2201.

The country that publishes more papers in the area of ergonomics and design are the United States with about 10,299 papers, followed by the UK (3049) and Germany (1615). Brazil has 716.

The type of the most prominent scientific publication is the article, and 14876 (45.7%) of the number of published papers are scientific articles. Works published in proceedings correspond to 38.7% of the total assessed (12591), other types of publication corresponds to 15.6% of the total. The most prominent areas are social sciences (43.5%), Engineering (38.8%) and medicine (25.2%).

It was decided to concentrate the search in the area of Social Sciences. Therefore, we chose to continue the analysis according to the journal with the highest impact factor (IPP). In the area of ergonomics and design was the journal Applied Ergonomics (IPP: 2,081), covering an average of 900 publications, followed by Ergonomics (IPP: 1,602) and the International Journal of Industrial Ergonomics (IPP: 1,431). Finally, it has generated a new database of keywords of Journal Applied Ergonomics (figure 3).

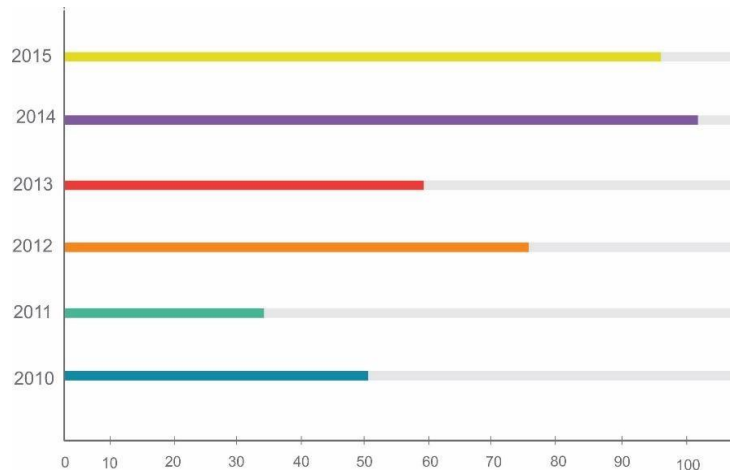


Figure 3. Number of publications related to design in the journal Applied Ergonomics per year. Source: Authors, based on research carried out in 2016.

In a period of five years we have seen the existence of about 388 published articles, and the lowest number of publications occurred in 2011, with 35 articles and the largest in 2014, with 89 articles.

For the year 2010, it was possible to identify some concern with human efficiency at work, occupational safety and occupational hazards, and some reviews of user x product interaction. In 2011, there was increased concern with work performance, posture assessments for the purpose of increased productivity (work). This year also tended to steering control assessments, information systems in vehicles as well as reviews of the management and safety when maneuvering simulators cars and large vehicles (Control, Information and Safety).

For the year 2012, the words Seat, Comfort, System and Task concern comfort seats and jobs, working conditions, musculoskeletal injuries from long periods of sitting posture, emergency systems and evacuation of personnel and finally tasks factors risk.

Since the year 2013 proved to be especially interested in the areas of cartography and geographic metadata. Usability, Information and User were used for studies involving access geographic data and the needs of users of these methods of information. Modeling was related to anthropometric models and interactive computer models. User was also associated with needs of clinics and hospital patients. In 2014, there was some interest in the topic thermal comfort, working firefighters and clothing designed specifically for this professional, as well as alarm and evacuation systems.

These studies used the keywords System, Human and Warning to describe these topics.

Finally, the year 2015 was marked by the appreciation of the Inclusive Design and user health at work and in schools, and more significant number of works emphasizing the participation of users in the process of product development. Moreover, it was found that some keywords followed certain trends and related to one another, possibly according to some annual trend.

4 Conclusions

Therefore, we find at the beginning of the reporting period, a large number of articles related to jobs and the worker's income, leaving the user, your comfort and satisfaction in the background, and focus the work on the production. We note that from 2012 issues related to health, users and focus on the human being begin to be protagonists in the polls. Arriving in 2015 with all the keywords most recurrent related to these issues, directly or indirectly.

Changes in the focus of research in design enhances interdisciplinary that this area of science has, in addition to showing an increasingly strong bond with ergonomics, as the number of published articles relating these areas is growing every year. The direction that research in design take, can show behavior patterns and reveal characteristics of a particular period, because this is an area within the applied social sciences, can reveal patterns of social behavior.

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