Educational Ergonomics and the Implementation of Instructional Curriculum in Nigerian Colleges of Education

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Abstract- ***Education is the bedrock of any society, especially in the globalized world where knowledge economy and learning has become the focus. Achieving an effective and unbiased curriculum implementation is not possible in any institution without a careful and conscious design of the learning environment. Ergonomics is the structural design of the environment or system to fit the achievement of workers and the organization. Ergonomic design of the educational workplace determines to a large extend, the implementation and achievement of the curriculum objective in such system. Therefore, educational ergonomics plays fundamental roles in accomplishing educational goals. Educational ergonomics is concerned with the structural design of the school environment to allow for effective and efficient cooperation and implementation of responsibilities in an institution. Therefore, this study was carried out to determine the impact of educational ergonomic in the implementation of instructional curriculum in Colleges of Education in South-South Nigeria. Descriptive survey was used with sample size of 200 respondents drawn for lecturers and students. A self-structured questionnaire was designed to elicit information from the respondents, while physical assessment and interview were conducted to support evidence of the questionnaire. The collected data will be analyzed using correlative statistical tools of mean scores and standard deviation, while ANOVA was use to correlate the regression analysis subject to Statistical Package for the Social Sciences (SPSS) version 26.0.The collected data will be analyzed using correlative statistical tools of mean scores and standard deviation, while ANOVA was use to correlate the regression analysis subject to Statistical Package for the Social Sciences (SPSS) version 26.0.The results of the study showed that there is moderate impact of educational ergonomics on instructional curriculum implementation in Colleges of Education in South-South, Nigeria. Thus, the study recommended are evaluation of the ergonomics of the colleges of education to adopt ergonomically best practices within global educational institutions.***

Indexed Terms- ***Education, Ergonomics, Implementation, Instructional, Curriculum***

I. INTRODUCTION

Education is the bedrock of any society, especially in the globalized world where knowledge economy and learning has become the focus.In this regards, globalization has made education more relevant and necessary to the citizenries. According to Uche and Okata (2015) in the wake of globalization every aspect of human life, i.e. science, technology, culture, economic, environment, social and politics etc, has undergone tremendous transformation. This is made possible by the changing focus in education. Uche and Okatafurther stressed that education and educational institutions are the vehicles that propel the rapidly changing world and its new ideas and demands, and therefore must constantly and continuously undergo changes and improvement both in its curriculum and learning environment.

Therefore, achieving an effective and unbiased curriculum implementation is not possible in any institution without a careful and conscious design of the learning environment. According to Evertson, Emmer and Worsham (2006) effective teaching and learning cannot take place in poorly managed classroom. The author stressed that arranging the physical setting for teaching is a logical starting point

for classroom management because it is a task that all teachers face before school begins. According to OECD (2009) relevant aspects of the school environment are the physical environment, the social system, relationships between principals, teachers and students, a sense of community, teacher and student morale, norms among peers, and safety. School climate is fundamental for the quality of schooling and instruction. Teaching and learning are made possible in a conducive learning atmosphere. Effective teaching and learning cannot take place in a disorganized environment, because it threatens people's sense of personal control which in turn depletes their ability to regulate themselves. Clarity and structure seem to help maintain students' attention and a positive disciplinary climate; conversely, a poor climate might restrict the use of effective teaching practices (OECD, 2009). . Thus, designing the school system to encourage instructional curriculum implementation is one way of achieving educational objectives, such as effective classroom management and learning positively. It is this environmental design of the school system that is termed ergonomics. Ergonomic design in all ramifications is a prerequisite to achieving institutional and organizational objectives.

Ergonomics is defined as the science of making jobs and environment fit the worker or their users (Uche and Okata, 2015). It can also be seen as the study of the interface between individuals' physiological environments (Noe, Hollenback, Gerhart, & Wright, 2004). Ergonomics is the structural design of the environment or system to fit the achievement of workers and the organization. Ergonomics is a science-based discipline that brings together knowledge from other subjects such as anatomy and physiology, psychology, engineering and statistics to ensure that designs complement the strengths and abilities of people and minimize the effects of their limitations (International Ergonomic Association, 2017). Rather than expecting people to adapt to a design that forces them to work in an uncomfortable, stressful or dangerous way, ergonomists and human factors specialists seek to understand how a product, workplace or system can be designed to suit the people who need to use it. The underlying proposition of ergonomics is that human performance can be measurably improved, and stress can be reduced by appropriate design and implementation of interactions among humans and other elements of a system. Ergonomics focuses on 'fit' between technological tools, the environment and the people who exist within the system. Therefore, it considers the users' capabilities and limitations in ensuring that tasks, equipment, information and the environment are suited to benefit the people that use them.

"Ergonomics is the scientific discipline concerned with the understanding of interactions among humans and other elements of a system, and the profession that applies theory, principles, data and methods to design in order to optimize human well-being and overall system performance'' (International Ergonomics Association, 2017). The Association stressed that, within the discipline of ergonomics there are domains of specialization, which is a system-oriented discipline that extend to all human activity. Nwankwo (2021) in buttressing the above position stated that the domains within the discipline of ergonomics are physical, cognitive and organizational ergonomics.

Ergonomic design of the educational workplace determines to a large extend, the implementation and achievement of the curriculum objective in such system. Therefore, educational ergonomics plays fundamental roles in accomplishing educational goals. Educational ergonomics is concerned with the structural design of the school environment to allow for effective and efficient cooperation and implementation of responsibilities in an institution. It encompasses physical, cognitive and organizational infrastructures that interact to deliver the objective of the system. Taking a look at the above scenario it is pertinent to state that, succeeding in instructional curriculum implementation in tertiary institutions is directly related to the depth of the educational ergonomics associated with such system.

Nevertheless, the case in most Nigerian institutions is not encouraging. Without prejudice, studies have shown that the infrastructural state of some Nigerian institutions are in bad state. According to Odejele inUche and Okata (2015) there is poor maintenance culture in Nigeria, hence facilities in most of the Universities located across Nigeria are not in good

and functional state. Also, Onyekwelu (2002) stated that the educational industry is one of the largest sub-sectors in Nigeria economy and Africa at large, at such governments cannot fold their arms and watch the existing structures in the educational system collapse.

- Educational Ergonomics and Implementation of Instructional Curriculum

Education, as has been widely accepted by nations all over the world is the bedrock of national development. The higher institutions are nations' manpower development storehouses where the dreams and aspirations of a nation like Nigeria can be translated into realistic goals. The objectives of education can only be achieved in a comfortable and safe teaching and learning environment. Teaching and learning environments in higher institutions must be designed in such a way that it matches the capabilities, limitations and the needs of the users (Uche and Okata, 2015). The author further asserted that when work environments are ergonomically designed in such a way that the safety and health of the employees or the users are put into consideration, then it will become user friendly and enhance efficiency of work and productivity. Quality of teaching and learning in an educational institution, in terms of conformance to standard and safety of purpose is a direct determinant of the quality of the products or graduates from such institutions. According to Ebong (2006), the standard of the environment in which teaching and learning take place helps to determine the progress or failure of the school endeavour.

Educational ergonomics deals with that field of human dynamics/ergonomic discipline that is concerned with the communication of educational performance and educational strategy. The foundation on which educational ergonomics is built is the students' performance to a substantial degree and it is context specific, that is it specialized in relation to specific plan factors and ergonomic interventions that is directed at design improvements that consequently can benefit education. Thus, educational ergonomic is focused on achieving the intention for which the system is designed for. The students been the fulcrum of learning institutions, implementing instructional curriculum underpins the purpose of the system.

- Physical Ergonomics and Implementation of Instructional Curriculum

According to Nwankwo (2021) physical ergonomics is basically the science of designing user friendly interaction with equipment and workplaces to fit the user. It is concerned with human anatomy, anthropometric, physiological and biometrical characteristics as they relate to physical activities. It involves the dimension of human body operation in consideration to muscular and limbs postures, which interconnects with the physical workplace conditions and arrangements to suit the requirement of the body and standard acceptable for work-rate and workload (Tiphanie, 2016). In other words, it relates with workplace designs. It involves the design of workstations, work practices and workflow to fit the employees' capabilities. It also involves a design that reduces risk factors that may contribute to common work-related injuries and illnesses, such as sprains, strain and cumulative trauma disorders (CTDs) (Occupational Safety and Health Academy (OSHA, 2017). According to De Looze and Koningsved (2016) physical ergonomics deals with the physical load on the human body when performing activities like work, sport, jobs at home or dealing with products.

Thus, pertinently relating it towards instructional curriculum implementation, the human body and its performance or posture determines to a large extent the achievement of curriculum objectives. The authors asserted further that the human body at work is (external) exposed to a work situation (work demands, working environment) and working methods (the work activities to be performed). Therefore, this brings us to the importance of environmental designs in instructional arrangement. The structure of buildings, the position of offices and classrooms designs are design factors that connects directly to the performance of lecturers in the educational system. These, factors are elements to collaborates and shape the occupational health and safety of workers. According to De Looze and Koningsved (2016) these results in the adoption of specific human body postures and the execution of movements, as well as some external forces on the

human body. It can be term the ergonomics of the human body and environmental designs. It deals with risk assessment and prevention of risk in the workplace. It was asserted that risk assessment is only the first step towards good working conditions.

- Cognitive Ergonomics and Instructional Curriculum

International Ergonomics Association, (2010) defines cognitive ergonomics as the scientific discipline that studies, evaluates and designs task, jobs, products, environments and systems and how they interact with human and their cognitive abilities. It is concerned with the mental processes, such as perception, memory, reasoning and motor response, as they affect interactions among humans and other elements of a system. Cognitive ergonomics is responsible for how work is done in the mind, meaning, the quality of work is dependent on the persons understanding of the situations. Situations could include the goals, means, and constraints of the work (Hollnagel, 2010). Cognitive ergonomics entails mental workload, decision making ability, skilled performance, human-computer interaction, human reliability, work stress and training as these may relate to human system design (International Ergonomics Association, 2010). Cognitive ergonomics studies cognition in work and operational settings, in order to optimize human well-being and system performance.

According to Kalakoski (2022) cognitive ergonomics is a discipline of making human-system interaction compatible with human cognitive abilities and limitations, particularly at work. The author asserted that in human system interaction, cognitive ergonomics focuses on mental processes, especially cognitive functions and psychological/behavioural level interactions. Thus, the focus and goal is to explain the nature of human abilities and limitations in information processing. Imperatively, cognitive ergonomics is an extension of instructional ability and performance, which is measured by capabilities in implementation of principles and practices, in this regards, curriculum implementation. According to kalakoski, Selinheimo, Valtonen, Turunen, Kapykangas, Ylisssi, Toivio, Jarnefelt, Hannonen and Paajanen (2020) in modern digitalized environments, the performance of work tasks relies heavily on cognitive functioning, that is the mental processes that are involved in information processing such as attention, working memory, decision-making and learning. Thus, these demands are notable in knowledge work jobs that require working with abstract knowledge and acquiring, creating and applying knowledge, as well as continuity on the job learning (Sorensen and Holman, 2014).

- Organizational Ergonomics and Implementation of Instructional Curriculum

Organizational ergonomics refers to the optimization of social systems, which involves organizational structure, policies and processes (Lucy, Jean, Sandro and Carolin 2012). According to Kramer (2009) organizational ergonomics focuses on optimizing socio-technical systems and organizing structures, policies and processes in order to maximize efficiency. Thus, the goal of organizational ergonomics is the attainment of a fully harmonized work system that ensures employee job satisfaction and commitment. It is also a study of significances of technology on human relationships, processes and institutions. Therefore, it plays interventional roles which include: workers' identification and resolving ergonomic concerns, improving total system processes in connection to industrialized value streams and decision-making processes and successful installation of safety measures as integral part of the organizational culture (Kramer, 2009). The author asserted that organizational ergonomics workplace adheres to the balance model: that is all systems interact and any change in one system impacts the other elements, and if all elements are not designed to work in confluence; safety, productivity, efficiency and quality will be affected. Invariably, organizational ergonomics is the impetus that propels the system which houses physical and cognitive ergonomics. It is therefore pertinent to state emphatically that implementing instructional curriculum can only be achieved in a system where is ergonomic structure is balanced. The connection between organizational ergonomics and implementation of instructional curriculum is in consonant with industrial relationship. This is because; no system can function effectively without harmony in connection to structure, policies and processes. In other words, it is a design for safety, productivity and health balance for the system.

- Ergonomics in Educational Institution

Ergonomics is a discipline concerned with the fundamental understanding of interactions among humans and other elements of a system. 'Ergonomics in educational institution deals with 'humans', those people that are in the system. These people in the system are students, teachers and others such as management staff, non-teaching staff, and stakeholders (such as out-sourced staff. According to the Occupational Safety and Health Academy (OSHA, 2017), ergonomics involves the design of workstations, work practices and workflow to fit the employees' capabilities. It also involves a design that reduces risk factors that may contribute to common work-related injuries and illnesses, such as sprains, strain and cumulative trauma disorders (CTDs). Ergonomics is also expressed as a holistic approach in which considerations of physical, cognitive, social, organizational, environmental and other relevant factors are considered to enhance the design and evaluation of tasks, jobs, products, environments and system in order to make them compatible with the needs, abilities and limitations of employees (International, Ergonomics Association. 2017). This new concept also shows that ergonomics is not limited to the improvement of individual employee alone but an improvement in organizational performance as well (Alzahrani, 2019). Workplace environment may give an impression over the working environment, as one enters the building, it may also boost or decreases staff reaction. The poor productivity, quality, and accidents resulting from human error, are directly attributed to poor ergonomics (Cooper and Kleiner, 2001).

- The Curriculum Ergonomics and Implementation

According to Choppin, Roth McDuffie, Drake, and Davis (2018), curriculum ergonomics concentrates on how curriculum materials impact the teachers' work, and how they can intentionally be designed to ease or direct the accomplishment of specific type of objective; thus, an emphasis on ergonomics investigates how educational programs' design can push instructors to change their use of curriculum resources and ultimately how they transform their instructional practices. Curriculum ergonomics looks into mingling design in the digital context by thinking about how the design of digital resources can help teachers to select and design tasks with special characteristics and sequencing that match teachers' planning(Morose, 2007). In other words, curriculum ergonomics is considered or look from its digital platform for implementation.

The main focus of curriculum ergonomics centers on the interaction between the design of curriculum and its usage. It is the connection between the work that teachers exercise to design instruction and the agency imparted by the resources, in that the resources have a great effect on educators' activities (Remillard, 2005, 2016). Moreover, the idea of resources is conceptualized as something to be altered by instructors according to the setting in which they educate(Ruthven, 2012). This calls for understanding of the resources to enhance effectiveness during implementation.

Curriculum design occurs in various phases and at different distances from classroom instruction. Remillard (2005) depict three stages: the printed curriculum including digital form; the proposed curriculum teachers plan and transform according to curriculum resources; and the assigned curriculum that is what actually happens in classrooms when lesson plans are implemented (Xu, Furie, Mahabhaleshwar, 'Suresh', &Chouhan, 2019). In short, curriculum ergonomics refers to teachers' capacity to use materials; the alignment design aims and examples of curriculum use; the manners in which curriculum materials impact teaching; and the ways curriculum materials push teachersto take up new types of teaching methods that dissolute boundary between plan and use (Choppin et al., 2018). It underscores how curriculum materials are important tools for teachers to use when designing instruction.

II. THEORETICAL FRAMEWORK

The theoretical framework that guides this study is the Normative Theory of Service (NTS) by Benner (2002) which states that knowledge and tools can be used in producing the service especially for optimizing it or planning improvements to it and these should be made sufficient to workers for maximum productivity. Thus, teaching and learning outcomes can be greatly optimized and utilized in the educational institutions if the facilities, equipment,

buildings, cognitive knowledge and the organizational structures are adequately provided and improved by designing and situating them in such a manner that they fit the health and safety of the end users.

If the teaching/learning environment lacks proper development and ergonomic attention from the onset, educational goals will not be achieved. Teaching and learning development can only be achieved where there are accessible facilities which are adequately harmless and appropriate for the users. It is therefore imperative that ergonomics of teaching and learning facilities consideration and standards are strictly adhered to in planning, implementation and maintenance of the facilities (Uche and Okata, 2015). The Nigerian colleges of education has received adequate funding from the TET Fund, that requires no excuse in terms of providing the appropriate and required facilities, environment and personnel that is capable of implementing instructional curriculum, bearing in global best practices. Physical, cognitive and organization consideration in relation to ergonomics of a system determines to a large extent the productivity and outcome of the performance of such system. Ergonomics is not a negligible factor in any academic system. Thus, this study will focus on assessment of educational ergonomics and implementation of instructional curriculum in Nigerian colleges of education.

Study Objective: The study is designed to assess educational ergonomics and the implementation of instructional curriculum in Colleges of Education, South-South Nigerian. Specifically, the study sought to:

1. Determine the impact of physical ergonomics on implementation of instructional curriculum in Colleges of Education, South-South, Nigeria.
2. Determine the impact cognitive ergonomics on implementation of instructional curriculum in Colleges of Education, South-South, Nigeria.
3. Determine the impact of organizational ergonomics on implementation of instructional curriculum in Colleges of Education, South-South, Nigeria.

- Research Questions

1. To what extent does physical ergonomics impact on the implementation of instructional curriculum in Colleges of Education, South-South, Nigeria.?
2. To what extent does cognitive ergonomics influenced the implementation of instructional curriculum in Colleges of Education, South-South, Nigeria.?
3. To what extent does organizational ergonomics influenced the implementation of instructional curriculum in Colleges of Education, South-South, Nigeria.?

Hypothesis

Ho1: There is no significant difference on the opinion of lecturers and students on the impact of educational ergonomic in the implementation of instructional curriculum in Colleges of Education, South-South, Nigeria.

III. RESEARCH METHODOLOGY

The study will adopt a descriptive survey design. The aim is to describe the state and status of educational ergonomics, ergonomic considerations of teaching and learning, and its implementation to enhance instruction curriculum objectives and development in colleges of education in Nigeria. The population of the study will comprise 5000 lecturers and students in the six selected colleges of education in South-South Nigeria. The Five Thousand (5000) lecturers and students will be drawn from different departments. This population will be divided into 40% and 60% for lecturers and students respectively. However, the sample size will comprised of 200 respondents which represents 40% of the population. On this basis therefore, each selected college of education will be represented by 40 respondents. That is, 16 lecturers and 24 students. A self-structured questionnaire will be designed to elicit information from the respondents, while physical assessment and interview will be conducted to support evidence of the questionnaire. The instrument will be titled: Educational Ergonomics and the implementation of instructional Curriculum Questionnaire (EEIICQ). The instrument will be subjected to content validity by experienced researchers in selected Colleges of education. Also, a reliability test was conducted using split-half method and person product moment

correlation coefficient which yieldeda reliability index0.75. The instrument will be administered by the researcher, and research assistants who were selected in the process of the study. These research assistants will be properly trained on the content and method of administration to eliminate bias and error data which is capable of diverting or deceiving the finding or result of the study. The collected data will be analyzed using correlative statistical tools of mean scores and standard deviation, while ANOVA was use to correlate the regression analysis subject to Statistical Package for the Social Sciences (SPSS) version 26.0.

IV. RESULTS AND DISCUSSION

- Respondents' Demographics

In this Report present to you, the demographic information of your respondents. This contains information such as specialization, and number of years in the institution.

Respondents' Occupations

S/N	Occupation	Count
1	Lecturer	64
2	Student	97
	Total	161

Years of experience/service

Yrs of experience	years of experience/Service
1 - 4	35
5 - 8	40
9 - 12	20
13 - 16	30
17 - 20	16
21 - 24	7
25 - 28	5
29 - 33	8
Total	161

Table 1. Mean rating on the extent of physical ergonomics impact on the implementation of instructional curriculum in Colleges of Education, South-South, Nigeria

S/N	Extent of physical ergonomics impact on the implementation of instructional curriculum	X	SD	Decision
1	All educational facilities in my school environment are adequate	2.29	0.72	D
2	Educational facilities in my school are easily accessed for instructional curriculum implementation	2.74	0.71	A
3	My school provides all required educational facilities for instructional curriculum implementation	2.41	0.74	D
4	My school provides facilities which support research, teaching and learning.	2.91	0.68	A
5	Educational facilities in my school are well designed for instructional curriculum implementation	2.62	0.74	A
6	Office/classroom furniture in my school is flexible to impact instructional curriculum implementation	2.72	0.76	A
7	Office/classroom in my school are sufficiently equipped for instructional curriculum implementation	2.34	0.78	D
8	Office/Classroom furniture is of high quality	2.31	0.86	D
9	Office/Classroom is sufficiently equipped for my typical needs	2.26	0.71	D
10	The suitable temperature in my office/classroom disturbs instructional curriculum implementation	2.40	0.79	D
11	The air quality in the office/classroom is suitable for instructional			A

	curriculum implementation	2.76	0.84	
12	The overall temperature of office/classroom is pleasant	2.60	0.85	A
13	There is proper ventilation in the office/classroom	2.66	0.90	A
14	The lighting in the office/classroom supports instructional curriculum implementation	2.66	0.84	A
15	I don't face any problems with lighting in the office/classroom	2.50	0.88	D
16	Office/classroom is provided with efficient lighting that is effective for productivity	2.53	0.88	A
17	Windows in the office/classroom provide natural light	3.26	0.63	SA
18	The office/classroom environment helps in completion of daily tasks easily	2.93	0.74	A
19	The office/classroom environment helps in completion of daily tasks on time	2.83	0.72	A
20	I am satisfied with my workplace environment	2.45	0.85	D
21	Workplace environment encourages work efficiency/effectiveness	2.84	0.83	A
22	Workplace environment boosts creativity/inspirations	3.00	0.83	A
23	Workplace environment enhances motivation/drives	2.97	0.83	A
24	Workplace environment affects productivity	3.31	0.65	SA
	Total Mean	2.68	0.78	

Source: Survey Data 2024

From the results in table 1, it is indicated that the impact of physical ergonomics on implementation of instructional curriculum in Colleges in South-South Nigeria in not very much. This finding is supported by total mean score of 2.68 which slightly higher that the lower limit boundary of 2.50. The item by item analysis showed that very many numbers where below mean score of 3.00. However, item 17, 22 and 24 had mean scores of 3.00 -3.31, which showed that physical ergonomics provide natural ventilation, improve creativity and enhance productivity. Therefore, it is concluded that physical ergonomics rarely impact on instructional curriculum implementation in Colleges of education in South-South, Nigeria.Uche andOkata, (2015) asserted that when work environments are ergonomically designed in such a way that the safety and health of the employees or the users are put into consideration, then it will become user friendly and enhance efficiency of work and productivity. Thus, physical ergonomics is very important in ensuring effective implementation of instructional curriculum.

Table 2. Mean rating on extent of cognitive ergonomics influenced the implementation of instructional curriculum in Colleges of Education, South-South, Nigeria

S/N	Extent of cognitive ergonomics impact on the implementation of instructional curriculum	X	SD	Decision
1	The curriculum design of the school programs are learners centred for effective instructional curriculum implementation	3.16	0.66	A

2	The school system is designed to ensure comprehension and compliance by both teachers and students	3.22	0.62	A
3	School trains and retrains teachers for effective instructional curriculum implementation	3.02	0.86	A
4	School encourages teachers to attend scholarship programs for effective instructional curriculum implementation	3.10	0.76	A
5	School equip the libraries with adequate and relevant reading materials for effective instructional curriculum implementation	1.98	0.76	D
6	School provides effective internet/e-book platform for effective instructional curriculum implementation	2.31	0.89	D
7	School provides functional interactive whiteboards for effective instructional curriculum implementation.	2.81	0.82	A
8	School system encourages full participation of both teachers and students in instructional curriculum implementation.	3.07	0.69	A
9	School system accommodate inputs from teachers and students for effective instructional curriculum implementation	2.88	0.62	A
10	The teachers' workload does not mitigate against effective performance	2.78	0.72	A
11	The school calendar is arranged to accommodate complete learning processes before exams	2.97	0.89	A
12	School provides students instructional guidelines	3.10	0.69	A
13	School appoints students' academic counselors	2.72	0.78	A
14	School system is designed to encourage interactions and sharing of ideas among individuals	3.14	0.71	A
15	School courses are allocated based on area of specializations	3.28	0.69	SA
16	School system encourages research and development among the teachers and students.	3.36	0.55	SA
	Total Mean	2.93	0.73	

Source: Survey Data 2024

From the results in table 2 , it is showed that the impact of cognitive ergonomics on implementation of instructional curriculum in Colleges in South-South Nigeria is moderately ok. This finding is supported by total mean score of 2.96 which is slightly higher that the lower limit boundary of 2.50. The item by item analysis showed that very many numbers where within the mean score of 3.00 and above. However, item 5 and 6 had mean scores of 1.98 and 2.31, which showed that reading materials and usage of the internet does not impact on instructional curriculum implementation. Therefore, it is concluded that cognitive ergonomics moderately impact on instructional curriculum implementation in Colleges of education in South-South, Nigeria. Sorensen and Holman, (2014) brought to the fore, the fact that cognitive ergonomics is a determining factor in the achievement of instructional curriculum implementation. This is because, instructional curriculum implementation requires to a large extent digitalized environment capabilities and work place balance in terms of knowledge, work related performance and system interactions.

Table 3. Mean Rating on the extent of organizational ergonomics influenced the implementation of instructional curriculum in Colleges of Education, South-South, Nigeria

S/N	Extent of organizational ergonomics impact on the implementation of instructional curriculum	X	SD	Decision
1	School employ enough teachers to cover instructional curriculum implementation	3.07	0.78	A
2	School employed qualified teachers to cover instructional curriculum implementation	3.02	0.78	A
3	School employ the services of consultants and professionals in curriculum design process	2.60	0.89	A
4	School policies are teachers, students and curriculum implementation oriented	3.12	0.70	A
5	School system provide instructional infrastructures for effective implementation of curriculum by teachers	2.97	0.69	A
6	School is technologically equipped for effective curriculum implementation	2.57	0.87	A
7	The workshops and studios are adequately equipped for practically oriented instructional delivery	2.48	0.88	D
8	The design of the school structure encourages mentorship in curriculum implementation	2.78	0.77	A
9	Workplace/classroomenvironment helps in completing my daily tasks easily	2.88	0.70	A
10	Workplace/classroomenvironment encourages work proficiently	2.81	0.80	A
11	Workplace/classroomenvironment boosts creativity and freedom to initiate positive directions	2.91	0.65	A
12	Workplace/classroomenvironment enhances motivation/drive	2.91	0.75	A
13	Workplace/classroomenvironment affects productivity positively	3.03	0.67	A
14	I am satisfied with my workplace environment and its designs	2.47	0.72	D
	Total Mean	2.83	0.70	

Source: Survey Data 2024

From the results in table 3, it is showed that the impact of organizational ergonomics on implementation of instructional curriculum in Colleges in South-South Nigeria is moderately high. This finding is supported by total mean score of 2.83 which is slightly higher that the lower limit boundary of 2.50. The item by item analysis showed that very many numbers where within the mean score of 3.2.60-3.07 and above. However, item 1,2,4 and 12 had mean scores of 3.02-3.07, which showed that there are qualified teachers, and the school policies are drawn to positive productivity which impact on instructional curriculum implementation. Therefore, it is concluded that organizational ergonomics moderately impact on instructional curriculum implementation in Colleges of education in South-South, Nigeria

Hypotheses Analysis

Table 4 Results of the tested Hypotheses

ANOVA

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	2.840	2	1.420	6.544	.002
Within Groups	37.106	171	.217		
Total	39.946	173			

Organizational and Cognitive ergonomics (p=0.148) are not significantly different. Also, Physical and Organizational ergonomics (p=0.194) are not significantly different. Cognitive and Organizational ergonomics (=2.91) has a significantly higher impact on the implementation of instructional curriculum than Physical and Organizational ergonomics (=2.76). This result implies an advance in the Cognitive and Organizational ergonomics would have higher impact on the implementation of instructional curriculum compared to a similar advance in Physical and Organizational ergonomics.The learning ergonomics had a significant impact on the implementation of instructional curriculum, $F(2, 171) = 6.54$, p=0.002. In other words, learning ergonomics such as physical, cognitive, and organizational significantly impacts the implementation of instructional curriculum.

Regression Analysis using Model Fitting Information

In performing these regression analysis, epeiiicMean, eceiiicMean, and eoeiiicMean were sequentially used as dependent variables while Gender was used as the factor.

Table 5

Model Fitting Information

Model	-2 Log Likelihood	Chi-Square	df	Sig.
Intercept Only	355.359			
Final	273.343	82.015	5	.000

The result shows that the p-values in the model fitting table is significant. Therefore, the Null hypotheses have to be rejected and there is a significant relationship between the intercept-only model and the final model.

Table 6

Model Fitting Information

Model	-2 Log Likelihood	Chi-Square	df	Sig.
Intercept Only	387.163			
Final	347.809	39.354	5	.000

The result shows that for your dataset, the p-values in the model fitting table is significant. Therefore, the Null hypotheses have to be rejected and there is a significant relationship between the intercept-only model and the final model.

Table 7

Model Fitting Information

Model	-2 Log Likelihood	Chi-Square	df	Sig.
Intercept Only	351.092			
Final	270.468	80.624	5	.000

The result shows that for your dataset, the p-values in the model fitting table is significant. Therefore, the Null hypothesis have to be rejected and there is a significant relationship between the intercept-only model and the final model

Respondents' Comments

This report, presents the summary of respondent comments from the three main ergonomics issues (physical, cognitive, and organization) related to their institution which you investigated.

A) Physical Design

In the respondents' opinion, physical design is an important aspect of school system design. The physical environment of a school can have a significant impact on the learning experience of students. Schools should be designed in a way that is welcoming and conducive to learning. For example, classrooms should be well-lit and have enough space for students to move around. The layout of the school should also be designed to encourage social interaction and collaboration. In addition, schools should be equipped with the latest technology to support learning. This includes computers, interactive whiteboards, and other tools that can make learning more engaging and effective.

B) Cognitive Design

In terms of cognitive design, the respondents suggested that schools should be designed to support the way that students learn. For example, research has shown that students learn best when they are actively engaged in the learning process. Therefore, schools should be designed with this in mind. Classrooms should be designed to allow for active learning, with plenty of opportunities for students to work together and collaborate. In addition, schools should provide students with a variety of learning experiences, including both individual and group work. This will help to keep students engaged and interested in the material. Finally, schools should use assessment techniques that are aligned with how students

The school environment should be such that can create an effective and cognitively rich learning environment that promotes knowledge acquisition, understanding, application, and retention.

V. CONCLUSION AND RECOMMENDATIONS

Ergonomics focuses on making workplace conditions fit for end users. It is the design of a working environment that is concerned with the appropriate conditions for individuals and their technical tools, which conserves their abilities and constraints in assuring that responsibilities are adequately carried out. The main focus of educational ergonomics is the prevention of harm to the lecturers and students' health and productivity. Physical, cognitive and organizational ergonomics are concerned with issues relating to human anatomy, workplace design, safety, and health. The results of this study showed that physical, cognitive and organizational ergonomics of colleges of education in South-South Nigeria are rarely and moderately impacting on the implementation of instructional curriculum. A proper learning environment based on ergonomic standards not only creates motivation and facilitates the learning process, but also guarantees the organizational health of schools. It is notable that poor environmental condition creates obstacles to educational development. Therefore, the study concludes that the educational ergonomics of colleges of education in South-South Nigeria needs to improve upon to enhance effective instructional curriculum implementation. The study therefore

recommends a reevaluation of the ergonomics of the colleges of education to adopt ergonomically best practices among league of global educational institutions. The most determining factor in any institution of learning is the holistic design of its ergonomics. A positively designed ergonomics will attract learning interest among students and will improve on lecturers' productivity in implementing instructional curriculum.

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