



OVERVIEW OF BRAZILIAN PUBLICATIONS AT THE 20TH INTERNATIONAL CONGRESS OF ERGONOMICS – THE RELEVANCE OF THE EXCHANGE BETWEEN SCIENTIFIC EFFORTS FOR ERGONOMICS

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Abstract

This study aimed to identify the contribution of Brazilian researchers in Ergonomics and Human Factors at the 20th Congress of the International Ergonomics Association (IEA 2018). For that, a bibliometric research was carried out in the 10 volumes of the congress' annals. A total of 108 studies were identified with at least one author linked to a Brazilian institution and a total of 281 researchers involved in the research. The thematic area with the largest number of publications (44) was "Ergonomics in Design, Design for All, Activity Theories for Work Analysis and Design, Affective Design". In addition, 73 studies made a practical contribution with focus on analysis. The physical approach was addressed by 48 studies, while cognitive by 32 and organizational by 39. Tracing an overview of Brazilian contributions on the international stage allows to identify the areas explored, the possibilities for exchange between existing and future scientific efforts.

Keywords: Ergonomics, Research, Brazil.

1. INTRODUCTION

Information is the key to scientific research, assuming a fundamental role for changes in the forms of work and technologies when combined with raw materials and capital (QUEIROZ ET AL., 2015). This fact is highlighted at the 20th Congress of the International Association of Ergonomics (IEA 2018), one of the main events in the area of Ergonomics and Human Factors, held in August 2018. This opportunity is the moment in which a large and diverse community of scientists and interested professionals in the field meet to exchange research results and good practices, discussing and identifying important issues about the state and future of the community (BAGNARA ET AL., 2018), as well as the present event.

In 2018, there were more than 1643 papers submitted to the IEA 2018, 1010 of which were selected, from 80 countries. Of these, almost half of the studies were from Europe and the

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rest from other continents, with Asia being the most numerous, followed by South America, North America, Oceania and Africa (BAGNARA ET AL., 2018). Brazil was represented by 108 works, being the most numerous among the countries of South America.

However, supposing that the knowledge derived from the verified information is devoid of problems and a greater need for investigation is not consistent with the reality of academic research (CHUEKE; AMATUCCI, 2015). Not least because the advancement of humanity imposes constant challenges to the field of scientific research. And the vision after the XX IEA reinforces this, the need for creativity to face the new challenges. When checking the published works, one perceives the atmosphere in which there are not many well-established certainties, but rather an abundance of doubts and open questions (BAGNARA ET AL., 2018).

To deal with these needs, researchers must rely on previous knowledge in order to achieve an advance in the process of generating new knowledge and, thus, foster the development of solutions and innovations relevant to the identified and constantly changing demands. And, to assist in this process, bibliometric studies are an important tool. Bibliometrics seeks to study the production of articles in a certain field of knowledge, mapping academic communities and identifying networks of researchers and their motivations (CHUEKE & AMATUCCI, 2015).

Believing in this relevance, this article aims to identify the contribution of Brazilian researchers in Ergonomics and Human Factors at the IEA 2018, based on the Annals of the event. It is understood that the papers published in this event offer a significant overview of the forms of study and practices of Ergonomics in Brazil and its analysis will elucidate important paths to be followed and possible partnerships to be made.

2. WORKING METHOD

The present study is characterized as a bibliometric study (MARCONI; LAKATOS, 2009), in which a research was carried out regarding the work of Brazilian researchers in the Annals of the 20th International Congress of Ergonomics (IEA 2018). The Annals of the event consist of 10 volumes, entitled Figure 1. The search criterion established was the country of the institution to which the authors are linked, regardless of the hierarchy of the same in the authorship of the work.

Figure 1: Themes of the Annals of the 20th International Congress of Ergonomics



| Vol. | Title | ISBN | No. Articles |
|------|--|------------------------|--------------|
| I | <i>Healthcare Ergonomics</i> | ISBN 978-3-319-96097-5 | 6 |
| II | <i>Safety and Health and Slips, Trips and Falls</i> | ISBN 978-3-319-96088-3 | 10 |
| III | <i>Musculoskeletal Disorders</i> | ISBN 978-3-319-96082-1 | 6 |
| IV | <i>Organizational Design and Management (ODAM), Professional Affairs, Forensic</i> | ISBN 978-3-319-96079-1 | 11 |
| V | <i>Human Simulation and Virtual Environments, Work with Computing Systems (WWCS), Process control</i> | ISBN 978-3-319-96076-0 | 3 |
| SAW | <i>Transport Ergonomics and Human Factors (TEHF), Aerospace Human Factors and Ergonomics</i> | ISBN 978-3-319-96073-9 | 6 |
| VII | <i>Ergonomics in Design, Design for All, Activity Theories for Work Analysis and Design, Affective Design</i> | ISBN 978-3-319-96070-8 | 44 |
| VIII | <i>Ergonomics and Human Factors In fashion</i> <i>Manufacturing, Agriculture, Building and Construction, Sustainable development and Mining</i> | ISBN 978-3-319-96067-8 | 17 |
| IX | <i>Aging, Gender and Work, Anthropometry, Ergonomics for Children and Educational Environments</i> | ISBN 978-3-319-96064-7 | 4 |
| X | <i>Auditory and Vocal Ergonomics, Visual Ergonomics, Psychophysiology In fashion</i> <i>Ergonomics, Ergonomics In fashion Advanced</i> | ISBN 978-3-319-96058-6 | 1 |



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The final result of the selection is found in a database composed of 108 articles (Appendix A) related to the thematic areas that give title to the volumes of the Annals. The articles described in the appendix are coded to facilitate their reference in the course of this work. These articles include Brazilian researchers regardless of the hierarchy of authorship. Thus, articles in which the first author is of another nationality were counted, as we believe that the exchange between institutions is also an indication of the way in which Brazilian researchers have positioned themselves within the area.

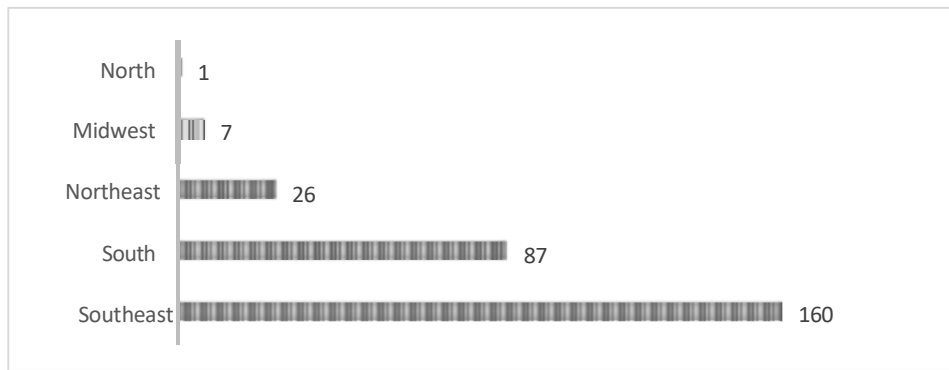
Thus, based on the information obtained in the selected articles, they were categorized into the following aspects: number of authors, institutions involved, graduate programs involved, sectors of application of the research, main contribution presented, among other relevant data for discussion.

3. FINDINGS

The 108 selected articles have 281 Brazilian researchers as authors. Six articles are authored by only one researcher (code 41, 50, 58, 62, 74, 79) and the article with the largest number of authors contains 15 researchers, all from the University of São Paulo (code 19).

Regarding the geographic distribution of these authors (Figure 2), considering the institution to which they are linked, there is a predominance of authors established in the Southeast Region (56.9%), with São Paulo being the state with the greatest contribution, with 76 researchers, followed by Rio de Janeiro, with 55 authors. The South Region (30.9%) occupies the second position, with Santa Catarina corresponding to 39 researchers. Next, Paraná with 33 authors and Rio Grande do Sul with 15 professionals. In the Northeast Region (9.3%), Pernambuco stands out, with 14 researchers, followed by Sergipe and Paraíba, both with 7 authors each. The Federal District is the state in the Midwest Region with the highest number of authors (5), followed by Mato Grosso do Sul with 2 participating researchers. The North Region had the participation of only one researcher/institution, who contributed with two works (codes 75 and 76).

Figure 2: Distribution of authors according to Regions of Brazil



The institutions to which the first author of each work belongs were counted. There were 47 different institutions among the 92 studies that correspond to the total number of studies with different first authors. Of these, the number of papers for each institution ranged from 8 to 1, with the Federal University of Rio de Janeiro occupying the first position (Table 1).

Thirty-two institutions had only one first author identified, and of these 5 are companies from different sectors (e.g., aviation and furniture industry), 2 represent industry and commerce institutions in the country (Social Service of Industry and National Service of Commercial Learning). In addition, international institutions were also identified, such as *the University of Lyon* (code 31, 60) and *the University of Guadalajara* (code 71). It should be noted that the international institutions identified represent articles that have Brazilian researchers, evidencing the presence of exchange between countries for research.

Table 1: Participating institutions according to first author

| Institution | No. First Authors |
|---|-------------------|
| Federal University of Rio de Janeiro | 8 |
| Federal University of Santa Catarina | 7 |
| University of São Paulo and Federal University of São Carlos | 6 |
| Santa Catarina State University | 5 |
| Pontifical Catholic University of Rio de Janeiro and University of Brasília | 4 |



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| University of Campinas, Federal University of Pernambuco, Federal University of Paraná and Federal University of Rio Grande do Sul | 3 |
| State University of Minas Gerais, Federal University of Minas Gerais, Federal University of Sergipe and <i>University of Lyon</i> | 2 |

The exchange between researchers and institutions is essential in order to promote the exchange of knowledge and experiences, enriching studies and work contexts. Thus, it was identified that 63 articles were developed by researchers from the same institution (58.3%), 29 studies were carried out through exchange between Brazilian institutions (26.9%) and 16 articles were developed in partnership between researchers from Brazilian and international institutions (14.8%). Table 2 illustrates which articles are referred to in each category.

Table 2: Participating institutions

| Category | No. Articles | Codes |
|---|--------------|---|
| Only one institution | 63 | 1, 2, 3, 4, 5, 6, 7, 9, 16, 17, 18, 19, 20, 22, 23, 25, 26, 28, 30, 32, 33, 36, 37, 39, 40, 41, 42, 43, 44, 45, 48, 50, 51, 52, 53, 54, 58, 59, 61, 62, 65, 66, 67, 70, 72, 73, 74, 77, 79, 80, 81, 82, 84, 86, 87, 88, 96, 99, 101, 104, 106, 107, 108 |
| Exchange between Institutions Brazilian | 29 | 8, 10, 11, 12, 13, 15, 24, 35, 38, 49, 55, 56, 57, 68, 69, 75, 76, 78, 83, 85, 89, 90, 91, 92, 93, 94, 97, 98, 105 |
| Exchange between Institutions Brazilian and International | 16 | 14, 21, 27, 29, 31, 34, 46, 47, 60, 63, 64, 71, 95, 100, 102, 103 |

The different thematic areas addressed in the 20th IEA, and which make up the 10 volumes of its Annals, are illustrated in Figure 1 (Research Method section). One of the areas with a significant number of articles above the others is noted: *Ergonomics in Design, Design*



for All, Activity Theories for Work Analysis and Design, Affective Design, with 44 articles (40.7%). Of these, nine works can be classified only as theoretical research, without the use of empirical data (codes 70, 76, 79, 81, 82, 88, 90, 102, 108). Four of these works are focused on the theme of Project and Product, together with a constant context in the works in this area, accessibility. In total, the theme of Project and Product is present in 20 articles in this area of the event.

Nascimento et al. (2018), sought to create a list of accessibility recommendations for designing graphical user interfaces for games based on Down Syndrome patients. Nakayama and Martins (2018) developed design guidelines that enhance and optimize the clothing design process with a focus on people with reduced mobility. Tavares et al. (2018) aimed to contribute to the improvement of studies on inclusive design aimed at people with cerebral palsy and, indirectly, other motor dysfunctions, identifying assistive technologies that facilitate computer access to this audience.

Using empirical data and with an applied intervention proposal, Azevedo et al. (2018) presented the development of a spirometer for use by visually impaired children in respiratory therapy care, focusing on its attractiveness to the child, simplification of use by physical therapists and low cost for institutions. The theme of accessibility is present in 13 works in this category of the event, and involves studies focused, for example, on the concern with design for elderly users (codes 70, 81, 91) and the analysis of built spaces with regard to the ease of movement of people with reduced mobility (codes 84, 85, 86, 89). Studies of other categories of the event were also concerned with design for elderly users, such as the code. 36, linked to the category *Aging, Gender and Work, Anthropometry, Ergonomics for Children and Educational Environments*.

Other analyses carried out in this bibliometric study were: (i) in relation to the theoretical, practical contribution involving ergonomic analysis or practical contribution involving ergonomic intervention; (ii) in relation to the physical, cognitive or organizational approach; (iii) sector of application of the studies. Table 3 presents the results of the information analyzed and it can be seen that most of the studies present a practical contribution, developing and applying tools and methods of ergonomic analysis and presenting recommendations for improvement in the sectors analyzed. However, only 10 studies deepen and discuss ergonomic interventions performed. Of these, two studies (codes 23 and 34) also explore the importance of cost analysis after ergonomic intervention.



Regarding the approach given to the studies, it is noted that 48 of them include a physical approach in their analyses (29 of which with a physical approach exclusively). The physical approach is concerned with biomechanical, anatomical, anthropometric, and physiological issues (IEA, 2018) and was a precursor in ergonomic studies. The cognitive approach, according to IEA (2018), is concerned with mental processes (such as perception, decision-making, memory) and 32 studies include this approach. Finally, the organizational approach focuses on the optimization of the sociotechnical system (IEA, 2018) and 39 include such an approach.

Among the sectors of application of the studies, the health sector stands out, involving studies in hospitals (code 3, 5, 19, 75, 89), with hippotherapy (code 23, 106), among others.

Table 3: contribution, approach and sector to the application of the studies analyzed

| Analysis | | No. Articles |
|---------------------|---|--------------|
| (i) contribution | Theoretical | 25 |
| | Practice – analysis | 73 |
| | Practice – intervention | 10 |
| (ii) approach | Physics | 29 |
| | Cognitive | 6 |
| | Organizational | 16 |
| | Physical – Cognitive – Organizational | 6 |
| | Physical – Organizational | 5 |
| | Physical – Cognitive | 8 |
| | Cognitive – Organizational | 12 |
| | Not applicable | 26 |
| | Not applicable | 19 |
| | Health | 11 |
| | Education | 7 |
| | Transport | 6 |
| | Slaughtering and meat processing, electric sector | 5 |
| | Agriculture, aviation, office, food sector | 4 |
| | Chemical industry, public sector | 3 |



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| (iii) Application sector | Building & Construction, Public Space, Sports, Automotive Industry, Furniture Industry, Electronics & Electronics, Fashion, Multiple Sectors, Recycling, Designers | 2 |
| | Constructiongas and oil platform, cosmetics industry, paper industry, packaging industry, judiciary, urban mobility, maritime navigation, prison, consulting service, aesthetic service, Servicecleaning, jewelry, telecommunications | 1 |

4. CONCLUSION

Scientific events are important milestones for the exchange of information and promotion of knowledge. The 20th Congress of the International Association of Ergonomics (IEA 2018) is an example, with 1010 studies published in 10 different thematic areas. The present study aimed to identify the contribution of Brazilian researchers and, through a bibliometric search, found 108 publications with at least one author linked to a Brazilian institution. Brazil was the South American country with the highest number of contributions.

The 108 publications were analyzed according to the thematic axis, number of authors, location of the authors' institutions (evidencing national and international partnerships), state of origin and institution of the first author, contribution of the study (theoretical, practical - analysis, practice - intervention), approach (physical, cognitive or organizational), sector of application. Drawing an overview of Brazilian contributions in the international scenario allows us to identify the areas explored, the possibilities of exchange between existing and future scientific efforts.

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APPENDIX

| Code • Arti go | Article Title | Quote |
|-------------------------|--|-----------------------------|
| 1 | Study on the Pause Effects During the Work Day in the Cardiovascular Load in the Line of Production of High Cadence With Heart Rate Assessment | Sweetheart Et al. (2018) |



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| 2 | Occupational Exposure to Agrochemicals: A Literature Review | Junqueira and Contrera (2018) |
| 3 | Effects of an Industrial Logic Implemented in Service Relation: The Case of Drivers of Ambulances of a Brazilian University Hospital | M Et al. (2018) |
| 4 | Perception of Working Conditions and Health by Prison Officers of a Male Prison from Brazil | Reinert et al. (2018) |
| 5 | Affective Appraisal of Hospital Reception Scenes | M Et Al. (2018) |
| 6 | Contributions of Activity Ergonomics to Design a Virtual Tool for Sharing Mental Health Care | Alonso et Al (2018) |
| 7 | The Relation of Visual-Digital Literacy in User Interaction with Mobile Devices | Carrion and Lent (2018) |
| 8 | Assessment of Occupational Vibration on Tire Track Harvesters in Forest Harvesting | Schettino et al. (2018) |
| 9 | The Influence of the Metabolism in the PMV Model from ISO 7730 (2005) | Avelino et al. (2018) |
| 10 | Perception of Pesticide Contamination Risk in Rural Workers with Low Schooling Level | Minette et al. (2018) |
| 11 | Stochastic Economic Viability Analysis of an Occupational Health and Safety Project | Miorando et al. (2018) |
| 12 | The Functional Resonance Analysis Method as a Debriefing Tool in Scenario-Based Training | Wachs Et Al. (2018) |
| 13 | Planning Simulation Exercises as Learning Lab: The Case of Digital Chart Changing Maritime Navigation Activity | Martins et al. (2018) |
| 14 | Ergonomics and Regulation: The Case of Job Rotation in a Brazilian Slaughterhouse | Messiah and Birth |



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| | | (2018) |
| 15 | The Safety-II Approach on Operational Maneuvers of the Hydropower Plant | Castle and Guimarães (2018) |
| 16 | Social Networks Applied to Zika and H1N1 Epidemics: A Systematic Review | Ahmad Et Al. (2018) |
| 17 | Ergonomic Analysis of Labor Applied to Scaffolders in a Shipyard in Brazil | Borges Et Al. (2018) |
| 18 | The Influence of Physiological Breaks and Work Organization on Musculoskeletal Pain Index of Slaughterhouse Workers | Martins et al. (2018) |
| 19 | Musculoskeletal Complaints in a Sample of Employees in a Tertiary Hospital: An Exploratory Preliminary Pilot Study | Fonseca et al. (2018) |
| 20 | Human Factors Related to the Use of Personal Computer: A Case Study | Reinert et al. (2018) |
| 21 | Capacity Index for Work, Psychosocial Risk of Work and Musculoskeletal Symptomatology in Workers of a Meat Processing Industry in Portugal | File Et al. (2018) |
| 22 | Analyses of Musculoskeletal Disorders Among Aesthetic Students Applying the Methods: REBA, Nordic and FSS | Raymundo and Rotta (2018) |
| 23 | Equotherapy Center at a Glance for Ergonomic Activity: Epidemiological Profile Versus Therapeutical Practices | M. D. Boaretto et al. (2018) |
| 24 | The Need to Present Actual Costs After an Ergonomic Intervention | Scallop Et Al. (2018) |
| 25 | Challenges of Telework in Brazil: A Sociotechnical Analysis | Godoy and Ferreira (2018) |



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| 26 | Collaborative Design Methods and Macroergonomics as Organizational Tools for Distance Education's Design Teams | Boechat nd Mont'Alvão (2018) |
| 27 | Building Tools to Guarantee a 'Common Ground' Building Tools to Guarantee a 'Common Ground' | Saints nd Alvarez (2018) |
| 28 | Virtual Simulations for Incorporating Ergonomics into Design Projects: Opportunities and Limitations of Different Media and Approaches | Paravizo nd Braatz (2018) |
| 29 | From Diagnosis and Recommendation I'm the Formative Intervention: Contributions of the Change Laboratory | Vilela Et Al. (2018) |
| 30 | New Public Management, Performance Measurement, and Reconfiguration of Work in the Public Sector | Kawasaki et al. (2018) |
| 31 | Simulating Work Systems: Anticipation or Development of Experiences. AnActivity Approach | Béguin et Al. (2018) |
| 32 | Work Macroergonomics Analysis (AMT Method): Identification of Ergonomic Demands in Sewing Laboratory | Debastiani nd Silva Et al. (2018) |
| 33 | Accounting Standard for Ergonomics: Relation of Ergonomics and Accounting | Scallop Et Al. (2018) |
| 34 | The BRICSplus Network: A Historical Overview and Future Perspectives of the Network's Role in Human Factors and Ergonomics | Davy Et al. (2018) |
| 35 | Impact of Exercise and Ergonomics on the Perception of Fatigue in Workers: A Pilot Study | Pinetti Et Al. (2018) |
| 36 | Aging and Hand Functions Declining: Assistive Technology Devices for Assistance in Daily Life Activities Performance | Giordani nd Cinelli (2018) |

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| 37 | Facets of the Precariousness of Women's Work: Outsourcing and Informal Activity | Cardillo et al. (2018) |
| 38 | SOOMA - Software Is Acquisition and Storage of Anthropometric Data Automatically Extracted from 3D Digital Human Models | Pastura et al. (2018) |
| 39 | Employing Game Engines for Ergonomics Analysis, Design and Education | Paravizo ^a and Braatz (2018) |
| 40 | Playing for Real: An Exploratory Analysis of Professional Esports Athletes' Work | Paravizo ^a and Souza (2018) |
| 41 | Usability in Electronic Judicial Process | Chaves (2018) |
| 42 | Air Travel Accessibility: Interaction Between Different Social Actors | Souza Et Al. (2018) |
| 43 | Ergonomic Approach of the Influence of Materials and the User Experience in the Interior of Automobiles | Brook ^a and Camâra (2018) |
| 44 | The Mobility in Belo Horizonte Through the Macroergonomics and Service Design | Botelho et al. (2018) |
| 45 | The Quality of Roads in Brazil: The Interrelation of Its Multiple Stressors and Their Impact on Society | Botelho et al. (2018) |
| 46 | Seat Comfort Evaluation Using Face Recognition Technology | Ciaccia et al. (2018) |
| 47 | Ergonomics and Crisis Intervention in Aviation Accident Investigation | Aslanides et al. (2018) |
| 48 | The Ergonomics of the "Seated Worker": Comparison Between Postures Adopted in Conventional and Sit-Stand Chairs in Slaughterhouses | Days Et al. (2018) |
| 49 | Epidemiological Survey of Occupational Accidents: A Case Study in the Flour and Animal Feed Business | Provin ^a and Cantele (2018) |
| 50 | An Ergonomic Program in a Chemical Plant of Rhodia/Solvay in Brazil | Azevedo (2018) |



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| 51 | Ergonomic Analysis on the Assembly Line of Home Appliance Company | Wagner et al. (2018) |
| 52 | Ergonomics Management Program: Model and Results | Varella ^a and Trindade (2018) |
| 53 | Risk Assessment of Repetitive Movements of the Upper Limbs in a Chicken Slaughterhouse | Kings Et Al. (2018) |
| 54 | The Work of the Agricultural Pilot from an Ergonomic Perspective | Would Et Al. (2018) |
| 55 | An Application of Ergonomics in Workstation Design in Office | Coast ^a and Villarouco (2018) |
| 56 | Ergonomic Analysis of Secondary School Classrooms, a Qualitative Comparison of Schools in Naples and Recife | Sarmiento et al. (2018) |
| 57 | Prototyping a Learning Environment, an Application of the Techniques of Design Science Research and Ergonomics of the Built Environment | Sarmiento et al. (2018) |
| 58 | The Particular View: The User's Environmental Perception in Architectural Design | Pinto (2018) |
| 59 | Ergonomics and Technologies in Waste Sorting: Usage and Appropriation in a Recyclable Waste Collectors Cooperative | Souza Et Al. (2018) |
| 60 | Work, Innovation and Sustained Development | Valérie et al. (2018) |
| 61 | The Trucks as the Main Tool in the Cargo Transport in Brazil: The Driver's Health Impacts and the Sustainable Developments | Botelho et al. (2018) |
| 62 | Analysis of Ergonomics in the Reuse and Recycling of Solid Materials in Brazilian Cooperatives | Silva (2018) |
| 63 | Work Activity as a Social Factor of Metropolis Sustainable Development: Case of a Non-profit Organization in St. Petersburg (Russia) | Volosiuk et al. (2018) |



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| 64 | When Creativity Meets Value Creation. A Case Study on Daytime Cleaning | Gasparo et al. (2018) |
| 65 | An Analysis of Usability Issues on Fashion M-commerce Websites' Product Page | Bozzi ^a and Mont'Alvão (2018) |
| 66 | Ergonomics of Design - Problems in Making the Project a Reality | Oliveira et al. (2018) |
| 67 | The Factors that Influence Productivity During the Activity of Lining in Small Vertical Buildings in Brazil - A Case Study | Avelino et al. (2018) |
| 68 | Human Factors and Ergonomics Design Principles and Guidelines: Helping Designers to Be More Creative | Souto and Fadel (2018) |
| 69 | Application of the Equid Methodology and the Principles of Macro Ergonomics in Seat Design | Cantele ^a and Nonemacher (2018) |
| 70 | Ergonomics of the Built Environment: Main Methodologies Used in Brazil and the Most Adequate Ones to Evaluate the Interaction Between the Elderly and Built Environment | Arruda Koehler et al. (2018) |
| 71 | Evaluation of Usability of Two Therapeutic Ultrasound Equipment | Castro-Luna et al. (2018) |
| 72 | Designing Solutions for Healthcare System Problems - LUFT Incentive Spirometer: Study of Case | Azevedo et al. (2018) |
| 73 | Integrating Ergonomics into Product Design Through the UCD Approach | Reinert ^a and Gontijo (2018) |
| 74 | Interior Design Adequacy of Truck Sleeper Cabins in Brazil as to the Use as Temporary Dwelling | Mello (2018) |
| 75 | Ergonomics of a Children's Day Hospital | Ferrer ^a and Villarouco (2018) |



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| 76 | Cognitive Ergonomics in Architecture: Creativity and Ambience in Children's Healthcare Spaces | Ferrer nd Villarouco (2018) | a |
| 77 | Functional Fashion and Co-creation for People with Disabilities | Brogin nd Okimoto (2018) | a |
| 78 | Developing a Framework for a Participatory Ergonomics Design Processes: The MPEC Method | Braatz Et Al. (2018) | |
| 79 | Systemic Body: Ergonomics of the Prevention | G. Victor (2018) | |
| 80 | The Role of Design in Use in Agriculture: The Case of Brazilian Crops | Narimoto nd Belussi (2018) | a |
| 81 | Cities and Population Aging: A Literature Review | Oliveira et al. (2018) | |
| 82 | Analysis of Methods for Evaluation of Assistive Technologies Focused on Computational Access of People with Cerebral Palsy | Tavares et al. (2018) | |
| 83 | Ergonomics in the Built Environment: Survey of the Factors Related to the Corporate Work Environment Linked to Activities of High Concentration | Cantele nd Nonemacher (2018) | a |
| 84 | Ergonomic Accessibility Assessment in Mixed-Use Buildings | Calvet nd Abrahão (2018) | a |
| 85 | Accessibility at University Campus in Historical Center | Almeida et al. (2018) | |
| 86 | Antonio Franco Market: Case Study on Accessibility in Public Buildings | Santana et al. (2018) | |
| 87 | Information for Tactile Reading: A Study of Tactile Ergonomics of Packaging for Blind People | Ribeiro et al. (2018) | |



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| 88 | Fashion Design Methodology Tools in Products' Development for People with Disabilities and Low Mobility | Nakayama and Martins (2018) |
| 89 | Look with the Eyes of Others: Accessibility in Hospital Environments | Silva e Costa (2018) |
| 90 | Recommendations for the Development of Accessible Games for People with Down Syndrome | Birth et al. (2018) |
| 91 | Passengers with Disabilities, Elderly and Obese in Brazilian Air Transportation: Contradictions in the Activity Systems | Silva Et Al. (2018) |
| 92 | Ergonomic and Psychosocial Aspects of Electrical Energy Maintenance Activities on Transmission Lines | Gemma et al. (2018) |
| 93 | From Micro to Macro Dimension: An Inverted Way to Think Solution in Designs | Resende et al. (2018) |
| 94 | Design as a Reflection of User Experience | Resende et al. (2018) |
| 95 | Building a Dialogical Interface: A Contribution of Ergonomic Work Analysis to the Design Process | Lipovaya et al. (2018) |
| 96 | The Real Richness in the Semi-jewel Production | Bezerra Gemma e Silva (2018) |
| 97 | Developing a Methodology for a Participatory Ergonomics Evaluation Process: Human Performance and Productivity Cycle | Mazzoni et al. (2018) |
| 98 | Conceptual Principles as Intermediary Object: Case of an Industrial Unit | Resende et al. (2018) |
| 99 | Ergonomics and Architectural Programming: The Possible Articulation? | Rock and Abrahão (2018) |
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