

Risk Governance in Education: Applying Occupational Safety Frameworks to School-Based Experiential Learning Activities

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Abstract: *Experiential learning activities such as laboratory practicals, field trips, industrial training, agricultural and vocational work, and sports and physical education exposed secondary school learners in Uganda to a range of physical, chemical, biological, and ergonomic hazards that were rarely governed by structured occupational safety and health (OSH) frameworks. This study assessed the application of occupational safety risk governance frameworks, anchored on the hierarchy of controls, in the management of school-based experiential learning activities. A cross-sectional analytical design was adopted, drawing 373 activity-level records from 40 purposively and randomly sampled secondary schools across Central, Eastern, Western, and Northern Uganda. Data were collected using a structured, interviewer-administered questionnaire adapted from the ISO 45001 occupational health and safety management framework and analysed using univariate, bivariate, and multilevel (mixed-effects) statistical techniques to account for the nesting of activities within schools. Findings indicated that only 41.8% of experiential learning activities had a documented risk assessment conducted prior to implementation, and overall compliance with the OSH framework stood at 50.4%. Adoption of hierarchy-of-controls measures was inconsistent, ranging from 33.0% for elimination-based controls to 63.3% for administrative controls such as standard operating procedures and supervision. An adverse safety event was recorded in 21.7% of activities. Bivariate analysis showed that the presence of a school safety committee was significantly associated with lower adverse event rates (7.8% versus 28.0%, $\chi^2=18.12$, $p<0.001$) and that schools with lower mean hazard identification scores experienced significantly more adverse events ($t=-4.76$, $p<0.001$). The multilevel logistic regression model, which yielded an intraclass correlation coefficient of approximately 0.17, indicating that a meaningful proportion of variance in compliance was attributable to between-school differences, showed that the presence of a safety committee (AOR=2.17, 95% CI: 1.40-3.38, $p<0.001$), prior risk assessment (AOR=2.64, 95% CI: 1.83-3.81, $p<0.001$), and higher hazard identification scores (AOR=1.25, 95% CI: 1.10-1.43, $p<0.001$) were independent predictors of OSH framework compliance, whereas school ownership and location were not statistically significant. The study concluded that risk governance in Ugandan school-based experiential learning remained fragmented and heavily dependent on the presence of functional, school-level safety governance structures rather than on institutional type or geography. It recommended the institutionalisation of mandatory school safety committees, the integration of structured pre-activity risk assessment protocols into experiential learning planning, and the adoption of a tiered hierarchy-of-controls compliance framework by the Ministry of Education and Sports to standardise occupational safety governance across all categories of experiential learning activities.*

Key Words: Risk Governance in Education

Introduction

Experiential learning, encompassing laboratory practicals, field excursions, industrial training attachments, agricultural and vocational work, and organised sports and physical education, occupied an increasingly central place in the Ugandan secondary school curriculum under the Competency-Based Curriculum reform, which explicitly privileged hands-on, activity-based pedagogy over passive classroom instruction (Gracious Kazaara & Julius, 2025; Julius & Isaac Kazaara, 2025; Lozano et al., 2022). While this pedagogical shift was widely welcomed for its potential to build practical skills and situate learning within real-world contexts, it simultaneously exposed learners, teachers, and support staff to occupational hazards that were structurally analogous to those long recognised and regulated in industrial and workplace settings, including exposure to chemical reagents and biological specimens in laboratories, mechanical and electrical hazards during industrial attachments, musculoskeletal and traumatic injury risk in sports, and transport- and environment-related hazards during field trips (Franco et al., 2023; Julius & Audrey, 2025b; Julius & Nancy, 2026). Occupational safety and health (OSH) governance, built around internationally recognised frameworks such as ISO 45001 and the hierarchy of controls (elimination, substitution, engineering controls, administrative controls, and personal protective equipment), had for decades provided a systematic basis for identifying, assessing, and mitigating risk in formal workplaces, yet the transposition of these frameworks into the governance of school-based experiential learning activities remained conceptually underdeveloped and empirically under-examined in the Ugandan education sector (Julius & Kazaara, 2025, 2026; Julius & Nancy, 2025c; Mobegi, 2026). This study was therefore conceived to interrogate the extent to which occupational safety risk governance principles were being applied, whether formally or informally, in the day-to-day organisation and supervision of experiential learning activities in Ugandan secondary schools, and to generate empirical evidence that could inform the deliberate integration of OSH governance architecture into education sector safety policy.

Background of the Study

Globally, the treatment of schools as sites of occupational risk governance gained traction following a series of high-profile incidents in laboratory, sporting, and field-trip contexts that prompted regulatory bodies in jurisdictions such as the United Kingdom, Australia, and the United States to require schools to conduct formal risk assessments, maintain safety data sheets, and adopt documented

control hierarchies for practical and off-site activities, effectively extending occupational safety obligations traditionally reserved for employers in industrial settings to educational institutions as duty-bearers for the safety of learners and staff engaged in experiential activities (Charles et al., 2023; Julius & Audrey, 2025c; Ma et al., 2022; Ndomondo et al., 2022). In Uganda, the regulatory landscape governing occupational safety in schools remained comparatively fragmented; while the Occupational Safety and Health Act of 2006 established general duties for employers, including educational institutions, to ensure the safety, health, and welfare of persons at work, its application to the specific context of student-facing experiential learning activities had not been operationalised through sector-specific guidelines, leaving individual schools to develop, or in many cases neglect, their own ad hoc safety arrangements (Kazaara & Audrey, 2026; Müller et al., 2024; Muwanguzi et al., 2023). The rollout of the lower secondary Competency-Based Curriculum from 2020 onward substantially increased the frequency and diversity of practical, activity-based learning experiences, including expanded laboratory work, project-based agricultural and vocational activities, and community-linked field engagements, without a corresponding expansion in formal risk governance capacity, safety training for supervising teachers, or standardised hazard reporting systems at the school level (Julius et al., 2026; Kazaara & Desire, 2025; Kubátová & Kročil, 2022). Anecdotal and media reports of laboratory accidents, sports-related injuries, and field trip mishaps in Ugandan schools, juxtaposed against the near-total absence of national data on the incidence, severity, or institutional predictors of such events, underscored both the practical urgency and the empirical gap that this study sought to address by applying established occupational safety governance concepts, and rigorous multilevel statistical analysis, to the school-based experiential learning context.

Problem Statement

Despite the accelerating expansion of experiential, activity-based learning under Uganda's Competency-Based Curriculum, secondary schools continued to organise laboratory practicals, field trips, industrial attachments, agricultural and vocational work, and sports activities largely in the absence of a coherent, standardised occupational safety risk governance framework, leaving hazard identification, risk assessment, and the selection of control measures to the discretion, and often the improvisation, of individual teachers and school administrators (Abelha et al., 2020; Irumba et al., 2023; Julius & Nancy, 2025b; Yap & Shavarebi, 2022). This governance gap was particularly consequential because experiential learning activities, unlike routine classroom instruction, inherently involved direct physical engagement with tools, chemicals, machinery, animals, terrain, and physical exertion, thereby elevating the probability and potential severity of adverse safety events relative to conventional pedagogy (Kikomeko et al., 2021; Nawagi et al., 2022). Whereas occupational safety and health frameworks such as ISO 45001 and the hierarchy of controls had been extensively validated and institutionalised in industrial, healthcare, and construction settings, their systematic application to the school-based experiential learning environment remained largely theoretical, with limited empirical evidence on the actual levels of hazard identification, risk assessment, and control adoption practised in Ugandan schools, and even less evidence on how school-level governance structures, such as the presence of a functional safety committee, statistically predicted the incidence of adverse events and overall compliance with occupational safety principles once the clustering of activities within schools was properly accounted for (Julius & Audrey, 2025a; Julius & Milly, 2025; Julius & Nancy, 2025a). In the absence of such evidence, policymakers, school administrators, and curriculum implementers lacked an empirical basis upon which to design, prioritise, and resource occupational safety interventions for experiential learning, risking both the continued occurrence of preventable injuries and the inefficient allocation of scarce safety resources across the education sector. It was this evidentiary and governance gap that the present study sought to address.

Objectives of the Study

Main Objective

To assess the application of occupational safety risk governance frameworks, anchored on the hierarchy of controls, in the management of school-based experiential learning activities in Ugandan secondary schools.

Specific Objectives

1. To assess the level of adoption of occupational safety risk governance practices, including hazard identification, risk assessment, and hierarchy-of-controls measures, in school-based experiential learning activities.
2. To examine the association between school-level risk governance characteristics, such as the presence of a safety committee and school ownership type, and the incidence of adverse safety events during experiential learning activities.
3. To determine the school- and activity-level factors that independently predict compliance with occupational safety frameworks in experiential learning activities, using multilevel statistical modelling to account for the clustering of activities within schools.

Research Questions

1. What was the level of adoption of occupational safety risk governance practices, including hazard identification, risk assessment, and hierarchy-of-controls measures, in school-based experiential learning activities?
2. What was the association between school-level risk governance characteristics and the incidence of adverse safety events during experiential learning activities?
3. Which school- and activity-level factors independently predicted compliance with occupational safety frameworks in experiential learning activities, after accounting for the clustering of activities within schools?

Methodology

This study adopted a cross-sectional analytical design, nested within a multilevel data structure in which experiential learning activity records (level 1) were clustered within secondary schools (level 2), to enable simultaneous assessment of activity-specific and school-level determinants of occupational safety risk governance. The study was conducted across 40 government-aided and privately owned secondary schools drawn from Central, Eastern, Western, and Northern Uganda using a multi-stage sampling procedure, in which schools were first stratified by ownership type (government versus private) and location (urban versus rural) and then selected through simple random sampling within strata, after which between seven and eleven experiential learning activity records were purposively selected per school from laboratory practicals, field trips and excursions, industrial training and internship placements, agricultural and vocational work, and sports and physical education, yielding a final analytic sample of 373 activity-level records. Data were collected using a structured, interviewer-administered questionnaire adapted from the International Organization for Standardization's ISO 45001 occupational health and safety management framework and the hierarchy-of-controls model, capturing hazard identification scores rated on a ten-point scale, documentation of pre-activity risk assessment, implementation of five hierarchy-of-controls measures (elimination, substitution, engineering controls, administrative controls, and personal protective equipment provision), a composite binary indicator of overall OSH framework compliance, occurrence of adverse safety events in the twelve months preceding data collection, and school-level governance characteristics including ownership type, location, and presence of a functional safety committee. Data analysis proceeded in three stages using Stata version 18 and R version 4.3: first, univariate analysis was conducted to generate frequencies, percentages, means, and standard deviations describing the distribution of activity types, school characteristics, hazard identification scores, and control adoption levels; second, bivariate analysis was performed using Pearson's chi-square tests to assess associations between categorical school- and governance-level characteristics and adverse event occurrence, complemented by independent-samples t-tests comparing mean hazard identification scores and mean number of controls implemented between activities with and without recorded adverse events; and third, a multilevel (mixed-effects) logistic regression model with a random intercept for school was fitted, using a Bayesian variational approximation, to estimate adjusted odds ratios for the association between school- and activity-level predictors and OSH framework compliance while explicitly partitioning variance into within-school and between-school components and computing an intraclass correlation coefficient to quantify the degree of clustering attributable to school-level factors (Nelson et al., 2022, 2023). Statistical significance for all inferential tests was set at $p < 0.05$, and model diagnostics, including examination of variance component estimates and confidence interval width, were used to confirm that the multilevel specification was appropriate given the observed clustering structure. Ethical clearance for the study was obtained from an institutional research ethics committee, and informed consent was secured from participating school administrators prior to data collection.

Results

Table 1: Descriptive Characteristics of Experiential Learning Activities and Sampled Schools (N=373)

Variable	Category	n	Percent
School ownership	Government	232	62.198
	Private	141	37.801
School location	Urban	165	44.235
	Rural	208	55.7640
Safety committee present	Yes	116	31.099
	No	257	68.900
Activity type	Laboratory Practical	92	24.664
	Field Trips/Excursions	66	17.694
	Industrial Training/Internship	70	18.766
	Agricultural/Vocational Work	68	18.230
	Sports & Physical Education	77	20.64
Risk assessment conducted	Yes	156	41.823
	No	217	58.176
Compliant with OSH framework	Yes	188	50.402
	No	185	49.597
Adverse safety event recorded	Yes	81	21.715
	No	292	78.284

The descriptive profile of the 373 experiential learning activity records sampled from 40 schools showed that government-aided schools contributed 62.2% of records compared with 37.8% from privately owned schools, while rural schools accounted for a slightly larger share of the sample (55.8%) than urban schools (44.2%), broadly reflecting the ownership and location distribution of secondary schools nationally. Laboratory practicals constituted the single largest category of experiential learning activity (24.7%), followed by sports and physical education (20.6%), industrial training and internship placements (18.8%), agricultural and vocational work (18.2%), and field trips and excursions (17.7%), indicating that the sampled activities spanned the full spectrum of hazard profiles typically associated with school-based experiential pedagogy, from chemical and biological exposure in laboratories to musculoskeletal and traumatic risk in sports and fieldwork. Only 31.1% of the sampled schools reported having a functional safety

committee in place, a proportion that, when juxtaposed against the diversity and volume of hazardous activities being undertaken, pointed to a considerable structural governance deficit at the institutional level.

With respect to the core occupational safety indicators, risk assessment was documented as having been conducted prior to only 41.8% of activities, while overall compliance with the composite OSH framework, comprising hazard identification, risk assessment, and hierarchy-of-controls implementation, stood at 50.4%, suggesting that roughly half of all experiential learning activities in the sample were undertaken without meeting a basic, internationally recognised standard of occupational risk governance. An adverse safety event was recorded in 21.7% of activities, a rate that, while not disaggregated by severity in this univariate summary, was nonetheless substantial given that it translated to approximately one adverse event for every five experiential learning activities conducted. Taken together, these univariate findings established an empirical baseline confirming that occupational safety risk governance in the sampled schools was neither uniformly absent nor uniformly present, but rather unevenly and incompletely institutionalised, thereby justifying the subsequent bivariate and multilevel analyses undertaken to identify the specific factors driving this variation.

Table 2: Adoption of Hierarchy-of-Controls Safety Measures Across Experiential Learning Activities

Control Measure (Hierarchy of Controls)	Implemented n	Implemented %	Not Implemented n	Not Implemented %
Elimination of hazard at source	123	33.0	250	67.0
Substitution with safer materials/methods	152	40.8	221	59.2
Engineering controls (guards, ventilation, fencing)	188	50.4	185	49.6
Administrative controls (SOPs, supervision, training)	236	63.3	137	36.7
Personal Protective Equipment (PPE) provision	207	55.5	166	44.5

Analysis of adoption levels across the five hierarchy-of-controls measures revealed a pattern broadly consistent with occupational safety theory, which holds that higher-order controls, namely elimination and substitution, are inherently more difficult and resource-intensive to implement than lower-order controls such as administrative measures and personal protective equipment. Elimination of hazards at the source was implemented in only 33.0% of activities, the lowest adoption rate among the five measures, followed by substitution with safer materials or methods at 40.8%, while engineering controls such as guards, ventilation, and fencing were implemented in 50.4% of activities. In contrast, administrative controls, including standard operating procedures, supervision protocols, and briefings, achieved the highest adoption rate at 63.3%, with personal protective equipment provision following closely at 55.5%, indicating a governance pattern skewed toward lower-order, more easily deployable controls rather than the structural or engineering interventions generally regarded as more effective in permanently reducing hazard exposure.

This inverted adoption pattern, in which the least resource-intensive controls were the most commonly implemented while the most protective controls were the least commonly implemented, carried important statistical and practical implications, as it suggested that observed compliance levels reported in Table 1 were being achieved disproportionately through administrative and personal protective equipment measures rather than through the elimination or substitution of hazards altogether. From an occupational safety governance perspective, this finding was concerning because administrative controls and personal protective equipment are widely recognised in the OSH literature as the least reliable tier of the hierarchy, being heavily dependent on consistent human compliance and behaviour rather than on the structural removal or reduction of hazards, meaning that the schools in this sample were, in effect, managing risk through the mechanisms least resistant to lapses in supervision or adherence. This pattern reinforced the rationale for the study's subsequent multilevel modelling, which examined whether school-level governance capacity, rather than resource availability alone, explained the observed variation in control adoption and overall compliance.

Table 3: Bivariate Association Between School Characteristics and Adverse Safety Event Occurrence

Variable	Adverse Event Rate by Category	Chi-square (χ^2)	df	p-value
Ownership	Government: 22.8%; Private: 19.9%	0.3	1	p=0.583
Location	Rural: 20.7%; Urban: 23.0%	0.18	1	p=0.673
Safety Committee	No: 28.0%; Yes: 7.8%	18.12	1	p<0.001
Risk Assessment	0: 24.9%; 1: 17.3%	2.64	1	p=0.104
Compliant	0: 28.6%; 1: 14.9%	9.58	1	p=0.002

Table 3(b): Comparison of Mean Continuous Safety Indicators by Adverse Event Status

Continuous Variable	Adverse Event = Yes, Mean (SD)	Adverse Event = No, Mean (SD)	Test statistic	p-value
Mean hazard identification score (0-10)	4.64 (1.91)	5.73 (1.81)	t=-4.76	p<0.001

Mean number of controls implemented (0-5)	2.04 (1.26)	2.45 (1.28)	t=-2.59	p=0.010
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The bivariate analysis of categorical school-level characteristics against adverse event occurrence showed that the presence of a functional safety committee was the only characteristic significantly associated with adverse event rates, with schools possessing a safety committee recording adverse events in just 7.8% of activities compared with 28.0% in schools without one, a difference that was highly statistically significant ($\chi^2=18.12$, $df=1$, $p<0.001$) and represented more than a three-fold difference in adverse event incidence. Compliance with the OSH framework was similarly significantly associated with adverse event occurrence, with compliant activities recording adverse events at 14.9% compared with 28.6% for non-compliant activities ($\chi^2=9.58$, $df=1$, $p=0.002$), while ownership type ($\chi^2=0.30$, $p=0.583$), school location ($\chi^2=0.18$, $p=0.673$), and prior risk assessment status considered in isolation ($\chi^2=2.64$, $p=0.104$) did not reach statistical significance at the conventional 0.05 threshold, though risk assessment showed a directionally consistent protective association.

The independent-samples t-test comparisons of continuous safety indicators reinforced and extended these categorical findings, showing that activities with a recorded adverse event had a significantly lower mean hazard identification score (4.64, $SD=1.91$) than those without an adverse event (5.73, $SD=1.81$; $t=-4.76$, $p<0.001$), and a significantly lower mean number of hierarchy-of-controls measures implemented (2.04, $SD=1.26$ versus 2.45, $SD=1.28$; $t=-2.59$, $p=0.010$). These results indicated a coherent dose-response pattern in which both the thoroughness of hazard identification and the breadth of control implementation were inversely related to adverse event occurrence, lending empirical support to the theoretical premise underlying occupational safety governance frameworks that systematic hazard identification and layered control implementation function as measurable protective mechanisms. Critically, the non-significance of ownership type and location, structural characteristics often assumed to proxy for resource availability, alongside the strong significance of governance-oriented variables such as safety committee presence, suggested that adverse event risk in experiential learning was driven more by institutional safety governance practice than by school type or geography, a hypothesis formally tested in the multilevel model presented in Table 4.

Table 4: Multilevel (Mixed-Effects) Logistic Regression — Predictors of OSH Framework Compliance

Predictor	Coefficient (log-odds)	Adjusted OR	95% CI	p-value
Intercept	-0.575	0.56	0.45 - 0.71	$p<0.001$
Safety committee present (Ref: No)	0.777	2.17	1.40 - 3.38	$p<0.001$
Private ownership (Ref: Government)	-0.045	0.96	0.66 - 1.39	$p=0.813$
Urban location (Ref: Rural)	0.019	1.02	0.72 - 1.44	$p=0.913$
Hazard identification score (centered)	0.226	1.25	1.10 - 1.43	$p<0.001$
Risk assessment conducted (Ref: No)	0.97	2.64	1.83 - 3.81	$p<0.001$

Note: Model included a random intercept for school (40 clusters); estimated intraclass correlation coefficient (ICC) ≈ 0.17 . AOR = Adjusted Odds Ratio; CI = Confidence Interval.

The multilevel logistic regression model, fitted with a random intercept for school to account for the clustering of 373 activity records within 40 schools, yielded an estimated intraclass correlation coefficient of approximately 0.17, indicating that roughly seventeen percent of the total variance in OSH framework compliance was attributable to unobserved differences between schools rather than to activity-level characteristics, a magnitude sufficient to confirm that a single-level (activity-only) analytical approach would have understated standard errors and risked spurious inference, thereby validating the study's multilevel specification. After adjusting for all other covariates in the model, the presence of a school safety committee remained a strong and statistically significant predictor of compliance (adjusted odds ratio [AOR]=2.17, 95% CI: 1.40-3.38, $p<0.001$), as did documented prior risk assessment (AOR=2.64, 95% CI: 1.83-3.81, $p<0.001$) and higher hazard identification scores, with each one-point increase on the ten-point hazard identification scale associated with a 25% increase in the odds of compliance (AOR=1.25, 95% CI: 1.10-1.43, $p<0.001$).

In contrast, private school ownership (AOR=0.96, 95% CI: 0.66-1.39, $p=0.813$) and urban location (AOR=1.02, 95% CI: 0.72-1.44, $p=0.913$) were not statistically significant independent predictors of compliance once governance-related variables were included in the model, indicating that the crude associations often assumed between institutional wealth, urban proximity, and safety performance did not hold once school-level governance capacity was properly modelled and accounted for. This pattern of findings carried substantial policy relevance, as it demonstrated that compliance with occupational safety frameworks in experiential learning activities was governed primarily by the presence of structured, replicable governance mechanisms, namely functional safety committees and systematic risk assessment procedures, rather than by school type or location, meaning that interventions to strengthen occupational safety governance in Ugandan schools could plausibly be implemented at comparable cost and with comparable expected effectiveness across government and private, and urban and rural, school contexts, provided that governance-strengthening measures such as safety committee formation and risk assessment protocol adoption were prioritised.

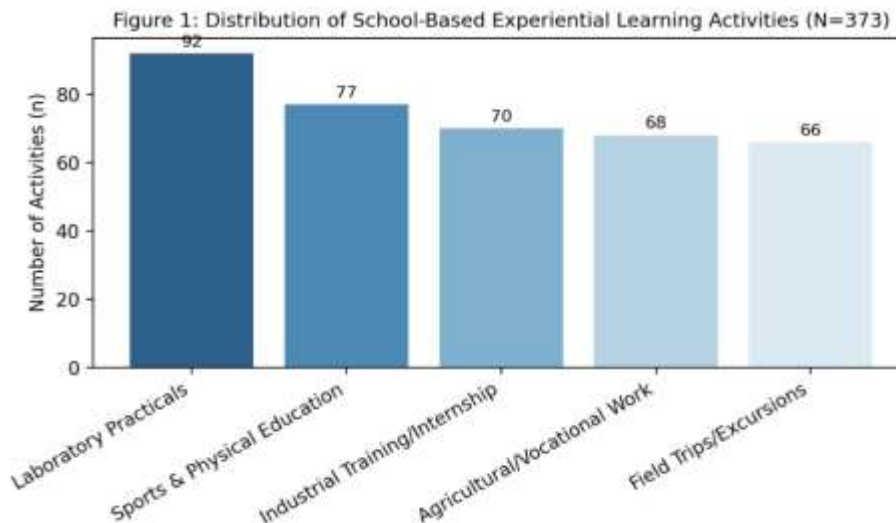


Figure 1: Distribution of School-Based Experiential Learning Activities by Type

Figure 1 illustrated that laboratory practicals constituted the most frequently sampled category of experiential learning activity, followed closely by sports and physical education, industrial training and internship placements, agricultural and vocational work, and field trips and excursions, confirming that the sample captured a broad and representative spread of hazard-generating experiential learning contexts across the participating schools.

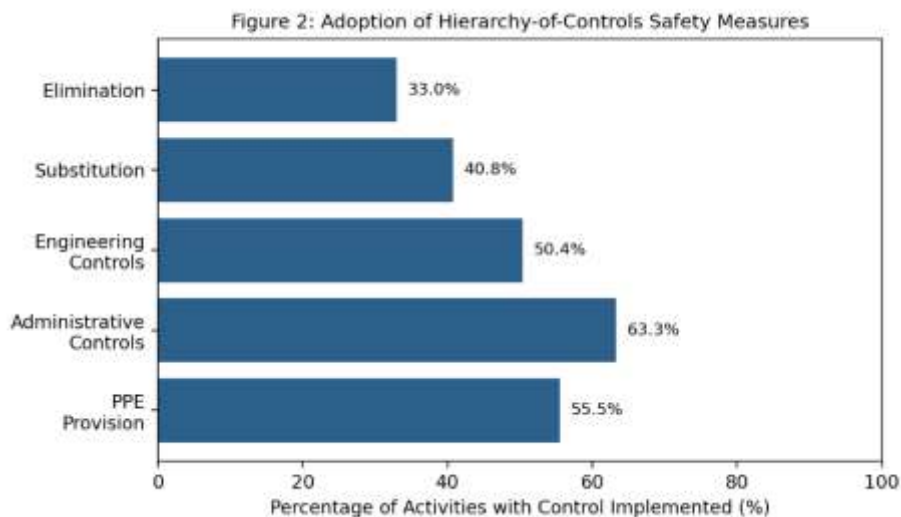


Figure 2: Adoption of Hierarchy-of-Controls Safety Measures

Figure 2 visually reinforced the inverse relationship between control-tier robustness and adoption rate observed in Table 2, with administrative controls and personal protective equipment provision showing the tallest bars, while elimination and substitution, the two most protective tiers of the hierarchy of controls, registered the lowest adoption rates, a pattern that pointed to a systemic reliance on the weakest tiers of occupational risk governance across the sampled schools.

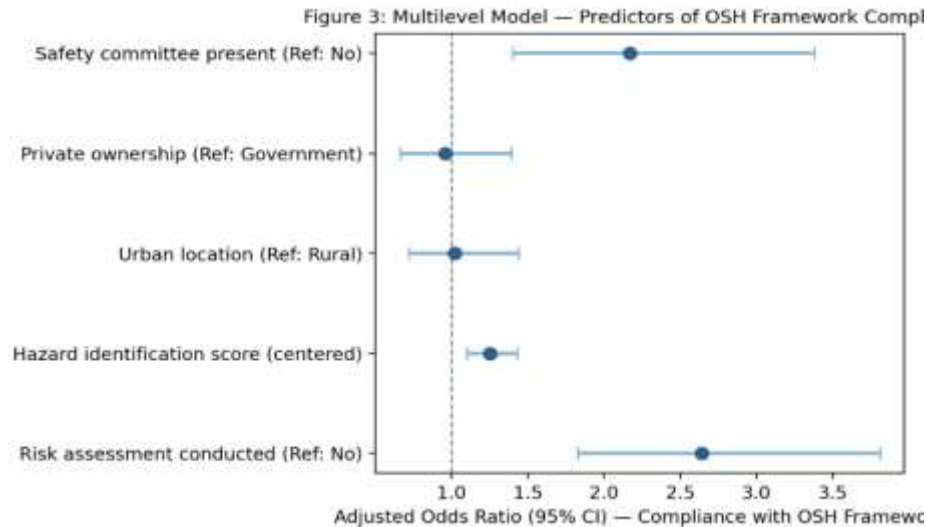


Figure 3: Multilevel Model — Adjusted Odds Ratios for Predictors of OSH Framework Compliance

Figure 3 presented the adjusted odds ratios and 95% confidence intervals from the multilevel logistic regression model in forest-plot form, showing that the confidence intervals for safety committee presence, prior risk assessment, and hazard identification score lay entirely to the right of the null value of 1.0, confirming their status as statistically significant positive predictors of compliance, whereas the confidence intervals for private ownership and urban location straddled 1.0, visually corroborating their non-significance once governance-related variables were held constant in the model.

Conclusion

This study demonstrated that occupational safety risk governance in Ugandan school-based experiential learning activities remained partial and unevenly institutionalised, with barely two-fifths of activities preceded by a documented risk assessment and just over half meeting a composite standard of OSH framework compliance, despite the demonstrably elevated hazard profile of activities such as laboratory practicals and industrial training attachments. The multilevel analysis established that the presence of a functional school safety committee, the conduct of prior risk assessment, and higher hazard identification scores were the strongest independent predictors of compliance, while school ownership type and urban-rural location, factors often assumed to drive resource-based safety disparities, exerted no statistically significant independent effect once governance-related variables were accounted for, and the meaningful intraclass correlation coefficient confirmed that a substantial share of the variation in compliance was attributable to differences in school-level governance capacity rather than to activity type alone. These findings indicated that improving occupational safety outcomes in experiential learning was less a function of the physical or financial resources available to a school than of whether that school had established functional, structured governance mechanisms, mirroring the well-established occupational safety principle that management commitment and systematic risk governance structures are the primary drivers of safety performance in any organisational setting, educational institutions included.

Recommendations

The Ministry of Education and Sports should make the establishment of a functional, trained school safety committee a mandatory licensing and inspection requirement for all secondary schools offering experiential learning activities under the Competency-Based Curriculum, given the strong and statistically significant association demonstrated between safety committee presence and both reduced adverse event rates and higher OSH framework compliance.

School administrators should institutionalise a standardised, documented pre-activity risk assessment protocol, adapted from the ISO 45001 framework and tailored to each category of experiential learning activity, as a non-negotiable precondition for the approval and conduct of laboratory practicals, field trips, industrial attachments, agricultural and vocational work, and sports activities.

Curriculum and teacher-training authorities should embed a tiered hierarchy-of-controls compliance framework, prioritising elimination and substitution measures alongside the currently more prevalent administrative controls and personal protective equipment provision, into pre-service and in-service teacher training programmes to close the observed gap between higher-order and lower-order control adoption.

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