

Intervention on The reality of the application of ergonomics - an exploratory study on employees with special needs in the Laghouat region -

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Abstract:

The current study aimed at applying ergonomics to employees with special needs in the Laghouat region. To address the literary references and the intellectual framework of the concept of ergonomics as a topic that is increasingly interested in it by thinkers and academic researchers in the field of organizational life in particular and the field of social life in general. We started our topic by addressing the concept of ergonomics through some intellectual orientations, to move to identify its origins, then its goals, types, and areas of ergonomic intervention, to finally reach to identify its applications. The results of the interview conducted on a sample of employees also resulted that institutions care about the physical conditions of workers with special needs in the Laghouat region and take into account their health conditions by adapting them to their work environment through ventilation, humidity, heat, and even their lives and psychological and social interactions with their colleagues, especially and Society at large.

Keywords:

Keywords:ergonomics; people with special needs.

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1. INTRODUCTION

The relationship of the individual with his work environment is a relationship of influence and impact, if the physical environment is inappropriate, its impact will be negative of course, and the most important thing it represents is the physical health of the worker, as it is accompanied by exposure to various risks, some of which lead to the occurrence of occupational diseases that are directly related to the factors of the physical environment and the intensity of daily exposure to them such as temperature, humidity, inhalation of dust or gases... In this regard, we find that the latest statistics of the International Program on Chemical Safety of the World Health Organization showed that more than 4 million people across the world die from occupational diseases, compared to 8 million people who die from work accidents due to exposure to chemical, physical or biological elements while practicing work activities, those who suffer from respiratory and skin diseases or disorders Skeletal muscle or occupational cancer The category of people with special needs as an integral part of society has the same negative effects that it faces during its career.

So what is the reality of applying ergonomics to employees with special needs in the Laghouat region?

Objectives of the study:

- Identify the concept of ergonomics
- Identify the genesis of ergonomics
- Identify the goals of ergonomics
- Identify the types of ergonomics
- Identify areas of ergonomic intervention
- Learn about ergonomic applications
- Identify the concept of people with special needs

Study Methodology:

The descriptive analytical approach was relied upon as the most appropriate to describe the phenomenon under study and analyze the data

surveyed from the lived reality and through the nature of our exploratory study, which expresses an investigation of the course of events of the phenomenon under the current study, we have relied on the interview form technique as a tool for data collection and then we analyzed the data to draw conclusions.

Theoretical framework of the study:


2. The concept of ergonomics:


2.1 Definition of ergonomics:

The word ergonomics comes from the Greek word, a composite of "ergon" and "noms", the rules of any set of rules that govern labor activities.

Definition of the encyclopedia "Universalis	Ergonomics is the study of the relationship between man and machine in order to reach the best adaptation between them
Wisner's definition of 1988	Ergonomics is the body of scientific knowledge related to man, which is necessary for the development of means of work, machines and various arrangements that he can use in the best way and effectiveness (Muslim, 2007, p. 104
Definition of the International Ergonomics Association (IEA)	Ergonomics is a scientific study of human factors in relation to the work environment and the design of products and equipment
Encyclopedia Compton	It is to ensure that the machinery, equipment, tools and furniture related to the performance of a task or function are suitable for the workers who perform this work or task, which is a scope of engineering sciences called ergonomics, or human

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	<p>engineering, with the aim of reducing effort, and increasing the safety of the worker during the performance of his work</p>
<p>Chapanis 1985 (Chapanis, 1985)</p>	<p>It is considered one of the most comprehensive and expressive definitions of the actual reality of ergonomics, as it is seen that ergonomics : (collects information about human behavior, capabilities, limits and other characteristics that are used in the design of objects, machines, systems, tasks, works and surroundings to obtain a safe, comfortable and effective design</p>
<p>ILO definition</p>	<p>Human engineering has been defined as the application of biological sciences and humanities in relation to technical sciences in order to reach the best mutual application between man, his work and its results measured by indicators of efficiency and health safety of man. It is noted from this definition that it focuses on the fact that human engineering is a multifaceted concept, through</p>

	<p>which the knowledge, concepts and scientific information provided by other biological sciences can be used in the applications of industrial human engineering</p>
<p>Human engineering is defined according to the British standard definition</p> 	<p>It is the relationship between man and his profession, his equipment, and his environment in particular the application of psychological, physiological, and anatomical knowledge to the problems of this relationship." In fact, the adaptation of machines and work sites to human characteristics and anthropometric dimensions has its main justifications, due to the inability of humans to use these machines efficiently if they are not suitable for their abilities and characteristics (najm, 2014, pp. 221-222) .</p>

Source: Prepared by the researcher based on literary references

2.2Genesis of ergonomics:

The emergence and development of any science or field is affected by intellectual currents and environmental, social and economic requirements, and this is what made ergonomics affected by the aforementioned factor in its origin and development through sequential time stages. Most historians agree that ergonomics appeared with the beginning of human thinking in designing the means, methods and machines of work to be suitable with its capabilities and capabilities and to achieve comfort, tranquility and security, and the historical origins of ergonomics can be traced in the following four

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stages:

❖ Pre-World War II stage: At this stage, the ergonomic studies were weak, predominantly of the nature of non-systematic and uncontrolled partial studies, but they contributed greatly to the formation of a solid basis for ergonomics. The study of motion and time by Taylor and Gilberth · The emergence of tests by Benneth, Spearman and others. · Activities of the Health Research Council in industry. · The emergence of the experimental psychology of cognition, learning and remembering. · Formation of the so-called Industrial Fatigue Know-How Council. In the year (1920) appeared the National Institute of Industrial Psychology, which had cooperation with the Research Council in industrial fatigue, the latter, which was called in (1929) the name of the Council for Research in Industrial Health, but it appeared a period of recession in (1930) and less interest in the study of human performance, and this is due to the large unemployment and the availability of labor, and neglect the principle of putting the right man in the right place.

❖ World War II stage: This stage was the driving force of ergonomics, as the requirements of the war and the conditions it left behind are among the most important reasons that prompted researchers to study and analyze war accidents and significant losses in lives and equipment and the ineffectiveness of war, although the soldiers were well chosen and well trained, and as a conclusion they found that the causes of accidents are not due to soldiers, but to the design of machines and equipment, and the researchers have reached two conclusions:

- Cases in which machines required higher energies than human energies and capabilities.

- Cases in which machines were below the level of human capabilities, capabilities and limits

❖ These results were the strong reason for the crystallization of ergonomics and pushing it forward and giving ergonomics great scientific value.

❖ Post-World War II stage: At this stage and until the end of the sixties

of the twentieth century, the scope of ergonomics expanded and did not remain confined to the military field, including industry, especially in the United States of America, in order to speed up the industry and get out of the remnants of World War II, and to achieve security, comfort and effectiveness in the field of industry to develop ergonomics amazingly. The appearance of the term ergonomics for the first time on 07-12-1949 during a meeting that included a team of English researchers, and the British psychologist "Murell" is the first to propose this term and on 16-02-1950 it was approved and adopted to cover the various activities that researchers were doing in order to find an optimal adaptation to work with humans.

❖ Inlusiveness and universality stage: This stage started from the seventies of the twentieth century to the present day, and was characterized by two basic characteristics

✓ Comprehensiveness: Because ergonomics did not remain confined to the industrial aspect only, but included all fields and areas of life: agriculture, trade, health, home Etcetera.

✓ Universality: Because ergonomics moved from the United States of America and Europe to developing countries through cultural exchange to developing countries through cultural exchange, scientific cooperation, technology transfer, and despite laboratory equipment and capabilities, many ergonomics from developing countries were able to carry out very important studies and researches that had a great credit for the development and expansion of ergonomic research.

2.3 Objectives of ergonomics:

The basic objectives of ergonomics can be summarized as follows:

✓ Improving comfort indicators, providing security and safety, preventing accidents and eliminating occupational diseases within the work environment.

✓ Helping to facilitate technological change, as each change has resulted in resistance for fear of not adapting to it, so one of the objectives of ergonomics is to prepare technical and technical workers to overcome this obstacle in order to adapt them to the new requirements. . (Muhammad, 2007, p. 113)

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✓ Making the work environment consistent with the needs, abilities and preparations of man in order to achieve maximum comfort in work on the basis of his basic needs as a biological - psychological - social being with anthropometric dimensions.

✓ Organizing the work environment in accordance with the principles, rules and concepts of human engineering, which leads to increasing the effectiveness of the worker by improving his work methods, reducing the production process and improving the process of designing and organizing work sites and their basic component and their suitability to the capabilities and capabilities of the worker. (najm, 2014, pp. 228-229) .

✓ Study the appropriate physical conditions for work such as: noise, heat, lighting and the resulting occupational hazards and diseases (Mohammed, 2010, p. 221)

2.4 Types of ergonomics:

Classical ergonomics: It was called the relational view of its interest in the relationship between man and machine, as it focused primarily on the means of display and monitoring tools, and one of its most important contributions related to the improvement of the practitioners (disks), measuring devices and control buttons, and its view went beyond the comprehensive design of the field of work from the design of seats, tables and machines. The orientation of the classical ergonomic research was focused on military applications such as aircraft control devices (radar), and missile orientation, until this trend changed later to the civil application such as the design of industrial machines such as cars, home and office furniture such as automatic washing machines, etc., and despite the high quality of these studies and their academic nature, they were limited in effectiveness because most of their research was primarily laboratory, as its results could not be generalized in most cases. Complexity, and this is what made the classic offering unconvincing.

- Argonomic formats:

The various problems and difficulties faced by classical ergonomics have led to the emergence of the so-called argonomics of formats, which

see that individuals and machines form one format and therefore must develop and develop the capabilities and capabilities of the parties (man and machine) because they work in the end to achieve one goal, and from this point of view, the ergonomics of the formats are concerned with the format starting from the early stages of design, through the identification of goals and tasks that in turn achieve the final goals of any format and then distribute the tasks of the format between Individuals on the one hand and machines on the other, on the basis of the Dora and the cessation of each of them in order to achieve the objectives, and the specialist in the ergonomics of the formats develops and develops the partial formats of the total system in question, and this is achieved by:

- **Task analysis:** i.e. analysis of tasks that achieve the final process of the format

- Work description: any definition and determination of the way in which the work is performed during the stages of work.

The method of using the format, dealing with its various components, arranging the stages of use, in addition to the methods and techniques of selection and training, is one of the main tasks of the specialist in ergonomics of formats, which are basic stages without which he cannot perform his function to the fullest, and despite all this, the trend of aronomics did not last long, but did not reach the desired goals due to:

- Lack of accurate arbitrators in the distribution of tasks and operations between individuals and machines

- The intervention of ergonomics (the researcher belonging to the ergonomic system) in the reorganization and development of pre-existing micro-systems, which is seen by the man of the field as a process that directly threatens human patterns and thus rejects resistance.

- **Ergonomia error:** According to the belief of the proponents of this view, the failure of the system to perform its tasks is mainly due to human error, regardless of the type of format, even if it is completely possible, and on this basis the causes of the defect can be traced and found in one of the stages of the development of the system, either in the stages of design or the stages of installation. (Mbarki, 2004, pp. 05-38) .

2.5 Ergonomic intervention areas:

Ergonomic intervention differentiates between the following areas:

- ✓ First Field: Physical Ergonomics
- ✓ Second Area: Regulatory Ergonomics
- ✓ The third field: mental ergonomics "cognitive"

"Ergonomie physique" Physical ergonomics " Design:

Physical ergonomics refers to all interventions at the level of the physical environment of work that characterize the technical specificities of the format, and may include or concern all work environments such as: noise, dust, lighting, arrangement of temporal or spatial work atrocities.

It is also concerned with the physiological specificities and physical lengths of the worker in his relations with various activities, so it is concerned with work positions, control of means of work and how to use them, as well as repetitive movements, and musculoskeletal disorders.

(Muhammad, 2007, p. 117) .

"Ergonomie organisationnelle": Organizational ergonomics is very concerned with rationalizing socio-technical patterns, by paying attention to the organizational structure, work rules and various procedures, and one of its most important interests is also communication and collective incoming management, and the design of various new forms of work within the framework of the interaction of all these factors.

"Ergonomie cognitive": This trend has been called cognitive ergonomics because it involves all the mental activities at work, from perception to understanding to response, and the extent to which all these data interact with the machine. Cognitive ergonomics is related to intellectual functions, as it considers the human being as a unit that is processed within the data set, and it is also concerned with various mental processes such as: perception, memory, logical reasoning and motor responses, and the effects of all this on interactions between humans and the rest of the components of the system.

(Muhammad, 2007, p. 124)

2.6 Ergonomics Applications:

There are many applications of human engineering within many

fields, including the following:

-Aviation and space systems: Human engineering is applied in the design, development, operation and maintenance of navigation systems in the aviation, space, civil and military fields

-Environmental design: Human engineering intervenes mainly in the design of different environments architecturally and internally in work, office and home in order to design work

-Computer systems: Human engineering intervenes in human-computer interaction systems, especially in the field of designing communication interfaces, data processing, designing computer programs

-Communications: It studies all related to human-human communication methods, as it includes all different communication media technologies, including multimedia communications, information services, applications of fast communication networks, and the applications of these communications in the field of education machinery, medicine, raising productivity and quality of life for individuals.

-Aging: The fields of human engineering are suitable in order to cover the needs of the elderly and provide them with many facilities in their daily lives

-Consumer products: Develop products so that they are useful and usable safely and desirable

-Educational professions: Training and development of specialists in the field of human factors in industrial, academic and governmental institutions, focusing on granting certificates in human engineering and continuous development of skills and those wishing to pursue training and obtaining knowledge in the field of human engineering

-Medical systems and people with special needs: Human engineering works in raising the level of health and improving treatment systems, medical devices and the quality of daily life, especially for people with special needs

-Individual differences: Human engineering takes into account differences between individuals, which affect productivity in general

-Safety: Many studies and researches are conducted on the areas of the impact of human engineering on safety and injury reduction in all aspects of

life, whether at work, transportation, offices, public service places, entertainment places or home.

3 Field side of the study:

3.1 Spatial and temporal scope of the exploratory study:

4 employees with special needs were interviewed during the period from 02 June 2023 to 05 June 2023 with workers from various directorates in the wilaya of Laghouat, Algeria.

3.2 Study Sample:

People with special needs:

They are people who need special treatment to be able to absorb what is going on around them, because they have a type of disability that hinders their ability to adapt to things as they are healthy people, and these people cannot learn in regular schools, but they need special tools and special methods commensurate with their abilities and people with special needs suffer from disabilities, including hearing or visual, and developmental retardation Mental illness that may cause slow learning, behavioral disorders, psychological disabilities, language disorders and other injuries, the disabled are listed as a category of people with special needs.

3.3 Interviews.

First interview:

-Age 34 years

Gender Male

-Nature of work Computer Technician:

Is ventilation appropriate in the workplace? Yes

-Does the level of airflow affect your comfort at work?

Sometimes

-Does high temperature affect your breathing?

Sometimes when the temperature rises due to the region

-Do you have cooling equipment in your workplace?

Yes, refrigeration devices are available

-Is the temperature not suitable in winter no Does humidity cause you allergies?

There is no humidity in my workplace

-Do you have air purifiers available in your workplace from dust particles and suspended bacteria?

Yes, but sometimes I face breathing difficulties outside my workplace due to the nature of the area

-Do you find it difficult to communicate with other employees?

There are no ones who accept my work and there are those who treat me with kindness

-Does the Foundation provide suitable conditions for your disability?

Yes, the institution provides suitable conditions so that I do not find it difficult to climb the stairs or move between offices, as my work site is on the ground floor.

Second interview:

-Age

42 years

-Gender Female

The nature of the work is a cleaner

-Is ventilation appropriate in the workplace?

Yes

-Does the level of airflow affect your comfort at work?

No

-Does high temperature affect your breathing?

All the time

-Do you have cooling equipment in your workplace?

Yes, available.

-Is the temperature not suitable in winter, not because the city has a suitable atmosphere?

-Does humidity cause you allergies?

There is no humidity in my workplace

-Do you have air purifiers available in your workplace from dust particles and suspended bacteria?

No, because my job is cleaning, and this often makes me difficult to breathe if I don't wear masks.

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-Do you find it difficult to communicate with other employees?

No, most of them pity me.

-Does the Foundation provide suitable conditions for your disability?

Yes, the institution provides suitable conditions.

Third interview:

-Age 52 years

-Gender Male

-Nature of work Educational Supervisor

-Is ventilation appropriate in the workplace?

Yes

-Does the level of airflow affect your comfort at work?

No

-Does high temperature affect your breathing?

No

-Do you have cooling equipment in your workplace?

Yes, refrigeration devices are available

Is the temperature not suitable in winter no

-Does humidity cause you allergies?

There is no humidity in my workplace

-Do you have air purifiers available in your workplace from dust particles and suspended bacteria?

No because of the educational institution and the majority of my work with the students

Do you find it difficult to communicate with other employees?

No, everyone respects me.

Does the Foundation provide suitable conditions for your disability?

Yes, but dealing with students sometimes doesn't exhaust me.

Fourth interview:

-Age 27 years

-Gender Male

-Nature of work guard

-Is ventilation appropriate in the workplace?

Yes

-Does the level of airflow affect your comfort at work?

No

-Does high temperature affect your breathing?

Sometimes when the temperature rises due to the region

-Do you have cooling equipment in your workplace?

Yes, refrigeration devices are available

-Is the temperature not suitable in winter no

-Does humidity cause you allergies?

There is no humidity in my workplace

-Do you have air purifiers available in your workplace from dust particles and suspended bacteria?

No

-Do you find it difficult to communicate with other employees?

I don't have friends who love me.

-Does the Foundation provide suitable conditions for your disability?

Yes, the institution provides suitable conditions

3.4 Analysis and discussion of results:

The results show that working individuals of different ages between 27 years and 52 years and their various jobs state that ventilation is appropriate in their workplace, which indicates the interest and consideration of institutions next to ventilation, which makes it easier for workers to carry out their work. The high temperature relative to the geographical location of the region, but the institutions have cooling devices that soften the atmosphere and facilitate their work.

The results also showed that there is no humidity and that the weather is suitable and pleasant during the winter.

As for air purifiers, most of the respondents stated that their institutions have these devices, the institution, according to the respondents' statements, prepares them with the appropriate place for the conditions of their disability. The results also show that most workers with special needs make friends and acquaintances in their workplace by virtue of our Muslim community, which supports non-discrimination between people, as the Agwati community is

one of the solidarity, friendly, and united societies, and this is what appears through the statements of the respondents.

3.5 General Conclusion:

Through our general conclusion of our survey that institutions apply ergonomics automatically, this indicates that institutions care about their employees and pay great attention to providing a suitable work environment and taking into account ventilation, temperature and attention to humidity in appropriate working conditions.

Thus, it applies the basics of ergonomics and takes care of its employees in all their differences, whether ordinary or with special needs.

Conclusion:

The category of people with special needs is one of the societal segment that must be taken into account and taken care of by all official actors such as governmental or informal institutions such as associations, through concerted efforts, this category will become a strong source of production and creativity, as well as change for the better, given the progress that we see today, we find that they are also changing and keeping pace with developments and affecting and affected, and the best example of this is the emergence of the people of determination.

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