



**THE INFLUENCE OF NEUROARCHITECTURE IN THE RELATIONSHIP OF SPACES
WITH THE HEALTH OF TEACHERS**

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ARTICLE INFO

Article History:

Received 15th January, 2022

Received in revised form 7th

February, 2022

Accepted 13th March, 2022

Published online 28th April, 2022

Key words:

Neuroarchitecture. Ergonomics. Apprenticeship

ABSTRACT

The present work presented characteristics and particularities of neuroarchitecture and its influence on the teachers' work spaces. It approached the corporate architecture about a new perspective, where intelligent and more humanized spaces meet the physical and physiological needs of users, taking into account the human being and the impact of a work environment on people's brains and consequently on emotions. The research aimed to identify and analyze the aspects related to the treatments given to the environments and how they can be valued in this area of activity, as well as to demonstrate the efficiency of this approach in the search for an evolution in the quality of teaching health. Within this context, a bibliographic review of several studies on neuroarchitecture and aspects of ergonomics in the higher education process was performed and how this can influence learning.

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INTRODUCTION

Idealizing and designing spaces that welcome the most varied needs of the various users is one of the great challenges of architects. To obtain a satisfactory result, it is necessary to promote the combination of some factors, such as creativity and functionality. Currently an area of knowledge has been developing and impacting the ways of thinking and solving the environments, Neuroarchitecture, which is configured as an interdisciplinary area that connects biology to architecture, seeking to expand knowledge about the relationship between the environment and its users, showing the physical space as an influencer of the brain and behavior. The technique aims to work on this relationship, that is, it tries to unite neuroscience and architecture in order to design environments that stimulate not only productivity, but promote physical and mental well-being.

The aim of the research is to evidence the performance and use of neuroarchitecture studies in the school environment, both face-to-face and virtual, considering the needs of individuals, functionality, safety, comfort and teaching health, focusing on the analysis of the relationship between space, mind and behavioral performance.

In this sense, it is justified to present this method of architectural projection as a mediator between the solutions pertinent to the theme worked within this type of project and the visible and essential needs to users of these spaces. Therefore, this research becomes plausible because it seeks to study the importance of the use of elements related to

neuroarchitecture and ergonomics appropriate to the school environment, contributing accurately and practice in the teaching and learning process in general, seeking to use specific solutions within a design format that interferes with the intentions of seeking environmental uses and conformations before even defining them within the constructed spaces.

For this purpose, a bibliographic study of the most appropriate theoretical approaches on the subject was carried out and focused on the influences on teaching and learning processes within the school environment, theorizing on the themes neuroarchitecture and ergonomics in order to demonstrate how these aspects can be perceived within the teaching profession and the health process of these figures related to the act of teaching and learning.

Based on this understanding, the research presents theories and teaching practices and its relationship with the constructed environment, which has the ability to influence the mental and physical health aspects of teachers according to the way it is thought, planned and conceived in its project process, thus making the environment an important part within the general context of this area of activity, since it is part of the comfort and quality of life of professionals to connect in a healthy and efficient way with the students involved. In this sense, neuroarchitecture contributes not only to an understanding of the human being, but also to a greater knowledge of the various groups of users of the environments that are created.

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Objectives

General Objective

The present work aims to identify and analyze the ways of designing environments focused on neuroarchitecture that brings appropriate aspects to the school environment, since it seeks to understand the conatural patterns of brain functioning and how physical space can influence its performance. For this, it seeks to use the study of the term ergonomics as one of the pillars in the elaboration of appropriate locations the needs of users, as well as the specification of materials, color sensations, lighting, acoustics that are examples of innate reactions of the brain in response to certain stimuli of the environment and contribute to influence behaviors and consequently, can affect and interfere in the health of teachers, in order to understand the importance of evaluating all these factors of the work environment of the education professional and their influence on their attitudes in the classroom.

Specific Objectives

- Analyze school work environments and their projective particularities
- Observe the behavior of the education profession within the school environment
- Investigate the concept of neuroarchitecture and ergonomics
- Understanding the importance of neuroarchitecture in teaching health

Theoretical Foundation

Teaching

The exercise of teaching, as a transformative act that is reconstructed both in theory and in practice, fundamentally requires the development of a critical consciousness. And in this sense it is possible to say that this teaching action requires organization. According to Freire (1997), "Knowing that teaching is not transferring knowledge, but creating the possibilities for its production or construction."

Educating, according to Freire's thoughts (1979), should complete thoughts, because man is an incomplete being, who is fully aware of it and exactly why he seeks knowledge and educates himself. Knowledge is realized through constant overcoming, because of this the teacher should not put himself in the position of the higher being who teaches a group of ignorant, but rather in the humble position of the one who communicates a relative knowledge, that is, it is necessary to know when the students know more and make them also know with humility.

When analyzing the situation of teaching, it still seems to predominate, in this field, the belief that "to be a good teacher, it is enough to master the area of specific knowledge that will be taught", which is one of the misconceptions of the model of technical rationality, according to Pereira (1999, p.112).

This finding is also presented in other studies, (...) there is a tradition in the area in the sense of considering that, to be a teacher, the most important thing is to be a professional in the area related to the subjects that you will teach or teach. The teacher of technical education is not conceived as an education professional, but a professional from another area and who also teaches in it (OLIVEIRA, 2006, p.5).

To understand and relate teaching practice and architecture, it is necessary to understand this area of activity as a work established by human interactions, in which the worker relates to his work object in a personal and physical way, thus overcoming the normative perception of the craft, focusing the analysis of teaching in the organization and work process of teachers as mediators, analyzing the need to adapt the spaces to their functions within the school environment.

Within the school environment, those involved, students and teachers, act, usually with feelings, particular problems, diverse experiences and cultures, diverse moments of life, social classes, and various experiences that are unique and individual, this interferes in the work environment so with the environment can interfere in these behaviors, postures and interpersonal relationships, "[...] cyclically, that is, man modifies the environment, this modifies man and man changes it again" (MILANEZE, 2013 p. 59).

Neuroarchitecture and Ergonomics

Architecture includes concepts as vast as complex, reflecting the dichotomy between full spaces and empty spaces. Through a project based on the principles of good architecture or good quality architecture, the built environment brings with it an intrinsic objectivity capable of opening its own possibilities for its use, awakening the human senses and assisting its users in the process of understanding and appropriation of space (HOLANDA, 2015).

With neuroscience related and allied to architecture, it is acceptable to think of a new way of living within the built environments, so it is necessary to consider the basic priorities of users to emphasize their personal satisfaction, productivity and healthiness. Therefore, it is possible to think about rest, the conception of thoughts and ideas, comfort, behaviors, in short, each space designed seeking to use premises related to this architectural technique will be appropriate for the project to awaken, in some way, intellectual triggers in the individuals involved.

Neuroarchitecture is recognized as the study and strategic use of the impact of the environment on people's behavior. The architecture studied under analysis of the influence of the environment on the mental health of patients reveals that the physical space directly affects the behavior of users, analyzing their well-being. This research is also known as environmental psychology, where man not only acts as a passive user of the environment, but as someone who acts directly in the environment. (ESPINDULA, L.; GOULART, L.; PAPA, M.p.3).

The various properties of each environment, such as lighting, *layout and organization*, colors, textures, aromas, sounds and opportunities and impressions that it can offer can affect the physiology of the body and brain. These characteristics of spaces result in changes in emotion levels, decision-making, behavior and even health and well-being of users. That is, some spaces can stimulate mental states of maximum creativity or self-criticism, act in concentration or dispersion, include collaboration or competition, facilitate or impair learning and memorization, or even contribute to health recovery and reduction of pain perception.

Thinking of architecture as an integral part of the daily life of human beings, a stimulus related to the fact that it is always

present in a constructed space, whether to reside, work or study, it is notorious the direct link with neuroscience, which helps to understand human performance according to their experiences and experiences within the places, neuroarchitecture is directly linked to developing methods capable of interpreting the influence of built environments, and interventions that can affect the human organism, such as mood, disposition, movement, competence, interaction and motivation, in addition to seeking elements to meet the physical, psychological and emotional needs of individuals.

Most people spend their whole lives in constant contact with architecture. It gives us a place to live, work and have fun. With so many responsibilities for determining our experiences and with such a variety of uses, architecture has too many ways to be categorized accurately. (CHING, 2014, p. 9).

The concept of work space involves understanding the generalized relationship between individuals participating in the supply or demand of work, organizations, the ecological environment as the physical basis of work and its infrastructure (SANTOS, 2008). Also according to Santos, 2008, the study implies the understanding of the workspace as an inseparable, supportive and contradictory set of interactions between object systems and individual or collective action systems, which grant it the capacity for transformation.

Within neuroarchitecture one can mention a relevant sector that deals with aspects related to teaching health, ergonomics, which is a scientific discipline related to the interaction of the human being and artifacts from the perspective of science (KARWOSKY, 2005). Ergonomics acts in the formation of the environment adapting them to the conditions of users, with the objective of contributing to the comfort felt within the built spaces, improving the quality of life and performance in the most varied functions.

Ergonomics is the study of the relationship between man and his work, equipment and environment, and individually the good use of knowledge of anatomy, physiology and psychology in solving the problems arising from this relationship (IDA, 2005). The objectives of ergonomics are safety, satisfaction and well-being. Ergonomics focuses on man, besides the machine, the environment, information, organization and the consequences of work. The conditions of insecurity, unhealthiness, discomfort and inefficiency are eliminated when appropriate to the physical and psychological capacities and limitations of man (DUL; WEERDMEESTER, 1995).

It is important to emphasize that man is a holistic being and directly connected with the environment in which he lives, constantly interacting with him in the search to progress in various senses, habits and attitudes, both personal, social or work. Thus, the improvement of working conditions and the search for production optimization, simultaneously with the comfort of the worker, are a constant investigation of man. In this sense, the area of education, that is, teachers, run the risk of enduring physical and mental exhaustion, taking into account the material and psychological difficulties associated with the exercise of teaching.

MATERIALS AND METHODS

The methodology adopted for this research was thought in an exploratory nature and formulated through research and

bibliographic data made in consultation with books, articles published in journals and scientific events related to the theme. This is a descriptive research on the theme that addresses concepts and explores definitions pertinent to the use of architectural techniques within the premises of neuroarchitecture appropriate to well-being, comfort and teaching health in school environments. Therefore, it was necessary to use a methodology in order to demonstrate the relationship between the theoretical texts studied, documents analyzed and the situation present in some recurrent circumstances in study environments, analyzing how behaviors are directly affected by the solutions adopted in the most diverse conditions of occupation in school environments.

RESULTS AND DISCUSSION

As a result of this research, the influence of projective solutions within the spaces constructed in the educational question is notorious, since both students and teachers need minimal health within the study and work environments in order to obtain comfort and quality in the learning processes to ensure a good perception of content and sensations that are fundamental for the physical and mental growth of students in general.

In school environments it is necessary to be careful with all the details that involve dimensions of spaces, finishes, suitable materials, aiming at visual, acoustic and thermal comfort, as well as furniture in accordance with all the needs of users and mainly obeying the standards established by the standards of ergonomics, since it is fundamental the concern with universal accessibility in order to meet all people, especially those with special needs.

All these issues have a direct relationship with the health of users, whether they are students, teachers and other professionals who are within the process of educating. Therefore, thinking about healthy environments in all aspects becomes a satisfactory result in a possible problem that the architecture of space can bring, create healthy spaces, with pertinent concerns can favor the greater interaction of those involved.

Final Considerations

According to this research, it is noted that the posture and conditions of the work environment influence the teaching profession, making it possible for it to be present among the most stressful functions nowadays, in this sense an architectural project making use of the techniques pertinent to neuroarchitecture contribute to a satisfactory result in the objectives that are necessary to the duties of teaching.

In view of the objective of this work of addressing the theme of neuroarchitecture and its influences within the teaching work, it was verified how this influence happens and is noticeable when it comes to actions and feelings of users. It is possible to conclude that, according to the projective solutions adopted in school environments, the behavioral conditions of teachers and students can be altered and affect comfort, quality of life and mental and physical health.

The humanization of the constructed spaces is fundamental to ensure the feeling of territoriality, of belonging to the place, when the brain feels at home, diseases are mitigated, vision and concentration become more efficient, demonstrating the need of the human being to feel good, in his refuge where he

identifies and remains at will both physically and psychologically.

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How to cite this article:

Maria Cláudia Lima da Cruz (2022) 'The Influence of Neuroarchitecture In The Relationship of Spaces With The Health of Teachers', *International Journal of Current Advanced Research*, 11(04), pp. 616-619.
DOI: <http://dx.doi.org/10.24327/ijcar.2022.619.0137>
