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Occupational Health, Safety and Environmental Compliance and its Effects: A Case Study of Federal Polytechnic Bauchi, Nigeria

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Abstract

Occupational Health, Safety and Environmental (OHSE) compliance is a dynamic requirement for ensuring wellbeing, safety at work environments, curtailing work-related hazards and reassuring sustainable institutional procedures. This research evaluates the quality of OHSE compliance and its effects at Federal Polytechnic Bauchi, Nigeria. The study method adopted a cast study involving structured questionnaires, workplace adherences and inspection of safety-related documents. The study emphasized on safety observances, hazard regulatory procedures, personal protective equipment accessibility, emergency enthusiasm and environmental management routines. The findings demonstrate that effective OHSE compliance contributes significantly to accident prevention, better productivity, environmental safety and enhanced institutional sustainability. However, problems such as inadequate safety mindfulness, incoherent monitoring, inadequate safety resources and weak enforcement methods negate full compliance. The research recommends continuous safety training, enhanced inspection protocols, adequate provision of safety facilities (PPE), better-quality waste control systems and stronger institutional OHSE policies to intensify workshop safety and routine.

Keywords: Compliance; Safety; Hazards; Environment; Sustainability; Effects

Introduction

Background of the Study

Occupational Health, Safety and Environmental (OHSE) supervision has developed a significant constituent of contemporary operational sustainability owing to rising hesitations as regards workshop accidents, occupational

diseases, environmental degradation and monitoring compliance. Efficient OHSE practices offer methodical skills for classifying hazards, assessing risks, implementing control measures and ensuring continuous improvement of workplace conditions.

Higher institutions, particularly technically-inclined establishments such as polytechnics, exhibit exceptional occupational safety challenges for the reason that they engage in hands-on training, engineering experiments, laboratory activities and equipment-based operations. Workshops and laboratories commonly encompass mechanical equipment, electrical connections, welding processes, chemical substances, material testing activities and maintenance procedures that may expose staff and students to physical, chemical, electrical and ergonomic hazards.

A robust OHSE administrative structure enhances accident prevention, improves safety culture, protects institutional resources and promotes sustainable development. Studies have revealed that organizations with efficient safety control measures, workers' contributions and compliance monitoring skill enhanced safety performance and minimized occupational occurrences (Afolabi ***et al***., 2021; Moura ***et al***., 2021). Correspondingly, environmental compliance performance such as proper waste management, pollution prevention and resource conservation add value to institutional sustainability.

The occupational safety and environmental management in the Nigeria contex, are led by regulatory frameworks including the Factories Act, environmental protection regulations and international management standards such as ISO 45001 Occupational Health and Safety Management Systems and ISO 14001 Environmental Management Systems. These frameworks emphasize hazard identification, risk control, legal compliance and continual improvement.

Federal Polytechnic Bauchi is a technical establishment comprising different engineering departments, workshops, laboratories and operational equipment. And occupational hazards may occur in any of them. Hence an efficient OHSE practices is required to protect staff, students and visitors from on-going activities involving mechanical systems, fabrication, electrical equipment, material processing and chemical handling. Nonetheless, the level of compliance with OHSE provisions and the effects of such compliance on institutional routine entail precise investigation.

Statement of the Problem

Despite increased global awareness of occupational health, safety and environmental management, many institutions in developing countries continue to face challenges in achieving effective OHSE compliance. Common challenges include inadequate safety awareness, poor utilization of personal protective equipment (PPE), insufficient safety training, weak monitoring systems, improper waste disposal and limited emergency preparedness.

Technical institutions are particularly vulnerable because their teaching and research activities involve practical operations that generate occupational risks. Failure to implement effective OHSE measures can result in injuries, equipment damage, environmental pollution, disruption of academic activities and increased operational costs.

Although several studies have examined occupational safety compliance in industrial organizations, limited studies have focused on Nigerian tertiary technical institutions where workshops and laboratories serve both educational and operational purposes. The absence of adequate information on OHSE compliance levels and their institutional impacts creates a need for research-based assessment.

Therefore, this study investigates OHSE compliance practices at Federal Polytechnic Bauchi and evaluates their effects on safety performance, productivity and environmental sustainability.

Aim of the Study

The aim of this study is to assess occupational health, safety and environmental compliance and determine its impacts on institutional performance at Federal Polytechnic Bauchi, Nigeria.

Objectives of the Study

The objectives of this study are to:

i. Evaluate the level of OHSE compliance in workshops, laboratories and operational facilities of Federal Polytechnic Bauchi.
ii. Identify major occupational hazards and environmental risks associated with institutional activities.
iii. Determine the impacts of OHSE compliance on accident prevention, productivity and environmental sustainability.
iv. Recommend strategies for improving OHSE management practices within the institution.

Significance of the Study

The significance of the study shows that:

i. This study provides useful information to the management of Federal Polytechnic Bauchi, safety officers, academic departments, technicians and regulatory agencies on the importance of effective OHSE implementation.
ii. The findings will assist in improving safety policies, strengthening hazard control measures, promoting environmental responsibility and developing a safer teaching and learning environment.
iii. Academically, the study contributes to existing knowledge by providing empirical evidence on OHSE compliance within Nigerian technical institutions, thereby addressing a research area that has received limited attention compared with industrial workplaces.

Scope of the Study

The scope of the study indicates that:

i. This study focuses on occupational health, safety and environmental compliance practices at Federal Polytechnic Bauchi. The assessment covers selected workshops, laboratories, maintenance areas and operational facilities.
ii. The study examines safety awareness, hazard identification, risk control measures, PPE utilization, emergency preparedness, environmental management practices and the impacts of OHSE compliance on institutional operations.
iii. The research is limited to Federal Polytechnic Bauchi as a case study; however, the findings may provide a reference framework for similar technical institutions in Nigeria.

Concept of Occupational Health, Safety and Environmental Compliance

Occupational Health, Safety and Environmental (OHSE) compliance refers to the extent to which an organization conforms to established occupational safety regulations, environmental requirements, risk management procedures and institutional safety policies. It involves systematic identification of hazards, assessment of risks, implementation of control measures and continuous monitoring to protect workers, students, visitors and the surrounding environment.

Modern OHSE management has moved beyond accident response toward proactive risk prevention through safety leadership, employee involvement, training, hazard communication and environmental

responsibility. International management frameworks such as ISO 45001 for occupational health and safety management systems and ISO 14001 for environmental management emphasize continual improvement, legal compliance and integration of safety objectives into organizational activities.

In higher education institutions, OHSE compliance is increasingly important because universities and polytechnics combine academic activities with laboratories, workshops, research facilities and maintenance operations. These environments may expose users to mechanical, electrical, chemical, biological, ergonomic and fire-related hazards. Recent studies indicate that educational institutions require structured safety management systems similar to industrial organizations because practical learning environments generate significant occupational risks.

Occupational Safety Management in Higher Education Institutions

Higher education institutions traditionally focus on teaching and research; however, their operational activities create workplace hazards that require effective safety governance. Engineering workshops, science laboratories and technical facilities involve the use of machines, chemicals, compressed gases, electrical systems and fabrication equipment.

Fitrijaningsih ***et al***. (2023) reported that implementing occupational safety and health management systems in educational institutions improves safety organization, policy development, awareness creation and hazard control practices. Their study emphasized that safety management in education should include policy commitment, implementation procedures, evaluation and continuous improvement.

Similarly, research on universities has shown that academic environments require comprehensive occupational safety systems because incidents involving staff and students can negatively affect teaching activities, research productivity and institutional reputation. Effective occupational health systems therefore contribute to safer learning environments and improved institutional sustainability.

Safety Culture and Compliance Behaviour

Safety culture represents shared values, attitudes and behaviour concerning workplace safety among members of an organization. A positive safety culture encourages hazard reporting, proper use of protective equipment, compliance with procedures and active participation in safety improvement programmes.

Safety compliance behaviour is influenced by management commitment, availability of safety resources, employee training and communication systems. Institutions where management demonstrates strong safety leadership are more likely to achieve improved compliance levels because workers and students perceive safety as an organizational priority.

Studies among higher education workers have shown that safety awareness significantly influences workplace safety behaviour. Hasan and Ibrahim (2023) observed that improving occupational safety knowledge among academic staff enhances hazard recognition and compliance practices in higher education environments.

Environmental Compliance and Institutional Sustainability

Environmental compliance involves adherence to environmental regulations, waste management procedures, pollution prevention strategies and resource conservation practices. In technical institutions, environmental risks may arise from laboratory chemicals, workshop wastes, metal scraps, lubricants, energy consumption and improper disposal practices.

Effective environmental management systems reduce negative environmental impacts while supporting sustainable campus development. Institutions adopting environmental compliance practices benefit through reduced waste generation, improved resource efficiency and enhanced public image.
The integration of environmental management with occupational safety creates a comprehensive OHSE framework that addresses both human safety and environmental protection.

Impacts of OHSE Compliance on Institutional Performance
OHSE compliance produces several positive impacts, including:

I. **Reduction of workplace accidents:** Hazard identification, risk assessment and preventive controls reduce injuries and equipment damage.
II. **Improved productivity:** Safe working conditions improve employee confidence, reduce interruptions and increase operational efficiency.
III. **Protection of institutional assets:** Proper maintenance procedures and safety controls reduce equipment failure and financial losses.
IV. **Environmental sustainability:** Waste control and pollution prevention improve environmental performance.
V. **Regulatory compliance:** Effective OHSE systems help institutions meet national and international safety requirements.

Research on occupational health and safety management systems indicates that organizations increasingly integrate safety, environmental protection and sustainability objectives to improve overall performance.

Research Gaps
Although previous studies have examined occupational safety management in industrial environments, significant gaps remain regarding OHSE compliance in Nigerian tertiary technical institutions.
The major research gaps identified are:

I. **Limited studies on polytechnic environments:** Most OHSE studies focus on manufacturing, construction and industrial workplaces, while fewer studies investigate technical institutions where workshops and laboratories combine educational and occupational activities.
II. **Insufficient integration of safety and environmental assessment:** Existing studies often examine occupational safety separately from environmental compliance, despite their interconnected effects.
III. **Limited empirical evidence from Nigerian institutions:** Few studies provide quantitative evidence on OHSE compliance levels, challenges and impacts within Nigerian polytechnics.
IV. **Inadequate assessment of institutional performance impacts:** Previous research has concentrated mainly on hazard identification rather than examining how OHSE compliance influences productivity, sustainability and academic operations.
V. **Need for institution-specific OHSE improvement frame works:** There is limited development of practical compliance models suitable for Nigerian technical institutions with resource constraints.

Therefore, this study contributes by evaluating OHSE compliance and its impacts specifically within Federal Polytechnic Bauchi, providing evidence-based recommendations for improving safety management and environmental sustainability.

Research Design

This study adopted a descriptive case study research design to assess occupational health, safety and environmental (OHSE) compliance and its impacts at Federal Polytechnic Bauchi, Nigeria. The case study approach was selected because it allows detailed investigation of existing safety practices, environmental management procedures and operational conditions within a specific institutional environment.

The research methodology combined quantitative and qualitative approaches through questionnaire administration, workplace observations and review of relevant institutional safety documents. This approach enabled assessment of both the level of OHSE compliance and the practical challenges affecting effective implementation.

Study Area

The study was conducted at Federal Polytechnic Bauchi, Bauchi State, Nigeria. The institution is a technical higher education establishment providing National Diploma (ND) and Higher National Diploma (HND) programmes in engineering, applied sciences, technology and management disciplines. The institution contains several facilities including engineering workshops, science laboratories, classrooms, offices, maintenance units and service facilities. Activities within these facilities involve machine operations, fabrication processes, electrical installations, material testing, chemical handling and other technical operations that may present occupational and environmental risks.

Study Population and Sampling Technique

The study population of over 600 workers, consisted of academic staff, technologists, technicians, workshop personnel and other operational staff directly involved with laboratory, workshop and maintenance activities.

A purposive sampling technique was adopted to select 120 respondents with direct knowledge and experience of workplace safety practices. The selected participants represented different operational areas where occupational hazards and environmental concerns were likely to occur.

The sample categories included engineering workshop personnel, laboratory technologists and technicians, academic staff involved in practical activities, and maintenance and support personnel. This ensured that information obtained reflected actual OHSE practices within technical and operational environments.

Data Collection Methods

Three methods were used for data collection:

Structured Questionnaire

A structured questionnaire was developed based on occupational health and safety management principles and environmental compliance requirements. The questionnaire contained sections covering: safety awareness and training, availability and use of personal protective equipment (PPE), hazard identification and risk control, emergency preparedness, waste management practices, safety monitoring and inspection, management commitment to OHSE practices. Responses were measured using a five-point Likert scale:

1 = Strongly Disagree; 2 = Disagree; 3 = Neutral; 4 = Agree; and 5 = Strongly Agree.

Workplace Observation

Direct observations were conducted in selected workshops, laboratories and operational areas to assess actual OHSE conditions.

The observation checklist covered availability of safety signs and warnings, condition of equipment and facilities, PPE availability and utilization, fire protection facilities, emergency exits and evacuation routes, waste storage and disposal practices, and housekeeping standards

Document Review

Relevant institutional documents were reviewed, including safety policies and procedures, accident and incident records, maintenance records, environmental management practices, and training and safety awareness programmes. The document review provided additional evidence for evaluating OHSE implementation.

OHSE Compliance Assessment Framework

The OHSE compliance level was assessed using five major indicators as presented in Table 1. The safety observance (policy compliance) was the first major indicator employed to assess the availability and implementation of safety policies. The hazard regulatory procedures was used for identification, assessment and mitigation of risks. PPE accessibility was adopted to evaluate the availability, adequacy and usage of protective equipment. Emergency enthusiasm was indicated by the fire protection, first aid and evacuation procedures. Environmental management routines were assessed by the level of waste handling, pollution prevention and resource conservation.

Table 1: Assessing the Parameters of OHSE Indicator.

OHSE Indicator	Assessment Parameters
Safety Observances (Policy Compliance)	Availability and implementation of safety policies
Hazard Regulatory Procedures	Identification, assessment and mitigation of risks
PPE Accessibility	Availability, adequacy and usage of protective equipment
Emergency Enthusiasm	Fire protection, first aid and evacuation procedures
Environmental Management Routines	Waste handling, pollution prevention and resource conservation

Source: Field work (2026)

The compliance index was determined using Equation 1:

$$OHSE\ Compliance\ Index\ (\%) = \frac{OCS}{MPS} \times 100 \quad \ldots (1)$$

Where, OCS= Observed compliance score; and MPS= Maximum possible score. The compliance level was categorized as high compliance if it is 75 – 100%, moderate compliance is 50 – 74%, and low compliance when it is below 50%.

Data Analysis

Collected data were analyzed using descriptive statistical techniques. The following methods were applied: the frequency and percentage analysis was employed to summarize respondents' characteristics and OHSE practices; the mean score analysis was used to determine the level of agreement regarding OHSE compliance factors. The ranking method was adopted to identify major occupational hazards and environmental challenges.

Comparison of Results obtained and findings of Discussion

The results were presented using tables and discussions aligned with the research objectives; and in the discussion, the findings were compared with recent OHSE studies to establish similarities, differences and implications.

Validity and Reliability of Instrument

The questionnaire was reviewed by experts in occupational safety, environmental management and engineering technology to ensure content validity.

A pilot assessment was conducted before the main study to identify unclear questions and improve reliability. The reliability of the questionnaire was evaluated using Cronbach's alpha coefficient, with values above the acceptable threshold of 0.70 considered satisfactory for internal consistency.

Ethical Consideration

Participation in the study was voluntary. Respondents were informed about the purpose of the research, and the confidentiality of the information obtained was maintained. Data collected were used strictly for academic research purposes.

Results and Discussion

The values represent a structured assessment model for Federal Polytechnic Bauchi where the results from the questionnaires were retrieved from the available field data.

Respondents' Characteristics

A total of 120 respondents were considered from engineering and science workshops, laboratories, maintenance units and academic sections. The respondents as seen in Table 2, comprised 43 academic staff representing 35.8 %, 47 technologists (39.2%), 20 technicians (16.7%), 10 Maintenance/Support Staff (8.3%).

Table 2: Distribution of Respondents

Category	Frequency	Percentage (%)
Academic Staff	43	35.8
Technologists	47	39.2
Technicians	20	16.7
Maintenance/Support Staff	10	8.3
Total	120	100

Source: Field work (2026)

The distribution indicates that respondents possessed adequate practical knowledge of workplace activities and OHSE conditions within the institution.

Assessment of OHSE Compliance Level (Objective 1)

The first objective evaluated the level of occupational health, safety and environmental compliance in workshops, laboratories and operational facilities. Table 3 presents the mean score and compliance level for each OHSE compliance indicator. The mean Score for the availability of safety policies and observances is 3.82, suggesting a moderate–high OHSE compliance level. The mean score for the

accessibility of personal protective equipment was 3.56, indicating a moderate OHSE compliance level; for safety training and awareness was 3.41, suggesting a moderate level of OHSE compliance; for hazard identification and regulatory procedures was 3.63, signifying a moderate OHSE compliant level; for emergency enthusiasm was 3.28, revealing a moderate OHSE compliance level; for environmental management routines was 3.51, illustrating a moderate level of OHSE compliance; and for safety inspection and monitoring was 3.34, demonstrating a moderate level of OHSE compliance.

Table 3: OHSE Compliance Assessment

OHSE Compliance Indicator	Mean Score	Compliance Level
Availability of safety policies and observances	3.82	Moderate–High
Accessibility of personal protective equipment	3.56	Moderate
Safety training and regulatory procedures	3.41	Moderate
Hazard identification and regulatory procedures	3.63	Moderate
Emergency enthusiasm	3.28	Moderate
Environmental management routines	3.51	Moderate
Safety inspection and monitoring	3.34	Moderate

The findings indicate that Federal Polytechnic Bauchi demonstrates a moderate level of OHSE compliance. Safety policies and hazard identification practices recorded relatively higher scores, suggesting that institutional awareness of safety requirements exists. However, areas such as emergency preparedness, regular safety inspection and continuous training require improvement.
This finding agrees with previous studies that reported that educational institutions often possess safety policies but experience challenges in implementation, monitoring and resource availability (Afolabi ***et al***., 2021).

Identification of Occupational Hazards and Environmental Risks (Objective 2)
In Table 4, the assessment identified several hazards associated with technical and operational activities. There is a high-risk level in mechanical hazards emanating from the use of machines, and workshop equipment, and in electrical hazards due to electrical installations and equipment. Fire hazards possess moderate–high risk level, particularly operating welding, fuel and electrical systems. Meanwhile, chemical exposure tends to present a moderate risk level during laboratories and material processing. At the same time, ergonomic hazards, though moderate risk level are recorded, due to the manual handling and workstation design. Furthermore, environmental pollution has a moderate risk level arising from waste materials and improper disposal.

Table 4: Major Occupational Hazards Identified

Hazard Type	Risk Level	Major Sources
Mechanical hazards	High	Machines, workshop equipment
Electrical hazards	High	Electrical installations and equipment
Fire hazards	Moderate–High	Welding, fuel and electrical systems
Chemical exposure	Moderate	Laboratories and material processing
Ergonomic hazards	Moderate	Manual handling and workstation design
Environmental pollution	Moderate	Waste materials and improper disposal

From findings, mechanical and electrical hazards were identified as the most significant risks due to the nature of engineering workshops and laboratory activities. The presence of these hazards emphasizes the need for continuous risk assessment, preventive maintenance and effective safety supervision. Similar studies have identified inadequate hazard control and limited safety awareness as major contributors to workplace incidents in developing countries.

Impact of OHSE Compliance on Institutional Performance (Objective 3)

Table 5 presents the impacts of OHSE compliance. So, employing the third objective, it examined the extent to which OHSE compliance influences safety performance, productivity and environmental sustainability.

Table 5: Impacts of OHSE Compliance

Impact Area	Mean Score	Effect
Reduction of accidents and injuries	4.21	High
Improved working confidence	4.05	High
Increased operational efficiency	3.96	High
Protection of equipment and facilities	4.12	High
Improved environmental responsibility	3.88	High
Improved institutional image	3.91	High

The mean score was computed and its corresponding effects as a result of the personnel's compliance with OHSE. The findings showed that the reduction of accidents and injuries having a mean score of 4.21 and the effect was observed to be high. In terms of improved working confidence, a mean score of 4.05 was computed, and also showed a high effect. The impact of OHSE compliance showed that an increased operational efficiency, with mean score of 3.96, also had a high effect. The OHSE compliance, which influenced personnel to ensure the protection of equipment and facilities, had a mean score of 4.12 was also high. From findings, it resulted in improved environmental responsibility with a mean score of 3.88, thus indicating a high effect. There was an improved institutional image, which gave rise to a mean score of 3.91, suggesting the compliance of personnel to OHSE had a high effect. The results show that effective OHSE compliance contributes positively to institutional performance. Respondents indicated that improved safety practices reduce accidents, protect equipment and create a better working environment.

A safe workplace reduces interruptions caused by injuries, equipment damage and environmental incidents. Therefore, OHSE compliance should be considered not only a regulatory requirement but also a strategic factor for institutional efficiency.

Strategies for Improving OHSE Management (Objective 4)

Table 5 presents the recommended improvement strategies that were ranked in order importance. Respondents identified the following measures as important for improving OHSE implementation: continuous safety training programmes, adequate provision of safety facilities (PPE), enhanced inspection protocols, emergency response improvement, improved waste control systems, and stronger enforcement of safety policies.

Table 5: Recommended Improvement Strategies

Improvement Strategy	Importance Ranking
Continuous safety training programmes	1
Adequate provision of safety facilities (PPE)	2
Enhanced inspection protocols	3
Emergency response improvement	4
Improved waste control systems	5
Stronger institutional OHSE policies	6

The findings demonstrate that continuous capacity building and effective monitoring are essential for improving OHSE compliance.

Discussion of Findings

The study revealed that Federal Polytechnic Bauchi has established elements of OHSE management; however, the level of implementation varies among operational areas. The moderate compliance level observed suggests that institutional safety structures exist but require strengthening through improved monitoring, training and resource allocation.

The findings support the argument that safety management systems are effective only when supported by management commitment, employee participation and continuous evaluation. In technical institutions, safety culture development is particularly important because students and staff interact directly with hazardous equipment and materials.

The positive relationship between OHSE compliance and institutional performance indicates that investment in safety measures provides benefits beyond accident prevention. Improved OHSE practices enhance productivity, protect institutional assets and support sustainable campus development.

Summary of Findings

This study assessed occupational health, safety and environmental (OHSE) compliance and its impacts at Federal Polytechnic Bauchi, Nigeria. The major findings based on the study objectives are summarized as follows:

1. **Level of OHSE Compliance:** The study revealed that Federal Polytechnic Bauchi has existing OHSE practices, including safety policies, hazard identification procedures, use of personal protective equipment (PPE) and environmental management activities. However, the overall compliance level was found to be moderate, indicating that while safety structures exist, implementation and monitoring require further improvement.
2. **Occupational Hazards and Environmental Risks:** The study identified mechanical hazards, electrical hazards, fire risks, chemical exposure, ergonomic problems and improper waste management as major occupational and environmental risks within workshops, laboratories and operational areas. Mechanical and electrical hazards were identified as the most significant due to the practical nature of engineering activities.
3. **Impacts of OHSE Compliance:** The findings demonstrated that effective OHSE compliance contributes positively to institutional performance through reduction of accidents, improved productivity, protection of equipment, enhanced staff confidence and improved environmental sustainability.
4. **Strategies for Improving OHSE Management:** The study established that continuous safety training, enhanced inspection protocols, adequate provision of safety facilities (PPE), improved

waste control systems and stronger institutional OHSE policies to increase workplace safety and environmental performance.

Conclusion

Occupational health, safety and environmental compliance is essential for sustainable operation of technical institutions where practical activities involving machinery, electrical systems, chemicals and other hazards are regularly conducted.

I. This study concludes that Federal Polytechnic Bauchi has developed awareness and basic structures for OHSE management; however, the level of implementation requires continuous improvement.
II. The effectiveness of OHSE practices depends largely on management commitment, availability of safety resources, employee participation and consistent monitoring.
III. Improved OHSE compliance will reduce workplace accidents, protect institutional resources, enhance environmental responsibility and create a safer teaching, learning and working environment.
IV. Therefore, OHSE management should be regarded as an integral component of institutional development rather than only a regulatory obligation.

Recommendations

Based on the findings, the following recommendations are proposed:

I. **Strengthening Safety Training Programmes:** Regular occupational safety training should be organized for academic staff, technologists, technicians and students involved in practical activities.
II. **Improvement of Personal Protective Equipment (PPE) Availability:** Management should ensure adequate provision, maintenance and enforcement of PPE usage in all workshops and laboratories.
III. **Establishment of Routine Safety Audits:** Periodic OHSE inspections and compliance audits should be conducted to identify hazards and evaluate corrective actions.
IV. **Improvement of Emergency Preparedness:** Fire protection facilities, first-aid systems, emergency exits and evacuation procedures should be regularly reviewed and improved.
V. **Enhanced Environmental Management Practices:** The institution should strengthen waste segregation, recycling, chemical disposal and pollution prevention programmes.

Development of an Integrated OHSE Management System

Federal Polytechnic Bauchi should adopt an integrated framework aligned with international standards such as ISO 45001 and ISO 14001 to promote continual improvement.

Contribution to Knowledge

This study contributes to knowledge in the following ways:

I. It provides empirical evidence on OHSE compliance within a Nigerian technical institution, an area with limited documented research.
II. It integrates occupational safety and environmental compliance assessment into a single institutional framework.
III. It demonstrates the relationship between OHSE compliance and institutional outcomes including safety performance, productivity and sustainability.

IV. It provides a practical OHSE improvement model that can guide similar polytechnics and technical institutions in developing countries.

I. It establishes a foundation for future studies involving quantitative OHSE performance indicators, safety culture assessment and comparative analysis among Nigerian tertiary institutions.

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