



## Ergo-Environmental Variables That Affect the Job Satisfaction of the Staff of Two Institutions of Higher Education

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### ABSTRACT

A research on ergonomics related to ergo-environmental factors and its impact on job satisfaction of academic staff of two Mexican universities is presented. A validated questionnaire with .94 reliability is applied in the Crombach Alpha. It is obtained that the ergo-environmental factor that more impacts is the illumination and the temperature like the one that less. The conclusions and recommendations are described.

**KEYWORDS:** Environmental factors, Labor Satisfaction, Institutions of higher education.

### 1. Introduction

In Mexico there are two types of Universities in terms of economic aspects. The first, those in which the Federal, State and Municipal governments provide resources for its operation, and the second, those that charge monthly fees to students for their exercise (Mateos et al., 2016). In this research we worked with the second type of higher education institutions, exposing their differences and similarities between them, analyzing the impact of Ergo-Environmental Factors (FEA) on the Job Satisfaction (SL) of teaching staff.

The private universities that are included in this research have different philosophies and inspirations so it is found that the mission and vision of each one of them is particular and unique due to its "Visualization Process" in which particular values are included.

The University of Secular Inspiration is one that does not profess any religion but respect the preferences of its members, only yield to the state and federal government (Velázquez et al., 2016). Its objective is to respect the democratic principles of coexistence and fundamental rights and freedoms, through an integral human formation (Contreras and Solórzano, 2017). It promotes education from childhood to adolescence, as well as the acquisition of intellectual and work habits, and finally, training for the exercise of professional activities.

The Catholic-inspired University aims to develop plans and actions together. They have a compromise between the authority of the same and the clergy, as well as with society (Dietz, 2014). The creation of these must have the approval of

the local diocese, reporting both the academic status and their pastoral activities and Catholic identity.

The importance of evaluating job satisfaction is given by the need for HEIs to know the situation of their employees, the lack of staff training is observed (Moreno, 2004), which causes delays, lack of motivation and absenteeism (Catalán and González, 2009). The instruments of measurement of this construct that are found in the literature of the field, are given in an ineffective way because they do not evaluate the variables of interest. The foregoing induces the present investigation.

The resulting model was analyzed with the statistical package LISREL (Linear Structural Relations) created by Jöreskog and Sörbom (1986), which offers a greater variety of estimation methods and has a graphical interface that allows creating the model (path diagram) automatically, once the statistical analysis of the data is "run".

#### 1.1 Labor Satisfaction

Sánchez (2008), comments that the SL is "The feeling of well-being derived from the fulfillment of some expectations or of some needs" (p.9), exposing the clear difference between this concept and the motivation. While this implies energy and effort for what is derived from the attitude, the SL belongs to the emotional sphere (Pecino et al., 2015).

The SL is studied from a series of variables that are analyzed both together and separately. Those used in this research were taken by the references of other researchers who have worked with them in the educational field (Canton and Tellez, 2016), (Zurita et al., 2015), (Anaya and Lopez, 2015). For this study

15 variables are taken, among which are the relationship between the boss and the subordinate, company management, attention to the suggestions made by the worker, the schedule, stability in employment and those shown in next table.

**Table 1.** Variables studied in Job Satisfaction

Variable	Authors	Descriptions
Perception	Sánchez (2008), Merino et al., (2008).	Economic income received by the worker in relation to his effort
Beneficuous	Sánchez (2008), Warr et al., (1979), Anaya y Suárez(2007), Merino et al., (2008).	Promotions of the employee as well as the schedule and training
Market Stall	Abrajan et al., (2009), Sánchez (2008), Anaya et al., (2005)	Development of activities of each worker as well as the design of the position in relation to the personality of the employee.
Recognition	Sánchez (2008); Tejero et al., (2009)	Economic incentives, social or cultural writings obtained by the worker as a reward for a determined effort.
Relationship with colleagues	Merino et al., (2008)	Cordial, friendly, communication and collaboration of the employee with co-workers.
Supervision of the boss	Merino et al., (2008), Benedito et al., (2008)	The worker's relationship with the immediate boss must be cordial and communication for the best development of the position.
Working conditions	Molina et al., (2009)	Analyze the degree to which the employee identifies and participates in their work
Leeway	Robbins (2009)	Measures the degree of freedom and independence that the employee has to develop their work

Source: Elaboration based on authors

### 1.1.1 Labor Satisfaction in the education sector

Some of the research carried out previously in the educational sector in which the variables observed in Table 1 are used, are like the one conducted by Barraza and Ortega (2009) in which the degree of SL is identified in the academics of educational institutions. With a bachelor's degree, which resulted in the same professors having a high level of SL regarding the factors of professional performance, not so with regard to organizational factors.

In 2008, González conducted a study in the universities of a province of Venezuela, obtaining as a result of his research that one third of his sample presents very low rates with respect to SL, caused by distress (bad stress). Frías (2006), concludes that Spanish university professors are far below the average compared to the SL, due to the number of universities that are opened each year. The foregoing affects the proper functioning of the institution and the creation and improvement of policies.

A study made to teachers of Catholic institutions in Madrid is the one presented by De Frutos et al. (2007), in which they concluded that SL is moderately satisfactory and shows no signs of depression but anxiety. Anaya and Suárez (2007), carried out an investigation in which the academic staff was found in medium-high levels in SL regarding the design of the work, however in regard to promotion, superiors and salary, these are found in the level medium.

### 1.2 Ergo-environmental factors

The specific objective of ergonomics refers to the consideration of human beings in the design of objects, the means of work and the environments produced by the same man that are being used in different life activities, in order to increase functional efficiency (Kompier et al., 1995) so that people can use them and maintain or increase the desired values in the process (health, safety, satisfaction, quality of life).

Environmental ergonomics is the study of the environmental factors that constitute the environment of the man-machine system and the physical conditions that surround it and that influence its performance when performing various activities (Encarta, 2002), these conditions are:

- Sound environment
- Light environment
- Thermal environment
- Vibrations

The application of knowledge of environmental ergonomics helps the design and evaluation of posts and work stations, in order to increase the performance, safety and comfort of those who work in them (Fernández, 2001).

### 1.2.1 Environmental Ergonomics in the education sector

As it has been mentioned in previous paragraphs, environmental ergonomics is a fundamental part for the

welfare and integral health of individuals, regardless of the context in which they are located (Cedeño and Trujillo, 2014). For this it is considered important to mention some related research in and for the education sector. Such is the research carried out by Krüger et al., (2004), in which they present the results regarding the functioning of the classrooms of a higher education institution. In this, the vibration factor was excluded, given that the work developed by teachers is not significant.

Bidassie et al., (2010), analyzed the facilities of an institution of higher education observing the deficiencies that are had as far as the FEA is concerned. They determined that fixing them would have a very high cost and that the FEA should be taken into account from the architectural design of the property. They propose that in the construction of any institution and more education, the design should be carried out as a team with the experts in ergonomics.

Gálvez et al., (2005), related jobs and seniority with various pathologies, such as carpal tunnel syndrome, tendonitis, cervicalgia and low back pain. The workers suffering from disorders were given specialized treatment and the possibilities of a change of position or tasks were analyzed.

Taking into account the previous investigations, the results obtained from the evaluation of the FEA in the SL of the teachers of two IES Mexicans are exposed.

## 2. Methodology

### 2.1 Investigation Design

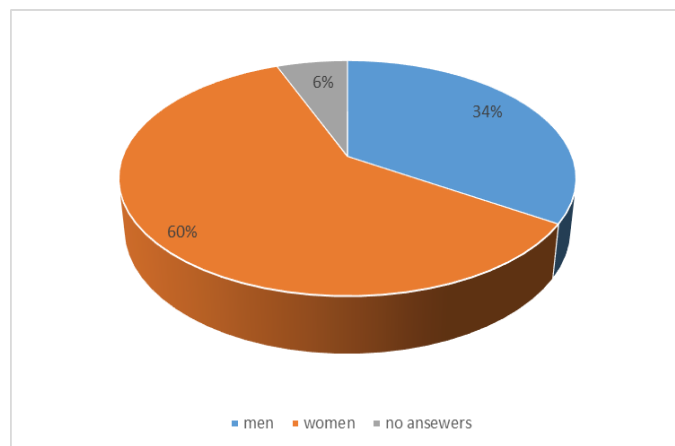
The research was carried out in two IES whose design is: experimental, quantitative, transversal, exploratory and descriptive. The measurement instrument is made up of 19 items, of which the first fifteen belong to Warr, Cook and Wall (1979), called "Overall Satisfaction Scale", and the last four correspond to FEA. The scale of measurement used is Likert, of seven levels ranging from "very dissatisfied" being the level one or lower to "very satisfied" corresponding to the highest level, and which has been used by Moreno et al., (2010 ) and Alonso (2006), among other researchers.

The population size of the universities under study is 883 full-time teachers, so it was determined to obtain a sample of 193 people with a confidence level of 95%.

## 3. Results

The results obtained from the survey applied to the total of the sample are presented, clarifying that there were participants who left answers without answering. With regard to age, it can be seen in the age range of the teachers is between 20 and more than 61 years being trained as shown in Table 2.

**Figure 1.** That 60% of the respondents were female, 34% were male and 6% did not answer.



**Figure 1.** Surveyed by gender

Source: Self made

**Table 2.** Age of respondents by ranges

Age ranges	Number of respondents
Between 20 and 30 years	72
Between 31 and 40 years	71
Between 41 and 50 years	38
Between 51 and 60 years	12
61 and more	0
without answer	0
<b>Total</b>	<b>193</b>

Source: Self made

To determine the ergo-environmental variables that have more or less impact on the SL, the statistical package Lisrel (Linear Structural Relations) created by Jöreskog and Sörbom (1986) was used, which offers a greater variety of estimation methods and has a graphic interface that allows you to create the model (path diagram) automatically.

We run the confirmatory factorial analysis obtaining that out of a total of 19 variables, 12 are eliminated by having loads <0.05 (Garson, 2012), these being: Relationship with colleagues, recognition, responsibility, capacity, relationship of the address with the employee, promotions, company management, suggestions, variety of tasks to perform, stability in employment, natural lighting and temperature, for not having significance.

**Table 3.** Values of significant variables

Variable	Value of the charges
1 Physical characteristics of the work	.801
2 Freedom of action	.873
5 Relationship with the immediate superior	.652
7 Perception	.638
13 Schedule	.942
17 Artificial lighting	.739
19 Noise	.792

Source: Self made

The resulting model is shown in Figure 2, leaving the value of the charges as shown in Table 3.

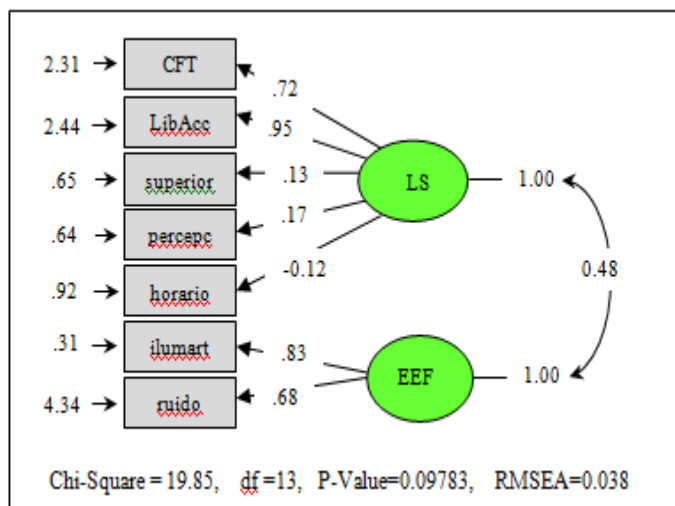


Figure 2. Resulting model

Source: Self made

As shown in Figure 2, the most significant resulting variables are five of SL and two of FEA. Of the above it is said that both the physical working conditions (CFT), which are related to the artificial lighting variables (ilumart) and noise have a significant result, as well as the variable LibAcc (Freedom of action).

Given that the Mean Quadratic Approximation Error (RMSEA), represents the advance adjustment with the total value of the population (Lévy, 2003), being 0.038, and because it is less than or equal to 0.05 indicates an approximation error of the model with reality (Kline, 2005). In the case of P-Value = 0.09783, this must be  $\geq 0.05$ , so the model is accepted.

#### 4. Conclusions and Recommendations

It is observed that the highest percentage of response is given by the female sex with 60%. The age range begins in 20 years, not finding professors over 60 years. Even so, the population under study is mostly young since they are between 20 and 30 years of age.

In the present study there are seven significant variables of 19 total, being these: The physical conditions of work, the freedom of action of the teacher, the relationship with the immediate superior, the salary and the schedule, which belong to the SL construct. Within the FEA it is observed that both artificial lighting and noise impact on the SL of the teachers of these HEIs in Mexico.

The fact that the academics work in secular IES or with some tendency or religious inspiration, the significance is irrelevant since the variable pertaining to this item was eliminated from the first moment, when the Exploratory Factor Analysis (AFE) was run.

It is recommended that HEIs in evaluation take into account the results to act in favor and benefit of employees, mainly in

the case of artificial lighting and noise. In the first, it is necessary to increase the number of luminaries both in the offices and in the classrooms since they are insufficient. Regarding the second, it is necessary to put signs of silence and indicate to the students that when they leave school they do so calmly and without shouting, since the cubicles and offices of the teachers are located next to the classrooms. It is also necessary to develop and apply programs that include personal relationships, this would help improve the relationship between peers and the immediate boss. As far as perception is concerned, HEIs need to evaluate and in due course redesign the salary and salary table since it is a very important factor within the SL. Given the resulting value of this variable in the final model, most employees are very dissatisfied with their income.

To conclude, the application of this type of studies is already encouraged. In short, the results can help improve and increase the SL of teaching staff of HEIs, in any state of Mexico.

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