

The Current Trends in Ergonomics

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Brief Background

Ergonomics is a multidisciplinary field incorporating contributions from psychology, engineering, biomechanics, mechanobiology, industrial design, physiology and anthropometry. It comes into everything which involves people and technology and largely concerns physical and cognitive interactions between people and their respective creations. The International Ergonomics Association (IEA) defines ergonomics as follows [1]:

Ergonomics is commonly practiced in terms of how companies design tasks and work areas to maximize the efficiency and quality of their work. Helander et al. [2] specified three important targets for ergonomics design activity to improve: 1) safety 2) productivity; and 3) operator satisfaction.

However, the targets for ergonomics design are constantly evolved and what Helander stated now more than fifteen years ago may already seem outdated to many, yet unattainable to others. As ergonomics continues to gain powers throughout industry, many occupations are involved with ergonomics. This includes engineers, physical therapists, nurses, doctors, psychiatrists, architects, chiropractors, etc. It is important to avoid being prejudiced towards any occupation that is practicing ergonomics as they all add value in their unique way. Improving workplace safety and performance, ergonomics continues to be a major issue for employers and a key element of most environment, safety and health programs.

Current Developments and Emerging Areas

Ergonomics has focused on improving interactions amongst people, tasks, environments, and products. According to the definition and the practice, ergonomics is a natural part of the public health and occupational medicine. Ergonomics is often viewed as a specific auxiliary health profession with its own specific research methods Jensen et al. [3] Healthcare ergonomics is the fastest growing ergonomics field nowadays. The healthcare industry is scrambling to reduce errors and design systems that function like a lean manufacturing assembly line. Healthcare companies are motivated to improving such as time studies, programming usability focused software, and arranging on patient handling and moving. Even psychologists are getting more into the field of ergonomics. The social environment has a huge impact in people reporting pain. For example, in one area of a plant or factory, employees can be going frequently to a doctor that is diagnosing them with muscular skeletal disorders (MSDs) and/or repetitive motion injuries and disorders (RMDs). In another part of the same plant or factory, the employees doing the same work can report having no pain. This is mainly because they are happy employees. Everything is inter-related in ergonomics, including psychology.

The application of ergonomics principles can particularly improve health, safety, and quality of life of older people. Improving the health and quality of life of the older people requires that the knowledge of aging be applied to the design of products and environments. In today's health care and work environments, for example, the ability to use technology is a critical skill. Technology can greatly improve the well-being and quality of life of the older adults, and studies

indicate that the older people are receptive to using new technologies. However, they often encounter difficulties because they receive inappropriate training or because designers of the technology have not taken into consideration the needs of older people. User-testing and user-centered designs are critical to the success of technical systems. However, we currently very little know about the efficacy of design aids and supporting tools for the older adults. We need more information on the best way to train the older adults to use new technologies. There are also many unanswered questions about the best designs of online training programs and multimedia formats.

Issues of privacy and trust in technology are critical areas for research in ergonomics. There are many problems about the internet, such as how access to internet information impacts health care behavior and how we can teach seniors to identify and integrate relevant information from the enormous amount of information available on the internet. In the workplace, research on how technology impacts employment opportunities and the work performance of older people and workers would be extremely helpful. Not much research has been done on telework as it relates to older people or the factors that influence technology adoption, especially for minority elderly people and people who are not highly educated or well off economically.

Another area to require research would be that many questions related to quality of life and socialization are not fully explored. Many of the needs for the older people could be addressed, or partly addressed through technological solutions. However, we will first need a systematic effort to understand their needs and incorporate them into the design of products for the marketplace.

Addressing the causes and consequences of environmental degradation seems to present other significant challenges for ergonomists. This means that ergonomics professionals can also contribute to understanding and tackling some of the issues that arise through the movement towards a more environmentally sustainable economy. These issues are considered in relation to work in green industries such as sustainable energy production, recycling and organic food production. There is a need to ensure that these industries and works are safe and healthy; the design of products and systems that are 'environmentally friendly' to facilitate their acceptability and use; and how ergonomics professionals can contribute to understand and promote behavioral changes relating to environmental choices.

Conclusions

Ergonomics has significantly contributed to the design

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improvements for all kinds of systems with people, work systems, and product/service systems over the last 30 years and will continue to demonstrate its value more successfully to the industry stakeholders. The future for ergonomics and ergonomists will require development of wide-based skills that will include strong technical and research competencies. It is also considered what's needed to succeed in ergonomics is education, credentials, experience, professional certifications, affiliation with professional groups, and continued training and development. The needs and opportunities for further research discussed here are expected to be amongst the more important challenges to the ergonomics community for the immediate future.

This would require holistic approaches to achieve successful outcomes to the benefit of all the stakeholders.

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