MANAGEMENT OF CHEMICAL HAZARDS FOR ACADEMIC STAFF PRODUCTIVITY IN PUBLIC UNIVERSITIES IN RIVERS STATE, NIGERIA

Lesi Elizabeth Saaronee Kaegon
Department of Educational Management
University of Port Harcourt, Rivers State, **NIGERIA**
E-mail: lesikaegon@uniport.edu.ng;
lesikaegon@yahoo.com

Vita, Barielnen
Army Day Secondary School
Bori-Camp, Port Harcourt, Rivers State, **NIGERIA**
E-mail: barryvee4God@gmail.com

ABSTRACT

This study examined management of chemical hazards for academic staff productivity in public universities in Rivers State. Two research questions and two hypotheses guided the study which adopted descriptive survey research design. The population of the study was the 2,400 academic staff in the three public universities (University of Port Harcourt, Port Harcourt, Rivers State University, Port Harcourt and University of Education, Rumuolumeni, Port Harcourt) in Rivers State. A sample of 240 academic staff representing 10% of the population was drawn via stratified random sampling technique. A questionnaire containing 14 items designed by the researchers was used for data collection. The questionnaire was titled; Management of Chemical Hazards for Academic Staff Productivity Questionnaire (MCHASPQ). The instrument was properly validated by experts in Educational Management and Measurement and Evaluation Departments of the University of Port Harcourt and tested for reliability through test-retest method using Pearson's Product Moment Correlation Coefficient Formular (r). A reliability index of 0.85 was obtained. Data collected were analysed using mean and standard deviation to answer the research questions while independent sample z-test was used to test the hypotheses at 0.05 alpha level of significance. The findings revealed among others that the strategies of managing chemical hazards for academic staff productivity in public universities in Rivers State include: provision of Personal Protective Materials (PPM); encouraging proper handling and labeling of chemicals and providing safety training to academic staff; management of chemical hazards for academic staff productivity is challenged by lack of adequate provision of protective equipment, inadequate maintenance of plants and equipment that emit poisonous gases and inadequate training of staff on the management of chemical hazards. Based on the findings, conclusion was drawn.

Keywords: Management, Chemical hazards, Academic staff Productivity and Public universities.

INTRODUCTION

Productivity is very important in every business organization. Staff productivity could be seen as the amount of work done per unit of time or more aptly as total work over total time worked by a staff. It explains the output of workers over a period of time when compared with the amount of resources employed. Academic staff are the teaching staff in the universities who are directly involved in teaching, research, community service, character moulding, knowledge creation and transfer among others. In the university system, academic staff include: professors, associate professors, senior lecturers and other teaching staff of lower hierarchy such as lecturers I & II and even graduate assistants. Academic staff productivity in the university system is enhanced by a number of factors such as proper reward system, good welfare

packages, adequate working environment, timely promotion, adequate provision of necessary working facilities, mentoring of newly recruited staff, Information and Communication Technology (ICT) training and compliance, participation in seminars, workshops and conferences as well as continuous in-service training for the workforce (Ogbuagu, 2016).

Academic staff productivity measures the aggregate output or total volume of work done by the lecturers in terms of research, teaching the students and other responsibilities which are directed towards producing the desired result in the educational system. The working environment and health conditions of academic staff significantly affect their productivity. The more healthy and strong they are, the more productive they become. It is therefore the statutory responsibility of management of public universities to create enabling work environment and promote the welfare of their staff in order to increase their productivity. One of the avenues of achieving this is by instituting adequate management of occupational hazards facing their work force.

Occupational hazard is regarded as any job condition, situation or anything that predisposes an individual to some kind of risks in the course of performing his duties (Vita, 2020). In line with this, Armstrong (2009) defined occupational hazard as anything that can cause harm (working on roofs, lifting heavy objects, chemical, electricity and so on) which involve risks attached to them. Occupational hazards are substances or circumstances that pose danger to human health or wellbeing, a situation liable to cause accident or diseases. Every occupation has hazards that are associated with it. Academic staff of universities are facing occupational hazards such as; disease transmission, use of chalk and chalkboards, sexual harassment, cultism, threats from students, practical work in laboratories, workshops and farms among others.

Institution authorities are expected to establish effective rules and regulations that will guide academic staff in managing occupational hazards confronting them in the discharge of their duties. Improving the quality of workplace or environment is necessary for promoting academic staff productivity. The university environment involves a lot of risks and hazards' factors making it necessary for university authorities and academic staff to mount surveillance on such factors that will negatively affect staff productivity.

Chemical hazards are substances capable of unleashing harm on workers. These are produced by the reaction of substances in a work process which leads to serious health issues. For example, through inhalation, ingestion and skin contact with poisonous substances. Management of chemical hazards does not mean to eliminate them from our schools but rather, it means to plan and set up procedures of controlling them in the work environment in order to mitigate their effects on productivity and safety of the academic staff. It is necessary to adopt best practices in work places especially laboratories, workshops as well as other places where academic staff are exposed to chemical hazards. The strategies in place currently for managing chemical hazards for academic staff productivity in public universities in Rivers State are not quite adequate. These writers are bothered by this ugly situation, hence, the motivation to carry out this study.

STATEMENT OF THE PROBLEM

The productivity of academic staff of universities is based on the time and efforts they put in quality research, teaching and community service which are the major goals of the university. The realizations of these goals are often impeded by some environmental factors or occupational hazards such as chemical hazards. The effect of these chemical hazards on human life is very dangerous, hence it negatively affect their productivity. This demands that priority

should be given to effective management of chemical hazards in order to enhance the productivity of academic staff in public universities in Rivers State.

The researchers are bothered by this situation which they conceive as a problem. Therefore, the problem of this study is to investigate the strategies for managing chemical hazards in public universities in Rivers State.

AIM AND OBJECTIVES OF THE STUDY

The aim of this study was to examine the management of chemical hazards for academic staff productivity in public universities in Rivers State. Specifically, the study had the following objectives;

1. to find out the strategies for managing chemical hazards for academic staff productivity in public universities in Rivers State.
2. to ascertain the challenges of managing chemical hazards for academic staff productivity in public universities in Rivers State.

RESEARCH QUESTIONS

The study was guided by the following research questions;

1. What are the strategies for managing chemical hazards for academic staff productivity in public universities in Rivers State, Nigeria?
2. What are the challenges of managing chemical hazards for academic staff productivity in public universities in Rivers State, Nigeria?

RESEARCH HYPOTHESES

The following hypotheses were tested at 0.05 level of significance;

Ho_1: There is no significant difference between the mean response of academic staff of state and federal universities in Rivers State on the strategies for managing chemical hazards for academic staff productivity in public universities in Rivers State, Nigeria.

Ho_2: There is no significant difference between the mean response of academic staff of state and federal universities in Rivers State on the challenges of managing chemical hazards for academic staff productivity in public universities in Rivers State, Nigeria.

THEORETICAL AND CONCEPTUAL LITERATURE REVIEW

The study derives its base from the two factor theory propounded by Fredrick Herzberg in (1959). The two factor theory is also known as the motivator-hygiene theory (Cole, 2006; Kpee, 2015). The theory states that there is a set of factors or job conditions that tend to result to high level of motivation and job satisfaction. Such factors are intrinsic in nature and highly related to the nature and content of job being performed. Herzberg (1959) in Kpee (2015) identified two groups of factors that may bring about satisfaction or dissatisfaction in work places. These are: motivators or satisfiers and hygiene or dissatisfiers. The earlier one refers to achievement, recognition, advancement, growth, responsibility and works itself. Their presence in workplaces cause a high level of motivation but their absence does not necessarily cause dissatisfaction. The later refers to company policies and administration, supervision, interpersonal relations with peers, working conditions, salary, status and job security. Hygiene factor/dissatisfiers are expected to be higher or equal to what prevails in organizations of similar nature.

Once employees discover that the hygiene factors are deficient in their own organization, in comparison to similar organizations, the employees will be unhappy, develop low morale to work and productivity in the organization and will be affected negatively. The two factor theory

is relevant to this study because motivation is a factor that academic staff need in the universities in order to realize organizational productivity. Academic staff can be satisfied and motivated in their work places with the organizational policy of managing occupational hazards. Their interpersonal relationship, workload, performance on the job and attitude to work change as a result of these. The otherwise is the case when these are dissatisfied with the conditions of service, remuneration, compensation, salaries/wages and occupational hazards incurred compared to other universities. They become unhappy and develop low morale to work, a situation that have negative impact to their productivity.

Chemical hazards are substances capable of unleashing harm on workers. So many new chemical substances are introduced into our work places especially now that we are in the technological age. The effect of some of them on human health is not yet known by their users. Chemical hazards are produced by the reaction of substances in work places which results to occupational hazards (poisoning). This may occur through inhalation, ingestion, skin contact among others. Inhalation of chemicals happen unknowingly due to constant exposure to high doses over a period of time. This is dangerous to human health and life. Jain and Rao (2014) grouped chemical hazards as:

1. a. Solids – This comprises of combustible/flammable substances such as wood, wool, paper and so on which can catch fire and burn easily.
   b. Toxic substances such as lead, mercury and other poisonous elements.
   c. Corrosive such as gun powder which is an explosive substance.
2. Liquids – such as methyl alcohol, kerosene, petrol and so on.
3. Gases – such as oxygen, hydrogen, chlorine, carbon monoxide and so on which are corrosive and explosive materials.

Chemical hazards are substances of chemical nature that constitute health hazards (Achalu, 2000). These include: dust, vapors, drugs, dyes, pesticides, solvent, carbon monoxide and fumes among others. Patibha and Anupama in Nwafor (2017) see chemical hazards as substances which when absorbed by the skin or when they are inhaled, the resultant effects are disastrous e.g. carbon monoxide, acetic acid, chalk dust, sulphuric acid. Uncontrolled chemical hazards in work places could result into accidents, health risk, slows down performance of the entire work process (Achalu, 2002).

Chemical hazards in work places could be managed for effective productivity through the following measures:

1. Provision of occupational health and safety training: Mato (2016) explained that health and safety training are key strategies of preventing occupational hazards for academic staff productivity; this type of training spells out the rules and provides information on hazards and how to avoid them; organizing occupational health and safety units in each department working with chemical is necessary, it is the role of the management in general and the unit managers in particular. Armstrong (2009) listed some specific roles of managers in the management of chemical hazards as:
   a. The development and implementation of occupational hazards, and health and safety policies. Undertaking risk assessments, safety audits, supervision and inspection of work places and procedures, and monitoring and evaluating occupational health and safety performances and taking corrective actions when necessary;
   b. Managers could exert greater influence on health and safety since they are in control of their departments and watch out for unsafe conditions or practices and take immediate actions.

c. Institution of occupational health and safety committee to deal with health and safety issues and also provide medical advice to workers.

The following methods according to Nwafor (2017:24) are useful in the management of chemical hazards:

a. Ventilation: This method is useful in controlling the atmosphere that is toxic or flammable through air supply to dilute the toxins to a safe level.
b. Administrative control: This is the managerial effort in hazard reduction through planning, training, informing and communicating hazards to others.
c. Proper use of Personal Protective Equipment (PPE) in protecting the human body against chemical splash, spill and so on to avoid injury. For instance, protecting areas such as; the eye, head, nose, skin, hands, legs and so on using coats, goggles, gloves, aprons, face masks among others.

In addition to the aforementioned strategies, Jain and Rao (2014:211-212) suggested the following strategies of managing chemical hazards in work places:

a. Handling/Storage: Storage and handling of chemicals should be done properly, especially when they are in bulk to avoid accidents. Chemicals are expected to be stored under the required temperature and space; and
b. Regular repair and maintenance of tools/instruments to help minimize accidents in work environments.

For the management of large dust particles, Ministry for the Environment (2016) and Jain and Rao (2014) added that; adequate monitoring/assessment of dust particles should be carried out where they are likely to cause adverse effects due to the scale of activity and sensitivity of the receiving environment; keeping distance from dust prone areas and materials; conducting dusty operations during weather conditions that minimize emission and covering dusty loads with the use of air purifiers; use of dust collection systems and filters; provision of surfaces that minimize accumulation of dust and regular cleaning of facilities.

Adequate management of chemical hazards in work places like public universities is impeded by a lot of factors. According to Armstrong (2009) and Jain and Rao (2014), hazardous processes and substances are not isolated from workers so that the workers do not come in contact with them; protective equipment are not provided, and even if provided, these are not changed regularly to completely remove the hazards; inadequate maintenance of plant and equipment that emit toxic/harmful substances are some of the challenges of managing chemical hazards for staff productivity in work environment.

Safe Work Australia (2015) noted the inadequate training of staff as part of the major challenge of managing occupational hazards in work places. According to them, the performance and productivity of staff is usually based on their level of experiences, training and skill. Therefore, there is need for adequate training of staff on the identification and approaches for controlling occupational hazards to meet global best practices. The Health and Safety Regulations (1981) in Safe Work Australia (2015) suggests that employees should be provided with adequate and appropriate equipment, facilities and training to understand why safety equipment should be used, where and how it should be used to protect them from hazards. A staff who knows how to recognize hazards can use his/her training experience to control the situation to avoid exposure to risk and unsafe conditions. This training is hardly provided to employees in most public universities in Nigeria.

Paucity of funds in public universities in Nigeria serves as a great challenge in the management of occupational hazards for academic staff productivity in these institutions. There is inadequate provision of; necessary facilities and equipment, capacity building programmes on

management of occupational hazards, occupational hazards policies and their implementation, health and safety facilities among others. Inadequate funding reduces the capacity of institutions to maintain existing facilities and acquire modern technical equipment required for increased productivity (Nwakudu, Boreh and Ogbara, 2014).

Lawrence (2012) supported the idea of teaching safety and health rules and regulations in schools as a means of managing occupational hazards and university authorities should formulate adequate occupational health and safety policies for their academic staff. Mato (2016:124) provided the following tips of managing occupational hazards for university authorities:

a. identify the likely health issues in every university and other establishments.
b. identify risk factors for the development of health and safety problems in the work place.
c. identify those likely to be at risk.
d. evaluate the risks
e. monitor and review the risk situations.

METHODOLOGY

This study adopted the descriptive survey research design. The population of the study was the 2,400 academic staff in the three public universities (two state universities (1,350) and one federal university (1,050)) in Rivers State. A sample of 240 academic staff (135 from state university and 105 from federal university) representing 10% of the population was drawn through the stratified random sampling technique. A questionnaire instrument containing 14 items designed by the researchers was used for data collection. The questionnaire was titled; Management of Chemical Hazards for Academic Staff Productivity Questionnaire (MCHASPQ). The instrument was properly validated by experts in the Departments of Educational management and Measurement and Evaluation and after the modified Likert scale model which had its reliability index established at 0.85 it was realized through the test-retest method and Pearson's Product Moment Correlation Coefficient Formular (r). Data obtained were analysed using mean and standard deviation to answer the research questions while independent sample z-test was used to test the hypotheses at 0.05 level of significance.

RESULTS

RESEARCH QUESTION 1: What are the strategies of managing chemical hazards for academic staff productivity in public universities in Rivers State?

TABLE 1: WEIGHTED MEAN AND STANDARD DEVIATION SCORES OF ACADEMIC STAFF OF STATE AND FEDERAL UNIVERSITIES ON THE STRATEGIES OF MANAGING CHEMICAL HAZARDS FOR ACADEMIC STAFF PRODUCTIVITY IN PUBLIC UNIVERSITIES IN RIVERS STATE.

S/N	Strategies for Managing Chemical Hazard Variables	Acad. Staff of State Univ. N = 135		Decision	Acad. Staff of Fed. Univ. N = 105		Decision
		$\bar{x}_1$	SD_1		$\bar{x}_2$	SD_2	
1.	University provides nose masks to prevent inhalation of poisonous gases, chalk dusts among others as a way of managing chemical hazards for academic staff productivity.	2.16	0.73	Disagreed	2.14	0.75	Disagreed
2.	University provides Personal Protective Material (PPM) such as laboratory coat during practicals as a way of managing risk of exposure to chemical spills.	2.87	0.72	Agreed	2.90	0.70	Agreed
3.	University encourages proper labeling of chemicals to provide necessary information as a way of managing human error during practical studies for academic staff productivity.	3.02	0.64	Agreed	3.01	0.65	Agreed
4.	Organizing/sponsoring safety training by the university is a strategy for managing risk associated to chemical hazards for academic staff productivity in your school.	2.96	0.67	Agreed	2.92	0.69	Agreed
5.	Proper handling of chemical substances in the laboratories/workshops is a way of minimizing risk of explosion during practical studies for academic staff productivity in your school.	2.98	0.66	Agreed	3.00	0.65	Agreed
6.	Ensuring proper use of Personal Protective Materials (PPM) such as laboratory coats, hand gloves, safety shoes and so on are ways of protecting the body against chemical splash/spills for academic staff productivity in your school.	3.14	0.59	Agreed	3.11	0.60	Agreed
7.	Providing properly positioned and ventilated laboratories/workshops are ways of managing concentration of gases/heat during practical studies for academic staff productivity in your institution.	3.10	0.62	Agreed	3.09	0.63	Agreed
	Aggregate mean and standard deviation	**2.89**	**0.66**		**2.88**	**0.67**	

Table 1 showed that item number 1 had mean score values of 2.16 and 2.14 for academic staff of state and federal universities respectively. These values were below the criterion mean of 2.50. Item 1 was disagreed on by the respondents as a strategy for managing chemical hazards for academic staff productivity in public universities in Rivers State. On the contrary, items number 2 to 7 had mean score values that were greater than the criterion mean of 2.50. Items number 2 to 7 were agreed on by the respondents as the strategies of managing chemical hazards for academic staff productivity in public universities in Rivers State.

The aggregate mean scores of 2.89 and 2.88 for state and federal universities academic staff indicated that, both of them have a common opinion on the strategies for managing chemical hazards for academic staff productivity in public universities in Rivers State. Therefore, in summary, academic staff in state and federal universities are in agreement on the strategies of managing chemical hazards for academic staff productivity in public universities in Rivers State. The strategies of managing chemical hazards for academic staff productivity in public universities in Rivers State include: provision of PPM such as laboratory coat during practicals, encouraging proper handling and labeling of chemicals, providing safety training, ensuring proper use of PPM such as laboratory coats, hand gloves and safety shoes, providing adequate information about chemical substance during practicals and providing properly ventilated/well

positioned laboratories/workshops as ways of managing concentration of gases/heat during practicals among others.

RESEARCH QUESTION 2: What are the challenges of managing chemical hazards for academic staff productivity in public universities in Rivers State?

TABLE 2: WEIGHTED MEAN AND STANDARD DEVIATION SCORES OF ACADEMIC STAFF OF STATE AND FEDERAL UNIVERSITIES ON THE CHALLENGES OF MANAGING CHEMICAL HAZARDS FOR ACADEMIC STAFF PRODUCTIVITY IN PUBLIC UNIVERSITIES IN RIVERS STATE.

S/N	Challenges of Managing Chemical Hazards Variables	Acad. Staff of State Univ. N = 135 $\bar{x}_1$	SD_1	Decision	Acad. Staff of Federal Univ. N = 105 $\bar{x}_2$	SD_2	Decision
8.	Lack of adequate provision of protective equipment.	2.93	0.61	Agreed	2.92	0.62	Agreed
9.	Inadequate maintenance of plant and equipment that emit toxic/harmful substances.	2.83	0.64	Agreed	2.85	0.63	Agreed
10.	Inadequate training of staff on the management of chemical hazards in work places.	3.02	0.59	Agreed	3.00	0.60	Agreed
11.	Inadequate funding of public universities.	2.62	0.71	Agreed	2.71	0.67	Agreed
12.	Lack of adequate risk assessment and monitoring unit in public universities.	3.24	0.53	Agreed	3.12	0.56	Agreed
13.	Inadequate enforcement of government health and safety policies in public universities.	3.18	0.57	Agreed	3.15	0.58	Agreed
14.	Poor commitment in reporting risk level encountered by academic staff forms part of the challenge in managing chemical hazards for academic staff productivity in public universities in Rivers State.	2.73	0.67	Agreed	2.95	0.61	Agreed
	Aggregate mean and standard deviation	**2.94**	**0.62**		**2.95**	**0.61**	

Table 2 showed that all the items had mean score values that are higher than the mean criterion of 2.50. All the items (8 to 14) were agreed on by the respondents as the challenges of managing chemical hazards for academic staff productivity in public universities in Rivers State. In summary, the aggregate mean scores of 2.94 and 2.95 for academic staff of state and federal universities respectively indicated that the respondents had a unanimous opinion on the challenges of managing chemical hazards for academic staff productivity in public universities in Rivers State.

The challenges of managing chemical hazards for academic staff productivity in public universities in Rivers State therefore include the following: lack of adequate provision of protective equipment, inadequate maintenance of plants and equipment that emit toxic substances, inadequate training of staff on the management of chemical hazards, paucity of funds, inadequate risk assessment and monitoring unit in public universities, poor enforcement of government health and safety policies in public universities and poor commitment in reporting risk level encountered by academic staff in public universities in Rivers State.

TEST OF HYPOTHESES

HYPOTHESIS ONE: There is no significant difference between the mean response of academic staff of state and federal universities in Rivers State on the strategies for managing chemical hazards for academic staff productivity in public universities in Rivers State, Nigeria.

TABLE 3: Z-TEST ANALYSIS OF THE MEAN SCORES OF ACADEMIC STAFF OF STATE AND FEDERAL UNIVERSITIES IN RIVERS STATE ON THE STRATEGIES FOR MANAGING CHEMICAL HAZARDS FOR ACADEMIC STAFF PRODUCTIVITY IN PUBLIC UNIVERSITIES IN RIVERS STATE, NIGERIA.

Academic Staff	n	$\bar{x}$	SD	Df	z-Cal	z-Critical	Level of Sig.	Decision
State	135	2.89	0.66	238	0.12	±1.96	0.05	Ho_1 Retained
Federal	105	2.88	0.67					

Table 3 showed that academic staff of state and federal universities had mean scores of 2.89 and 2.88 and standard deviation of 0.66 and 0.67.with a degree of freedom of 238, the calculated z-test value of 0.12 is by far less than the z-critical value of ±1.96. The null hypothesis is therefore retained. This implies that, there is no significant difference between the mean response of academic staff of state and federal universities on the strategies for managing chemical hazards for academic staff productivity in public universities in Rivers State.

HYPOTHESIS TWO: There is no significant difference between the mean response of academic staff of state and federal universities in Rivers State on the challenges of managing chemical hazards for academic staff productivity in public universities in Rivers State, Nigeria.

TABLE 4: Z-TEST ANALYSIS OF THE MEAN SCORES OF ACADEMIC STAFF OF STATE AND FEDERAL UNIVERSITIES IN RIVERS STATE ON THE CHALLENGES OF MANAGING CHEMICAL HAZARDS FOR ACADEMIC STAFF PRODUCTIVITY IN PUBLIC UNIVERSITIES IN RIVERS STATE, NIGERIA.

Academic Staff	n	$\bar{x}$	SD	Df	z-Cal	z-Critical	Level of Sig.	Decision
State	135	2.94	0.62	238	0.16	±1.96	0.05	Ho_2 Retained
Federal	105	2.95	0.61					

Table 4 revealed that academic staff of state universities had mean score and standard deviation of 2.94 and 0.62, while academic staff of federal university had mean score and standard deviation of 2.95 and 0.61 with a degree of freedom of 238, the z-calculated value of 0.16 is far less than the critical z-value of ±1.96. The null hypothesis is therefore retained. This shows that, there is no significant difference between the mean response of academic staff of state and federal universities on the challenges of managing chemical hazards for academic staff productivity in public universities in Rivers State, Nigeria.

DISCUSSION OF FINDINGS

The findings of the study indicated that the strategies of managing chemical hazards for academic staff productivity in public universities in Rivers State include: provision of Personal Protective Materials (PPM) such as laboratory coat during practicals, encouraging proper handling and labeling of chemicals, providing safety training, ensuring proper use of PPM, providing adequate information about chemical substances during practicals and providing properly ventilated/well positioned laboratories/workshops as ways of managing concentration of gases/heat during practicals. These suggestions are in line with Jain and Rao (2014), Mato

(2016) and Armstrong (2009) that ventilation can be used in controlling the atmosphere that is toxic or flammable through air supply or exhaustion to dilute the toxic substances to a safe level, adequate supply and proper use of personal protective materials to protect human body against chemical splash, spill to avoid injury. Such materials include: use of eye googles, hand gloves, face masks and so on.

Ministry of Environment (2016), Nwafor (2017) and Armstrong (2009) noted that adequate monitoring and assessment of dust particles, conducting heavy dust operations during weather conditions that minimize dust emission and providing frequent medical advice on preventive measures are strategies of managing chemical hazards. Exposure of academics to inhalation of chalk dust at work and pollution of various kinds are chemical hazards facing academic staff productivity which causes breathing disorders, skin burns, health instability if they are not properly managed.

Equally of great importance is the training of academic staff on proper handling of different kinds of chemical substances, appropriate labeling and storage of these chemicals, proper method of diluting and mixing chemicals, warning signs, color code among others are necessary knowledge required by academic staff in all faculties and particularly those in the sciences for teaching students in laboratories and workshops and they also serve as strategies of managing chemical hazards for academic staff productivity in public universities in Rivers State. Supporting this, Vita (2020) revealed that, the management of chemical hazards for academic staff productivity is challenged by: lack of adequate provision of protective materials, inadequate maintenance of plants and equipment that emit toxic substances, inadequate training of staff on the management of chemical hazards, paucity of funds, inadequate risk assessment and monitoring units in public universities, poor enforcement of government health and safety policies and poor commitment in reporting risk level encountered by academic staff in public universities in Rivers State.

These findings agreed with Safe Work Australia (2015), Nwakudu, Boreh and Ogbara (2013), Mato (2016), Lawrence (2012) and Jain and Rao (2014) that in their respective studies, these scholars identified lack of adequate training, pre-employment training and orientation on the management of chemical hazard as a serious challenge confronting its management in public universities in Rivers State. Also, paucity of funds for the provision of necessary safety and health facilities required for the management of chemical hazards and proper maintenance of plants and equipment that emit poisonous gases in these universities is another challenge. Paucity of funds adversely affects the implementation of health and safety policies in these institutions adequately, thus giving room to high exposure of academic staff to serious chemical hazards and risks. Administrators of public universities in Rivers State should enforce government safety policies and regulations adequately to ensure that chemical hazards are well managed for enhanced productivity of academic staff in public universities in Rivers State.

CONCLUSION

Administrators of public universities in Rivers State in their management strategies of chemical hazards for academic staff productivity should enforce government safety policies and regulations in accordance with basic measures, global practices and using modern technologies and are also faced with many challenges which must all be surmounted by all the stakeholders in education.

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REFERENCES

Achalu, E. I. (2000). Occupational health and safety. Port Harcourt: Simarch.

Achalu, E. I. (2002). Occupational stress: Your job can be dangerous to your health. *Nigerian School Health Journal*, 2(1), 42-48.

Armstrong, M. (2009). *Armstrong's handbook of human resource management practice (11th Edition)*. London and Philadelphia: Kogan Page.

Cole, L. (2006). *Organizational behaviour*. London: Eaglewood Cliff.

Jain, R. K. & Rao, S. S. (2014). *Industrial safety, health and environment management systems.* New Delhi: Khana.

Kpee, G. G. (2015). *Theories and theoretical frameworks*: The researcher's handbook. Owerri: Uzopietro.

Lawrence, A. S. (2012). School environment and academic achievement of pupils. *Journal of Education and Instructional Studies*, 2(3), 204-216.

Mato, C. N. (2016). Managing health issues in the workplace in Nigeria in the 21st century. *African Journal of Educational Researcher and Development* (*AJERD*), 8(2), 10-20.

Ministry for the Environment (2016). Good practice guide for assessing and managing dust. Wellington: Ministry for the Environment, Manatu, New Zealand.

Nwafor, A. U. (2017). *Occupational hazards among oil servicing company workers in Rivers State, Nigeria*. Unpublished M.Ed Dissertation, University of Port Harcourt: Department of Human Kinetics.

Nwakudu, G. N.; Boreh, L. & Ogbara, I. (2014). Paucity of academics and funding: Implication for university education in Nigeria. *African Journal of Higher Education Studies and Development (AJHESD)*, Conference Edition, 2(3), 49-61.

Ogbuagu, J. C. (2016). Motivation and incentives for increasing productivity in educational institutions. In S. O. Oluwuo & J. D. Asodike (Eds.) *Managing schools for productivity: Emerging perspectives*. (10 – 16). Port Harcourt: Pearl.

Safe Work Australia (2015). Participation and productivity through healthy and safe work places that minimize the impact of harm. (Accessed 6th January, 2020). Available from World Wide Web: https://www/comcare.gov.au.

Vita, B. (2020). *Management of occupational hazards for academic staff productivity in public universities in Rivers State*. Unpublished Ph.D Thesis: University of Port Harcourt: Department of Educational Management.