

Expert evaluation of ergonomics and cultural influence on employees' choice of work

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Abstract

Human-Computer Interaction (HCI) has long been in a relationship with ergonomics, as a user is expected to have a suitable environment to display a good user experience. This study aimed to identify how organizational or employers' ergonomic values and culture influence employees' choice of organization to work for. A survey questionnaire, containing 30 items with a Likert Scale (Strongly disagree -1 and 5 for strongly agree) was adopted. A total of 300 questionnaires were distributed and a sample of 250 full-time employees from various companies was used. The collected data was analyzed using descriptive means and correlation via SPSS.21. Results show that a significant dependent relationship exists between employee values and the organization's ergonomic values ($r=0.947$; $p<0.01$), and between employee's values and mean congruence between values ($r=0.829$; $p<0.01$). No significant relationship was found between organizational values and mean congruence between values ($r=0.096$; $p>0.05$). The findings in this study may provide direction on how organizations should adopt a better ergonomic design approach for mutual benefits with present and prospective employees.

Keywords: Employers' values; Culture influence; Employees' value; Choice of organization; Ergonomic matter

1. Introduction

According to [75], there is productivity when ergonomics is properly put into consideration in the workplace. Ergonomic value is said to be in place when an organization makes the workplace comfortable for the employees to use all computerized and non-computerized equipment to maximize productivity with less or no fatigue. Values and culture are fundamental and enduring aspects of both employee and employer organizations [30]. Studies have shown that an organization's values and culture help employees understand what the organization stands for, make the right decisions that help them achieve the organization's vision and goals [67] and [70], and guidance for their work, and a sense of security, including Bring Your Own Device (BYOD) security system implementations and employees use of their mobile devices anywhere to access privileged organization data and information [5], and what they look for in a job. Organizational culture such as flexible working hours, strong team dynamics, and clear goals to work towards, determine even the choice of organization the employees would want to work in [44], [47], [66], and [68]. Organizational behavior, values, and culture can affect the way people make decisions for or against the organization [21] and [41]. Businesses that are able to encourage risks in decision-making within the organization's culture can enhance innovation and creativity. Values are common to both organizational culture and employee personality because they serve as a link between employees and their organization. Organizations do not possess values and cultures apart from those of their employees. Organizational values and employee values are much the same in the fact that they both constitute the identity of the organization, and serve as the guiding principles for what is said and done [43] and [57], the various types of organizational rewards (extrinsic, intrinsic, and social) and employee retention [9]. However, while employee values are for them to uncover, organization values and culture are consciously chosen, guided, and pre-set [77]. Employee engagement is related to the leadership system perceived in direct values, culture, and supervision [81].

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Hence if organizations do not guide their norms, values, ethics, and culture, the employees' background culture will guide them [7] and [35].

When employees refuse to adhere to the rules and regulations of an organization or refuse to be guided by the organization's values and culture, their discretionary behavior (culture) now guides them. [6]. Values are motivating to employees to the extent that they reflect employees' well-being, normative, self-realization, and task-oriented values, within the organization's existing values and cultures [64] and [80]. An employee's motivation is embedded in his or her job comfort, values, and personality. The employee finds his or her job more meaningful and productive if his or her comfort, values, and personality are duly recognized by an organization [15] and [51]. Nevertheless, gaps exist between Employee's values and the organization's values and culture, which create inconsistency and confusion for employees [25]. The most successful companies identify these gaps and implement ergonomic strategies, systems, and processes that reduce them, taking actions that incrementally move the organization closer to its aspired culture for maximized productivity. According to [25], the values and culture of an organization are formidable drivers of performance which must coherently synchronize with employees' values and personalities to eliminate gaps between the two for better performance goals that meet employees' expectations and needs. Understanding an organization's values and culture is fundamental to understanding the meaning that employees will place on the job [60].

This study aimed to identify the strength of the relationship between organizational or employers' values and cultural influence on employees' choice of organization to work for. The general IT problem was the inconsistency, confusion, and struggles among employees and organizations, possibly due to gaps between the employee's desired comfort and personalities, and the organization's values and culture. The specific IT problem is that some organizations lack strategies, cultural practices, and value systems for achieving performance goals and meeting employee's ergonomic needs

1.1. Research Questions

Below are the research questions addressed in this study.

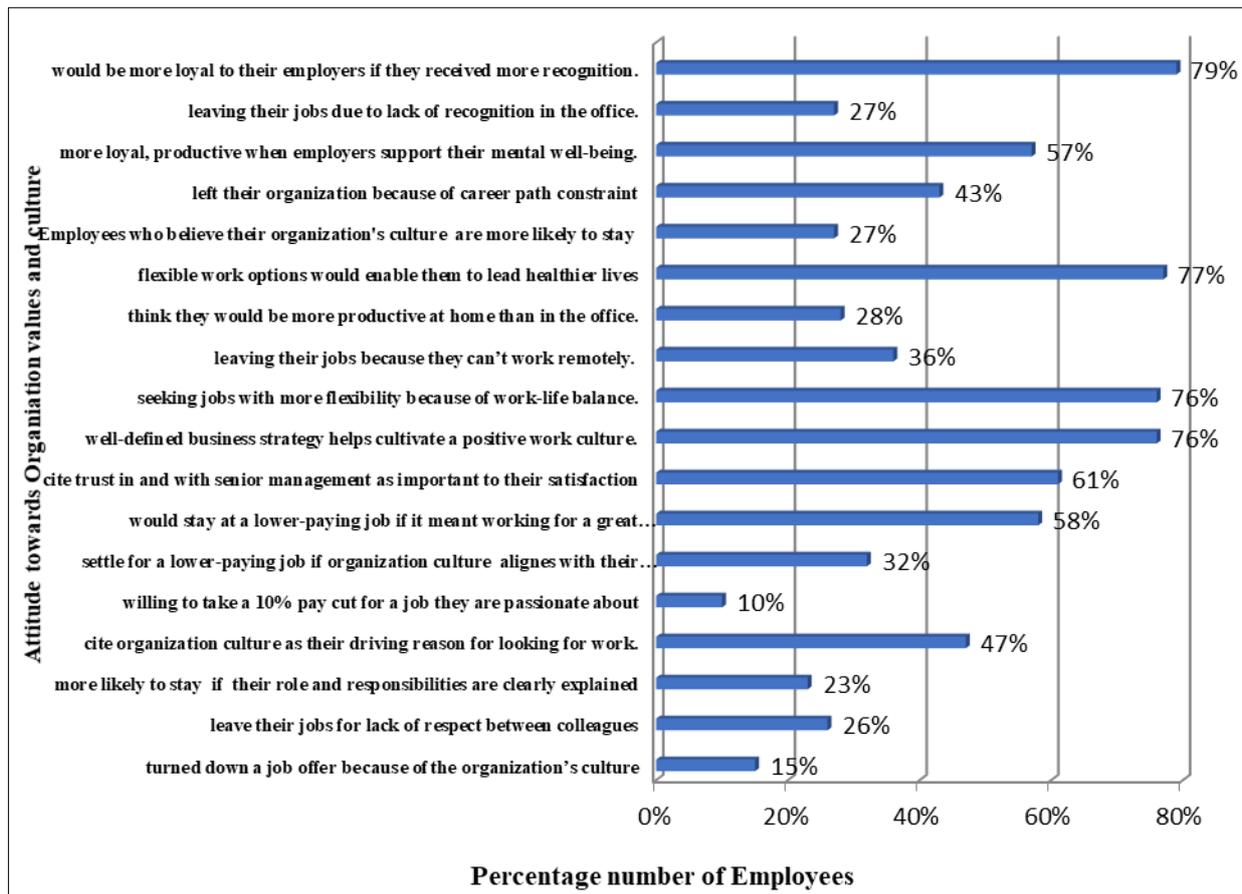
- Is there a significant relationship or association between Mean Employee Values and Mean Organizational ergonomic Values?
- Is there a significant relationship or association between Mean Employee Values and Mean Congruence between Values?
- Is there a significant relationship or association between Mean Organizational ergonomic Values and Mean Congruence between Values?

2. Literature Review

Organizational ergonomics and culture significantly influence employees' choice of organization to work in. Of course, if there is discomfort in the workplace, employees will definitely find their jobs uninteresting and may route to other organizations structured with ergonomics principles. Many HCI researchers have reported on systems with the comfort of workers in mind, to create working environments that would end musculoskeletal problems for employees [46]. Sensitive mats which brought comfort to workers have also been explored for a better employee experience [28]. Apart from physical environment comfortability, wrong systems can cause unwanted interactions when an employee is using such to work in an office. According to [32], pop-up windows can cause an employee to repeatedly make data entries, which will decrease his efficiency and productivity. Therefore, employers are supposed to take care of these ergonomic challenges to influence employees' productivity and satisfaction.

Apart from ergonomics values, diverse studies have claimed diverse relationships between employee values and organizational values and culture. Studies have shown that 46% of potential employees cite organizational values and culture as important when choosing the organization to work in, while 88% of potential employees cite organizational values and culture as of relative importance during job seeking as key to business success [39]. Employees who don't like their organization's culture and values are 24% more likely to quit while 15% of job seekers instantly turned down a job offer because of the organization's values, ethics, and culture [21]. 43% of workers say they left their organization because of career path constraints, while 63% of employees say they would not consider a job if the organization offered fewer than 15 days of pay time off each year, while 57% of workers are more loyal, productive and take less time off when employers support their mental well-being. 27% of employees report leaving their jobs due to a lack of recognition in the office. Recognizing top performers creates a palpable change within the organization's culture. 79% of employees say they would be more loyal to their employers if they received more recognition, while 65% of

employees think they would be more productive at home than in the office. Table 1 below shows some employee attitudes toward the organization's values and culture.



Sources: (de Campos & Rueda, 2017; Dvorak & Nelso, 2016; Kate, 2019; Naibaho, 2013; Paarlberg & Perry, 2007).

Figure 1 Employees's attitude towards organization values and culture

This study attempts to measure the strength of the relationship between organizational or employers' values and cultural and employees' values, and possibly how much of the influence or variation of organizational values on employee values can be explained, where significant relationships exist.

2.1. Contrasting Views on Likert Scale Data Analysis

The Likert scale is one of the most widely adopted psychometric tools in social and applied sciences with some peculiar susceptibility to a medley of undeniable misconceptions [8] and [24]. The adequacy of treating Likert Scale ordinal data as interval data has continued to be controversial in survey analyses. In applied statistical fields, there has been a long-standing controversy regarding whether ordinal data, converted to numbers, can be treated as interval data [65]. The long-time debate resulted from the fact that means, standard deviations, and parametric statistics, which depend upon data that are normally distributed, may not be the best average estimate or measure of the central tendency, to analyze ordinal data. Means and standard deviations computed from nominal data do not portray clear meanings in descriptive statistics when applied to Likert scale responses [65]. Researchers have argued that since Likert data are of an ordinal or rank-order nature, the median and mode are more appropriate measures of central tendency; hence, only non-parametric tests may yield valid results [27] and [36]. Researchers with contrasting views claimed that the lack of understanding of the difference between Likert scales and Likert response formats is the root of the confusion which resulted from the practice by researchers who analyze the responses to Likert scale questions item by the item rather than a collection of items measuring a particular attribute [31] and [53].

There are empirical researches that have supported the interval view, and parametric statistics as perfectly all right when summed scores of Likert scale data are used to conduct parametric tests, such as Pearson correlation and regression analysis can be used with Likert data [36], [53], and [71], provided that the assumptions are clearly stated and the data is of the appropriate size and shape. Likert scale data has been used in unfolding models to fit empirical

data, and statistical modeling strategies, either in a parametric approach or in a nonparametric approach [38] and [42]. [19] suggest that for Likert data to be treated as interval data there is a need to develop multiple categories within the scale and establish equality of variance and normality of data distribution between each value on the scale. Clearly, If the sample size is large, ($n \geq 30$ observations per group) and normally distributed (or nearly normal), parametric tests can be used with Likert scale ordinal data [36]. According to [18], frequency tabulations, means, standard deviations, t-tests, chi-square tests, correlation coefficients, multivariate techniques, etc. are available for Likert scale data analysis. [48] claimed that data from Likert scales could be reduced to the nominal level by combining all agree and disagree responses into two categories "Agree" and "Disagree". The chi-square, Cochran Q, Binomial test of proportion, or McNemar test are common statistical procedures used after this transformation [65]. Summarized Likert items using the mode (not mean); are probably the most suitable for easy interpretation and expressing variability in terms of the range or interquartile range, not the standard deviation [48] and [65]. Distributions of observations of Likert are usually presented with dot plots or bar charts. It can't be a histogram, because the data are not continuous. The binomial test of proportion is a non-parametric test statistic used to analyze questions involving qualitative binomial mutually exclusive categorical (e.g. YES/NO or Agree/Disagree) responses. Conducting parametric and non-parametric tests such as Pearson and Spearman's rho conducted on the Likert scale does not affect the conclusions drawn from the results [50].

In summary, data from a Likert scale survey is considered to be ordinal or arguably interval [18], [19], [45], [50], and [74]. Where Likert-type data are analyzed item by item or as a summed scale, the data are recognized as ordinal. In this case, the mean cannot be used as a measure of central tendency, while the most appropriate measure of central tendency, in this case, will be the mode, or the median, and the use of bar charts will be the best way display the distribution of responses, On the other hand, if a Likert scale is composed of a series of four or more Likert-type items that represent similar questions combined into a single composite score/variable/domain, the Likert scale data are recognized as interval and can be analyzed as interval data, with the mean representing the best measure of central tendency [71], [74], and [78]. The general consensus is that the use of parametric statistical tests to analyze Likert scale data are potentially appropriate taking into consideration the recommendations provided here.

2.2. Choice of Research Methodology

Research methodology has been classified as qualitative, quantitative, or involving both qualitative and quantitative methods, typically referred to as mixed methods [34] and [59]. Quantitative methodology is about measurements and the generalization of relationships among variables [33]. The quantitative method is suitable for data sets that are numerically measured and analyzed using mathematically or statistically based methods to explain data results or phenomena [79]. Quantitative studies generally involve sampling methods that randomly select large representative samples [1]. Random selection of samples is a major factor in a quantitative study [12], with the need for statistical modeling or any extreme severity of mathematization, which is remarkably evident in the quantitative method. Quantitative methods are usually adopted in a study where random sampling was applicable. Quantitative studies are confirmatory in nature, meaning that their primary aim is to measure variables and test hypotheses [17]. This study has research questions and is intended to test hypotheses.

The qualitative method, on the other hand, is intended to gain subjective in-depth knowledge from respondents. Subjective in-depth gathering of knowledge to explore and discover meaning is often associated with data generally gathered in words, texts, and images including non-verbal cues, to explore phenomena but not to explain phenomena [49] and [54]. A qualitative approach will be suitable where interview questions involve the gathering of data that are subjective in nature and are generally gathered in words, texts, and images, including non-verbal cues, to explore the in-depth thoughts of participants [54]. In a qualitative study, analysis is done through the identification of themes and subthemes with no need for any statistical modeling, statistical probability significance tests, or any extreme severity of mathematization, as is remarkably evident in the quantitative method. The sampling method engaged in this study was probability or random sampling, contrary to non-random (non-probability), purposive census sampling as required in a qualitative study [14]. [58] defined purposeful sampling as a distinctively engaged and precise qualitative approach to case selection. Sampling is central to the practice of most research because high-quality results are dependent on effective and efficient data collection, which in turn, are dependent on good sampling practices [22].

The use of the probability sampling technique (random sampling) in this study is contrary to the qualitative study principle of reflectiveness of intended participants, and those willing to share with the researcher. The qualitative study research method was not deemed suitable when the proposed study was intended to generalize the results from data [23]. The main feature that describes this study was not met in qualitative non-random sampling, hence the author considered the adoption of a quantitative research method for this study. Mixed methods combine the application of both qualitative and quantitative approaches [20], [26], and [34]. Using mixed methods will require a working professional knowledge of both quantitative and qualitative methods [59]. Also, the mixed method approach requests

the inclusion of the qualitative method in the basic definition of the mixed method approach [63] and [69]. The fact that this study has no need for qualitative, precludes the applicability of mixed methods that combines both quantitative and qualitative methods. The mixed method is often embedded with the challenge of integrating quantitative and qualitative data during the analysis, interpretation, and presentation of results [73]. Moreover, mixed-method processes are likely to demand tangibly more time and resources than may be allocated to plan and implement this study. The mixed method approach is therefore inappropriate for this study which is handled by one researcher. For these reasons, the researcher deemed it inappropriate to choose the mixed method for this study.

2.3. Choice of Research Design and Ethical Issues

Quantitative Design Methodology generally involves random sampling designs that randomly select large representative samples required to generalize findings by applying probability sampling theory [72]. Sampling theory provides the basis for the generalization of relationships among variables and decision-making in the face of uncertainty [11] and [79]. A robust and efficient sampling technique is one that adopts strategies that are coherent, achievable, appropriate, and can explicitly and systematically address greater validity and stronger quality of the study [3], [52], and [62]. According to [12], the random selection of samples is a major factor in a quantitative study. Based on my population of the study, multi-stage sampling techniques were adopted by simple random sampling selected within the strata. to select eligible participants from the study population because this method is coherent or appropriate for a quantitative study. Purposeful sampling was not adopted because purposive or non-probability sampling is distinctively engaged as a precise qualitative approach to case selection [58]. Moreover, purposeful sampling was used mostly by qualitative case study researchers [29] and [76], especially where it is quite difficult to select random samples to represent the measuring tools [56], and where the intent is to sample information-rich or in-depth cases [14].

Appropriate probability sampling design method that selects samples designed to be perfectly representative of the target population is ideal because these sample results will be used to make inferences, or generalizations, about a larger population [40]. In making the choice of probability sampling therefore three probability sampling techniques were considered namely: Simple random sampling design, Stratified sampling design, and Cluster sampling design. The choice of simple random sampling, where each of the samples selected must have an equal probability of inclusion suggests that the target population size of the sampling frame must be known. The sampling frame is not known, therefore simple random sampling was not applicable. With a stratified sampling design, the target population is divided into strata (groups) before; randomly selected samples are taken from within each stratum. The stratified sampling method provides more control over representativeness and allows for intentional oversampling which permits greater statistical precision (i.e., decreases standard errors) [40]. Cluster sampling though similar to stratified sampling contains naturally occurring groups (e.g., peculiar locality) with randomly selected samples. This was not adopted because individual samples within groups tend to be more similar so we have less unique information, thereby decreasing statistical precision [40]. A stratified sampling design, in particular, multi-stage, was therefore adopted.

Data collection is frequently considered an intrusion into actors' sequestration with regard to the position of perceptivity of questions asked, and respondents' time taken [10]. Thus, maintaining a high standard of ethical considerations throughout the stages of the data collection process is needed. Three major ethical considerations of high norms are needed and should be completely espoused, as linked in The Belmont Report (1979), which included ethical principles of respect, beneficence, and justice to respondents. The Belmont Report was considered the introductory ethical principle for the protection of subjects in this exploration [13]. Belmont Report on ethical principles of respect for persons depended on two distinct principles.

- Respondents should be treated as independent agents in a manner that accord them respect, and the right to hold views, make choices, and opinions with respect to their particular values and beliefs. [2] and [16].
- Respondents with lowered autonomy should be entitled to fresh protections [37].

3. Data Collection

A survey questionnaire, containing 54 items with a Likert Scale (Strongly disagree -1 and 5 for strongly agree) was adopted, comprising three groups: Congruence between Values (7 items), Employee Values (25 items), and Organization Values and Culture (22 items). A pilot test was conducted with a sample of 50 employees to check the questionnaire/Likert scale reliability and data normality. Based on the findings of the pilot test, the questionnaire format was revised and the sample size was narrowed down to full-time employees to encourage mature and realistic feedback. The probability sampling technique was adopted as much as possible. A total of 300 questionnaires were distributed and a sample of 250 full-time employees from tertiary institutions, State and Federal civil servants, and other parastatal companies were used. Data were collected by simple random sampling within the strata selected using

multi-stage sampling techniques. A good sampling technique is one that deploys strategies that are coherent, achievable, appropriate, and can explicitly and systematically address greater validity and stronger quality of the study [4], [61], and [62]. The confidentiality of all respondents was duly maintained.

4. Data Analysis

A survey questionnaire, containing 54 items with a Likert Scale (Strongly disagree -1 and 5 for strongly agree) was adopted, comprising three groups: Congruence Between Values (7 items), Employees Values (25 items), and Organization Values and Culture (22 items). Fifty employees, randomly selected, were for a pilot test to check data normality and Likert Scale questionnaire reliability. Based on the findings of the pilot test, the questionnaire format was revised and the sample size was narrowed down to full-time employees to encourage mature and realistic feedback. The probability sampling technique was adopted as much as possible. A total of 300 questionnaires were distributed and a sample of 250 full-time employees from tertiary institutions, State and Federal civil servants, and other parastatal companies were used. Data were collected by simple random sampling within the strata selected using multi-stage sampling techniques. A good sampling technique is one that deploys strategies that are coherent, achievable, appropriate, and can explicitly and systematically address greater validity and stronger quality of the study [4], [61], and [62]. Analysis of data was facilitated by the use of Statistical Package for Social Sciences (SPSS) (version 21). SPSS was adopted for its benefit of enhancing credibility building by making the research processes more transparent and replicable. The Likert scale was composed into a series of three groups: Congruence Between Values (7 items), Employee Values (25 items), and Organization Values and Culture (22 items), which represent similar questions combined into a single composite score/variable/domain, are recognized as intervals and can be analyzed as interval data, with the mean representing the best measure of central tendency [18], [19], [48], and [53]. Therefore, the collected data was analyzed using descriptive means and spearman's correlation coefficient.

4.1. Research Question 2.1

Is there a significant relationship or association between Mean Employee Values and Mean Organization Values?

Table 1 Spearman's Correlation measurement of the strength of the relationship or association between Mean Employee Values and Mean Organization Values

Spearman's rho Correlations			
		Mean Organization Values	Decision
Mean Employee Values	Correlation Coefficient	0.947**	
	Sig. (2-tailed)	0.000	r=0.947; p<0.01
	N	250	Test is Highly Significant

** Correlation is significant at the 0.01 level (2-tailed)

Table 1 shows the Correlation Coefficient of the relationship between the Mean Employee Values and Mean Organization Values. The test is highly significant ($r=0.947$; $p<0.01$). There exists enough evidence to conclude that there is a significant relationship between employees' values and Organization's values. There are about 90% (r^2 %) of the total variation in Mean Employee Values can be explained by the linear relationship with Mean Organization Values. The other 10% of the total variation in Mean Employee Values remains unexplained.

4.2. Research Question 2.2

Table 2 Spearman's Correlation measurement of the strength of the relationship or association between Mean Employee Values and Mean Congruence between Values

Spearman's rho Correlations			
		Mean Congruence Between Values	Decision
Mean Employee Values	Correlation Coefficient	0.829**	
	Sig. (2-tailed)	0.000	r=0.829; p<0.01
	N	250	Test is Highly Significant

** Correlation is significant at the 0.01 level (2-tailed)

Is there a significant relationship or association between Mean Employee Values and Mean Congruence between Values?

Table 2 shows the Correlation Coefficient of the relationship between the Mean Employee Values and the Mean Congruence Between Values. The test is highly significant ($r=0.829$; $p<0.01$), and shows that there is a significant relationship between employee values and Mean Congruence Between Values, with about 69% (r^2 %) of the total variation in Mean Employee Values explained by the linear relationship with Mean Congruence Between Values. The other 31% of the total variation in Mean Employee Values remains unexplained.

4.3. Research Question 2.3

Is there a significant relationship or association between Mean Organization Values and Mean Congruence between Values?

Table 3 Spearman's Correlation measurement of the strength of the relationship or association between Mean Organization Values and Mean Congruence between Values

Spearman's rho Correlations			
		Mean Congruence Between Values	Decision
Mean Organization Values	Correlation Coefficient	-0.096	
	Sig. (2-tailed)	0.129	$r = -0.096$; $p > 0.05$
	N	250	Test is NOT Significant

Table 3 shows the Correlation Coefficient of the relationship between the Mean Organization Values and the Mean Congruence Between Values. The test is not significant ($r=0.096$; $p>0.05$), and shows that there is no significant relationship between organizational values and Mean Congruence between Values.

5. Conclusion

The results obtained from this research attempted to establish the fact that there is a significant relationship between employees' values and Organization's ergonomic values. The findings show that organizational ergonomic values and culture directly influence employee values, attitudes, and choice of organization to work for. Results show that a significant relationship exists between employees' values and Organization's ergonomic values ($r=0.947$; $p<0.01$), with about 90% (r^2 %) of the variations in employees' values being influenced by variations in organizational ergonomic values and culture. The other 10% of the total variation in Employee Values remains unexplained. Findings also showed that a significant relationship exists between employees' values and Mean Congruence Between Values ($r=0.829$; $p<0.01$), with about 69% (r^2 %) of the total variation in Mean Employee Values explained by the linear relationship with Mean Congruence Between Values. 31% of the total variation in Mean Employee Values remains unexplained. There appear to be a silent or non-statistically significant influence of organizational ergonomic values and culture on Mean Congruence Between Values ($r=0.096$; $p>0.05$). The findings from this study may guide prospective employees toward aligning their internal affective, normative, and task-oriented values, within the organization's existing ergonomic values and cultures. This finding is consistent with the findings by [55]. On the other hand, findings may also encourage organizations to modify some of their ergonomic designs and culture to close some employee-organizational gaps for better performance goals that meet employees' expectations and needs. These findings are consistent with works by [25], and [51]. Findings may motivate employees to adopt good values and behavior that will contribute to sustainable development in an organization. If organization stakeholders in turn apply good ergonomic design to encourage reasonable feedback and employees' well-being, performance goals will, in turn, meet the organization's expectations.

Compliance with ethical standards

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Disclosure of conflict of interest

There are no conflicts of interest.

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