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Academic integrity under scrutiny: a cross-country investigation into examination malpractice and plagiaristic behavior among pre-tertiary students in Ghana and Botswana

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Abstract

Academic integrity has emerged as a critical concern within global education systems, particularly with the rise of digital technologies that provide students with unprecedented access to information, facilitating academic misconduct. While many Western educational contexts emphasize individual responsibility for academic honesty, educational systems in Sub-Saharan Africa, such as Ghana and Botswana, face unique challenges shaped by cultural values, resource constraints, and institutional practices. This comparative study explored the perspectives and behaviors of pre-tertiary students in Ghana and Botswana regarding academic dishonesty, including cheating and plagiarism, within the context of their respective educational environments. A descriptive-correlational survey design was employed, with data collected from 600 pre-tertiary students (300 from each country) through a structured questionnaire. The study investigated the relationship between pre-tertiary students' self-reported engagement in academic dishonesty, their awareness of academic integrity policies, and the level of teacher supervision during assessments. Findings suggest that while both countries exhibit concerns related to academic dishonesty, cultural and institutional factors significantly influence pre-tertiary students' perceptions and behaviors. This study highlights the need for contextually tailored academic integrity frameworks in Sub-Saharan Africa, which consider both the socio-cultural values and institutional capacities of countries like Ghana and Botswana. It also emphasized the importance of raising awareness about academic integrity policies and improving teacher supervision to foster a culture of honesty and fairness in assessments. The study recommended stronger enforcement of integrity policies, increased supervision during assessments, and embedding ethics education in curricula to foster a culture of academic honesty.

Keywords Academic integrity, Academic dishonesty, Integrity policies, Teacher supervision, Ethics awareness, Ghana, Botswana

Clinical trial number
Not applicable.

Introduction

In the era of globalization, the concept of academic integrity has become increasingly significant across diverse educational systems worldwide (Vlahos 2023). As higher education institutions strive to align with global standards and participate in international knowledge exchange, maintaining ethical practices in teaching, learning, and assessment has become essential (Mbiandja 2021; Iqbal et al. 2021). Academic integrity is a cornerstone of quality education and plays a crucial role in fostering trust, fairness, accountability, and the accurate assessment of student competence (Bretag 2016; Kocdar et al. 2018). It ensures that learners engage honestly in educational processes and that their academic achievements reflect genuine effort and understanding. With the rapid advancement of digital technologies, educational systems globally are facing increasing challenges in preserving ethical standards in academic assessments. Pre-tertiary students now have unprecedented access to information and technological tools, which, while beneficial to learning, also offer new avenues for academic misconduct. Online platforms, artificial intelligence (AI) tools, and collaborative networks can sometimes encourage behaviors such as copy-paste plagiarism, collusion, and impersonation during assessments (Toppin and Spohn 2013). While many educational institutions have responded with measures such as honor codes, academic integrity training, and plagiarism detection software (e.g., Turnitin), research continues to show high levels of academic dishonesty across various educational levels and contexts (McCabe and Trevino 2002; Sutherland-Smith 2008; Ntumi et al. 2022).

However, what constitutes academic dishonesty, and how it is interpreted and addressed, varies significantly across cultural and national contexts. In Western educational systems, academic integrity is often framed through an individualistic lens that emphasizes personal responsibility, originality, and intellectual ownership (Mokua 2014; Iqbal et al. 2021). In contrast, in many African societies, including those in Sub-Saharan Africa, collectivist cultural norms, resource constraints, and differing pedagogical traditions shape how academic integrity is both perceived and practiced. This study brings focus to two countries in Sub-Saharan Africa Ghana and Botswana to explore these contextual nuances. Both countries are recognized for their investment in education and their efforts to align with global standards of academic excellence. Yet, they represent distinct socio-cultural and educational landscapes that influence how pre-tertiary students, teachers, and institutions approach issues related to assessment integrity (Ntumi et al. 2022).

In Ghana, education is deeply regarded as a powerful lever for socio-economic advancement, often serving as a pathway to upward mobility and improved life prospects. Academic achievement is not only a personal aspiration but also a source of familial pride and community validation. However, this intense emphasis on academic success especially within contexts marked by systemic constraints such as overcrowded classrooms, insufficient teaching materials, and high-stakes national examinations can inadvertently foster environments where academic dishonesty is normalized or seen as a pragmatic response to pressure (Tuwor 2013; Vlahos 2023). Reported instances of cheating during standardized tests, unauthorized group work, and plagiarized assignments

are widespread, and enforcement of academic integrity standards often varies depending on institutional culture, teacher attitudes, and infrastructural limitations (Owusu-Banahene & Amofa, 2011; Iqbal et al. 2021).

In contrast, Botswana offers a somewhat different educational and cultural landscape. The country has made significant strides in educational reform, particularly in expanding access and improving quality across its school system. Academic integrity policies are well-articulated, especially at the tertiary level, where institutions typically implement clear guidelines and disciplinary procedures. However, challenges remain in translating these standards to the pre-tertiary context, where enforcement and awareness are less uniform. While Botswana may not experience the same level of systemic pressures as Ghana such as large class sizes or extreme resource constraints the subtler dynamics of teacher supervision, policy implementation fidelity, and student engagement still shape the ethical climate in schools. Moreover, in Botswana, cultural expectations around conformity, respect for institutional authority, and the value placed on national progress can sometimes act as deterrents to academic dishonesty, though they are not universally effective. The comparative analysis of both countries thus highlights how differing social norms, policy infrastructures, and educational pressures contribute to varying expressions and tolerances of academic dishonesty at the pre-tertiary level.

According to Motshegwa (2014), although there is an increased focus on promoting academic honesty, challenges such as lack of awareness, inadequate training of educators, and insufficient monitoring tools hinder the effective implementation of integrity policies. Furthermore, a cultural emphasis on communal success and helping peers can sometimes blur the line between collaboration and cheating. Both Ghana and Botswana exemplify the tension between global academic standards and local cultural realities. Pre-tertiary students in these countries often operate in educational environments shaped by high expectations, infrastructural constraints, and evolving assessment practices. Yet, limited research exists that explores how these cultural and institutional factors intersect to influence academic integrity at the classroom level. As educational systems in Africa increasingly integrate international norms and technologies, there is a growing need to understand how local beliefs, values, and practices mediate the implementation of academic integrity frameworks.

While global trends in academic integrity are well documented, there remains a significant gap in understanding how cultural factors shape the perception and practice of academic integrity in different regions. In Africa, educational integrity issues like cheating and plagiarism are often compounded by local cultural, economic, and institutional factors that influence both pre-tertiary students' attitudes and teachers' responses (Okeke 2019). However, there is a lack of cross-cultural research that explores how these integrity challenges manifest and are addressed in different African countries. Specifically, the educational systems of Ghana and Botswana, both with distinct cultural, historical, and social contexts, have yet to be thoroughly compared in terms of their approaches to academic dishonesty and assessment integrity. In Ghana, for example, academic dishonesty is often seen as a reflection of broader socio-cultural values, including communalism and the importance of maintaining social status through academic success (Tuwor 2013; Adebola et al. 2019). Conversely, Botswana's educational system, with its emphasis on academic rigor and national identity, faces different pressures related to academic integrity, such as the impact of limited resources and institutional support in

combating cheating (Motshegwa 2014). These contrasting contexts present an opportunity for a comparative analysis of how different educational systems in Sub-Saharan Africa approach the issues of academic dishonesty, plagiarism, and the maintenance of assessment integrity.

Existing literature on academic integrity predominantly focuses on higher education contexts, with much of the research concentrating on universities, particularly in countries like Australia (Bretag 2016). These studies often examine the prevalence of academic dishonesty, such as plagiarism, cheating, and unethical practices, within university environments. The majority of these investigations explore how institutional policies, student attitudes, and socio-cultural factors contribute to the incidence of academic dishonesty at the tertiary level. However, very few studies have examined academic integrity in African settings, where socio-economic challenges, cultural expectations, and educational systems differ significantly from those in the West. Moreover, there is little cross-cultural research comparing how countries within Africa, such as Ghana and Botswana, address academic integrity issues within their educational frameworks. Research has shown that cultural factors, including collectivism versus individualism, play a critical role in how cheating and plagiarism are viewed in different contexts (Mokua 2014). While individualistic cultures may emphasize personal responsibility and the sanctity of intellectual property, collectivist cultures may view academic dishonesty differently, as part of a larger community or social structure. The nuances of these cultural differences in Ghana and Botswana remain underexplored, making it difficult for policymakers, educators, and researchers to craft culturally relevant solutions to academic dishonesty. This study examined how cultural, institutional, and supervisory factors influence academic dishonesty among pre-tertiary students in Ghana and Botswana. It explored how cultural values, institutional policies (like honor codes and anti-plagiarism guidelines), and teacher supervision during assessments shape students' engagement in academic dishonesty. By comparing these two countries, the study aims to identify differences and similarities in perceptions and behaviors related to academic integrity, offering context-specific insights for improving academic integrity practices in both nations.

Research questions

1. Is there a significant association between pre-tertiary students' country (Ghana vs. Botswana) and their self-reported engagement in academic dishonesty (e.g., cheating during exams)?
2. Is there a significant relationship between the presence of institutional academic integrity policies (e.g., honor codes, anti-plagiarism guidelines) and pre-tertiary students' awareness of assessment ethics across the two countries?
3. Is there a significant association between the level of teacher supervision during assessments and the frequency of reported cheating behaviors among pre-tertiary students in Ghana and Botswana?

Methodology

Research design

The study adopted a comparative, descriptive-correlational survey design, which was deemed appropriate for investigating the interplay between multiple categorical

variables across distinct socio-cultural and educational contexts. This methodological approach was particularly well-suited to the study's objectives, as it enabled a systematic comparison of pre-tertiary students' academic integrity-related attitudes and behaviors in Ghana and Botswana two Sub-Saharan African countries with different educational systems and cultural landscapes. The comparative component of the design facilitated the exploration of cross-national differences in student perceptions, institutional enforcement of integrity policies, and the prevalence of dishonest academic behaviors such as examination malpractice and plagiarism. This dimension allowed for the identification of contextual patterns and divergences that may be rooted in national education policies, cultural norms, or institutional practices (Setyawati et al. 2020). The descriptive dimension of the design provided a quantitative portrait of the status quo, highlighting how widespread specific behaviors and policy implementations were within each country. Through structured survey items, the study was able to gather comprehensive baseline data on the frequency of cheating, levels of teacher supervision, students' awareness of institutional integrity frameworks, and the extent of formal ethics training (Fraenkel et al. 2019). The correlational aspect of the design further enabled the examination of statistical associations between key variables such as students' demographic characteristics (e.g., age, school type, urban-rural location), institutional factors (e.g., policy awareness, teacher supervision), and reported engagement in academic dishonesty. Importantly, this approach allowed for the application of statistical tools including Chi-square tests of independence and measures of association such as Cramér's V to determine the strength and significance of relationships between variables.

Population and sampling technique

The target population consisted of pre-tertiary students from selected public and private schools in Ghana and Botswana. These pre-tertiary students were deemed suitable because they are typically exposed to high-stakes assessments and are at a developmental stage where moral reasoning and peer influence play pivotal roles in behavior formation (Bandura 1991). Furthermore, these pre-tertiary students are likely to have encountered issues related to cheating, plagiarism, and institutional rules on academic honesty. A multi-stage sampling technique was used to ensure both national representativeness and comparability across contexts. In the first stage, purposive sampling was used to select four regions in Ghana (Greater Accra, Ashanti, Northern, and Central Regions) and three regions in Botswana (Gaborone, Francistown, and Central District), selected to reflect urban, peri-urban, and rural education environments. In the second stage, stratified sampling was applied to identify schools, ensuring proportional representation of public and private institutions. In the final stage, simple random sampling was used to select pre-tertiary students from each school to participate in the study. The total sample size was 600 pre-tertiary students 300 from Ghana and 300 from Botswana. The sample size was determined using Cochran's formula for determining sample size for large populations, adjusted for proportional representation across countries and gender balance.

Instrumentation

To effectively collect data relevant to the objectives of this study, the researcher developed a structured questionnaire grounded in a comprehensive review of the literature

and existing validated tools on academic integrity. The primary sources that informed the development of the instrument included the McCabe Academic Integrity Survey (McCabe et al. 2012) and components from the Academic Integrity Policy Framework (AIPF) developed by Bretag et al. (2014). These frameworks have been widely used in studies examining student behavior related to cheating and plagiarism in diverse educational contexts. However, given the cultural and systemic differences between Ghana and Botswana, the questionnaire was carefully adapted and contextualized to suit the specific socio-educational environments of the two countries. The questionnaire consisted of four main sections designed to elicit information pertinent to the study's variables:

1. Demographic Information: This section captured basic participant characteristics, including age, gender, country of residence, type of school attended (public or private), and the geographical location of the school (urban, peri-urban, or rural). These variables were essential for understanding the demographic distribution of the sample and for exploring potential relationships with academic integrity practices.
2. Awareness of Integrity Policies: Items in this section assessed the extent to which pre-tertiary students were familiar with institutional policies concerning academic dishonesty, including cheating during examinations and plagiarism in assignments. It also explored whether pre-tertiary students had received any formal orientation, training, or sensitization on academic integrity, either through workshops, handbooks, or classroom instruction. To ensure clarity and consistency, participants were provided with explicit definitions of key terms such as "academic integrity," "academic dishonesty," "cheating," and "plagiarism" prior to completing the survey. This was done through a brief orientation session that allowed students to understand the concepts and their relevance to the questions in the survey. The definitions used in the survey were adapted to ensure cultural appropriateness and were aligned with the definitions commonly used in educational settings within Ghana and Botswana.
3. Perceptions of Academic Dishonesty: Using a five-point Likert scale ranging from "Strongly Disagree" to "Strongly Agree," this section gauged pre-tertiary students' moral evaluations and judgments of dishonest academic behaviors. Items addressed common practices such as copying from peers, submitting work done by others, and using unauthorized resources. The goal was to understand the normative beliefs and values pre-tertiary students hold regarding these behaviors and how they assess the ethical implications of such actions.
4. Reported Academic Behaviors: This section employed both dichotomous (Yes/No) and frequency-based questions to measure self-reported engagement in various forms of academic dishonesty. Pre-tertiary students were asked to indicate whether they had ever engaged in specific behaviors such as copying answers during tests, submitting plagiarized assignments, or using external assistance without permission. The goal was to explore the actual prevalence of these behaviors in both countries.

To enhance the reliability and validity of the instrument, a pilot test was conducted using a sample of 60 pre-tertiary students (30 from Ghana and 30 from Botswana) who were not part of the final study sample. Feedback from the pilot helped identify ambiguous or culturally inappropriate items, which were subsequently revised or eliminated. The internal consistency of the questionnaire's scales was assessed using Cronbach's alpha,

which yielded values ranging from 0.72 to 0.81, indicating an acceptable level of reliability for social science research (Creswell and Creswell 2018).

Data collection procedure

Prior to data collection, ethical approval was obtained from the Institutional Review Boards (IRBs) of the University of Education, Winneba in Ghana and the Botswana University of Agriculture and Natural Resources. Upon receiving approval, official letters of introduction were sent to the regional education directorates, followed by permissions from headteachers of the selected schools. The data collection spanned a six-week period, during which trained research assistants administered the questionnaires in designated classroom settings. These sessions were deliberately scheduled during non-instructional periods to minimize disruption to academic activities and to create a conducive environment for participation. At the beginning of each session, research assistants provided participants with a brief orientation on the purpose and scope of the study. They emphasized the voluntary nature of participation, assured pre-tertiary students of anonymity and confidentiality, and clarified that the information gathered would be used solely for academic purposes. Pre-tertiary students were informed that there were no right or wrong answers and that their honest responses would significantly contribute to the quality and relevance of the research findings. Participants completed the questionnaires individually within an average timeframe of 25 to 30 min. To maintain data integrity, the completed instruments were collected immediately after completion. This approach minimized the risk of peer influence and reduced the possibility of missing or altered responses. All data collected were stored securely and prepared for analysis using a standardized coding system.

Data analysis

The quantitative data obtained from the completed questionnaires were systematically analyzed using the Statistical Package for the Social Sciences (SPSS), version 26. The data analysis procedure began with data cleaning, which involved checking for errors, missing values, and inconsistencies in responses. Subsequently, variables were coded and categorized to facilitate statistical analysis. Descriptive statistics, including frequencies, percentages, means, and standard deviations, were used to summarize the demographic characteristics of the respondents and to provide a general overview of trends related to academic integrity across the two national contexts. These descriptive results provided foundational insights into the prevalence and patterns of behaviors related to cheating, plagiarism, and integrity awareness. To answer the main research questions, the study employed the Chi-square test of independence, a non-parametric statistical test used to determine whether there is a significant association between two categorical variables. The choice of the Chi-square test was informed by its suitability for analyzing relationships between nominal or ordinal variables, especially in large samples with independent groups (Field 2018). A significance level of $p < 0.05$ was established as the threshold for determining statistical significance. Where significant associations were identified, additional measures such as Cramér's V were used to interpret the strength of the associations. This multi-level approach ensured that the analysis could go beyond surface-level comparisons to offer deeper interpretations of how cultural and institutional factors shape academic integrity.

Ethical considerations

This study adhered to rigorous ethical standards throughout all phases of the research process, guided by global principles for research involving human subjects (Resnik 2018). Several key ethical measures were implemented to ensure the dignity, rights, and well-being of all participants. Firstly, informed consent was obtained from all pre-tertiary students who took part in the study. For participants below the age of 18, parental or guardian consent was also sought and documented. Each participant was informed about the nature of the study, its aims, potential risks and benefits, and their right to voluntarily participate or withdraw at any stage without penalty. In order to protect participant identity and ensure anonymity, each questionnaire was assigned a coded identifier rather than using names or school identifiers. Furthermore, all completed questionnaires and digital data entries were stored in password-protected databases, accessible only to the primary researcher and authorized personnel. The study also emphasized confidentiality, assuring participants that individual responses would not be shared with school authorities or published in any identifiable form. Data were reported only in aggregated formats. Importantly, the research posed minimal risk to participants, as it involved non-invasive survey questions and maintained psychological safety throughout the process. The researcher took care to avoid any form of deception, coercion, or undue influence, and ensured that participants were treated with respect, fairness, and sensitivity to cultural norms.

Results

Table 1 presents the relationship between various factors such as country, policy presence, teacher supervision, formal ethics training, and policy awareness and pre-tertiary students' engagement in academic dishonesty. The Chi-square test revealed a significant difference in the prevalence of cheating between pre-tertiary students in Ghana and Botswana. Pre-tertiary students in Ghana reported higher rates of cheating (58.1%) compared to their Botswana counterparts (45.2%) ($\chi^2 = 7.89$, $p = 0.005$). The effect size (Cramér's $V = 0.14$) indicates a small to moderate association between country and cheating behaviors. This suggests that national context plays a role in pre-tertiary students' attitudes and behaviors toward academic integrity, with Ghanaian pre-tertiary students engaging in more dishonest practices. The presence of academic integrity policies was significantly associated with reported cheating behavior ($\chi^2 = 34.82$, $p < 0.001$).

Table 1 Academic integrity across contextual variables

Variables	Group	Reported Cheating (%)	Did Not Cheat (%)	Total (*n*)	χ^2	df	*p*-value	Cramér's V
Country	Ghana	122 (58.1%)	88 (41.9%)	210				
	Botswana	95 (45.2%)	115 (54.8%)	210	7.89	1	0.005**	0.14
Policy Presence	Present	83 (31.9%)	177 (68.1%)	260				
	Absent	135 (61.4%)	85 (38.6%)	220	34.82	1	< 0.001**	0.29
Teacher Supervision	High	45 (21.6%)	163 (78.4%)	208				
	Low	115 (54.5%)	96 (45.5%)	211	44.91	1	< 0.001**	0.33
Formal Ethics Training	Yes	83 (39.3%)	128 (60.7%)	211				
	No	135 (63.1%)	79 (36.9%)	214	22.14	1	< 0.001**	0.23
Policy Awareness	Aware	92 (42.6%)	124 (57.4%)	216				
	Not Aware	104 (61.9%)	64 (38.1%)	168	12.57	1	< 0.001**	0.20

$p < 0.05$ (denoted as **), CI = 95%, 2-tailed

Pre-tertiary students attending institutions with integrity policies had lower rates of cheating (31.9%) compared to those at institutions without such policies (61.4%). The Cramér's V of 0.29 indicates a moderate association, suggesting that the presence of institutional policies on academic integrity can significantly reduce the likelihood of cheating.

Teacher supervision also had a substantial impact on academic dishonesty. Pre-tertiary students under low supervision were more likely to cheat (54.5%) compared to those under high supervision (21.6%) ($\chi^2 = 44.91$, $p < 0.001$). The odds ratio of 4.36 suggests that pre-tertiary students under low supervision are 4.36 times more likely to engage in cheating behavior than those under high supervision. The Cramér's V (0.33) and Phi (0.33) both indicate a moderate to strong association between supervision levels and cheating behaviors, emphasizing the effectiveness of teacher supervision in mitigating academic dishonesty. The relationship between formal ethics training and cheating was significant ($\chi^2 = 22.14$, $p < 0.001$), with pre-tertiary students who had received ethics training reporting lower instances of cheating (39.3%) compared to those who had not received such training (63.1%). The Cramér's V of 0.23 suggests a moderate association, indicating that formal training in ethics is effective in promoting academic integrity. Awareness of academic integrity policies was significantly associated with reduced cheating behaviors. Pre-tertiary students who were aware of their institution's policies on academic integrity were less likely to engage in cheating (42.6%) compared to those who were unaware (61.9%) ($\chi^2 = 12.57$, $p < 0.001$). The Cramér's V of 0.20 indicates a moderate effect, showing that awareness of policies plays a role in promoting ethical behavior in academic settings.

Table 2 explores the relationship between school type, country, and awareness of policies with pre-tertiary students' perceptions of plagiarism as a serious offense. Pre-tertiary students from public schools were more likely to perceive plagiarism as a serious offense (69.5%) compared to pre-tertiary students in private schools (55.7%) ($\chi^2 = 9.78$, $p = 0.002$). The Cramér's V of 0.15 indicates a small to moderate association, suggesting that school type influences pre-tertiary students' views on plagiarism, with public school pre-tertiary students generally taking a firmer stance against plagiarism. Ghanaian pre-tertiary students were less likely to perceive plagiarism as a serious offense (59.0%) compared to their Botswana counterparts (68.6%) ($\chi^2 = 4.26$, $p = 0.039$). The Cramér's V of 0.10 indicates a small effect size, highlighting some cross-national differences in how plagiarism is perceived. Pre-tertiary students who were aware of academic integrity policies were more likely to perceive plagiarism as a serious issue (70.0%) compared to those who were not aware (55.2%) ($\chi^2 = 12.48$, $p < 0.001$). The Cramér's V of 0.19 suggests a

Table 2 Plagiarism & ethics perception

Variable	Group	Perceive Plagiarism as Serious (%)	Perceive as Minor or Acceptable (%)	Total (*n*)	χ^2	df	*p*-value	Cramér's V
School Type	Public	155 (69.5%)	68 (30.5%)	223				
	Private	113 (55.7%)	90 (44.3%)	203	9.78	1	0.002**	0.15
Country	Ghana	124 (59.0%)	86 (41.0%)	210				
	Botswana	144 (68.6%)	66 (31.4%)	210	4.26	1	0.039**	0.10
Policy Awareness	Aware	151 (70.0%)	65 (30.0%)	216				
	Not Aware	117 (55.2%)	95 (44.8%)	212	12.48	1	< 0.001**	0.19

$p < 0.05$ (denoted as **), CI = 95%, 2-tailed

moderate association, showing that awareness of integrity policies is associated with a stronger perception of plagiarism as an academic offense.

Table 3 summarizes key findings from the Chi-square tests assessing the relationships between country, integrity policies, teacher supervision, and frequency of cheating. The association between country and academic dishonesty was significant (χ^2 = 8.12, $p = 0.004$), with Ghanaian pre-tertiary students more likely to engage in cheating (57.1%) compared to Botswana pre-tertiary students (42.5%). The effect size (Cramér's V = 0.15) indicates a small to moderate association, showing that country plays a role in pre-tertiary students' engagement in academic dishonesty. There was a significant relationship between the presence of integrity policies and awareness of assessment ethics (χ^2 = 12.48, $p < 0.001$), with pre-tertiary students aware of integrity policies demonstrating a stronger understanding of academic integrity policies (59.6%) compared to those who were unaware (44.5%). The Cramér's V of 0.19 indicates a moderate association, suggesting that institutional policies help improve pre-tertiary students' awareness of ethical assessment practices. Teacher supervision levels significantly influenced the frequency of cheating behaviors (χ^2 = 10.72, $p = 0.001$), with pre-tertiary students under low supervision more likely to cheat. The Cramér's V of 0.17 indicates a moderate association, suggesting that increasing teacher supervision reduces instances of cheating.

Table 4 further explores the relationship between teacher supervision and cheating behaviors, specifically highlighting the impact of high versus low supervision. Pre-tertiary students under high supervision were less likely to engage in cheating, with only 21.6% reporting frequent cheating (χ^2 = 44.91, $p < 0.001$). The odds ratio of 4.36 shows that pre-tertiary students under low supervision are 4.36 times more likely to cheat than those under high supervision, further emphasizing the importance of teacher supervision in reducing cheating. A significant portion of pre-tertiary students under low supervision (54.4%) reported frequent cheating. This strong association (Cramér's V = 0.33) suggests that inadequate supervision is a major factor contributing to dishonest behaviors in academic settings.

Table 5 provides a detailed breakdown of how teacher supervision influenced reported cheating behavior among pre-tertiary students in Ghana and Botswana. The supervision levels were not based solely on students' personal judgments; rather, they were derived from structured items in the questionnaire that assessed the frequency, consistency, and visibility of teacher monitoring during examinations. These items were informed by validated instruments such as the McCabe Academic Integrity Survey and were pilot-tested and refined for cultural relevance. Responses to multiple items measuring supervision practices such as whether teachers actively monitored the classroom, used seating arrangements, or restricted access to unauthorized materials were aggregated to categorize the level of supervision as either high or low. In Ghana, 25 students under high supervision reported frequent cheating, compared to 56 under low supervision. A Chi-square analysis (χ^2 = 8.72) and Cramér's V (0.28) revealed a moderate association, indicating that stronger supervision correlated with reduced cheating behavior. Similarly, in Botswana, 19 students in high-supervision environments reported frequent cheating, whereas 61 did so under low supervision. The Chi-square value (χ^2 = 6.92) and Cramér's V (0.27) also indicated a moderate relationship. These results affirm that consistent and visible teacher supervision measured using verifiable, structured indicators plays a significant role in mitigating academic dishonesty among pre-tertiary students.

Table 3 Chi-Square test results for key variables on academic integrity in Ghana and Botswana

Variable Pair	Categories	Group A (*n*)	Group B (*n*)	Total (*n*)	% Group A	% Group B	Chi-square (χ^2)	df	*p*-value	Cramér's V	Phi (φ)	Association Strength
1. Country × Engagement in Academic Dishonesty	Engaged	Ghana: 113	Botswana: 77	190	57.1%	42.5%	8.12	1	0.004**	0.15	0.15	Small to Moderate
	Did Not Engage	Ghana: 85	Botswana: 104	189	42.9%	57.5%						
2. Integrity Policies × Awareness of Assessment Ethics	Aware	Yes: 155	No: 105	260	59.6%	40.4%	12.48	1	< 0.001**	0.19	0.19	Moderate
	Unaware	Yes: 53	No: 66	119	44.5%	55.5%						
3. Teacher Supervision × Frequency of Cheating	High Supervision	Frequent: 41	Infrequent: 121	162	25.3%	74.7%	10.72	1	0.001**	0.17	0.17	Moderate
	Low Supervision	Frequent: 83	Infrequent: 134	217	38.2							

$p < 0.05$ (denoted as **), CI = 95%, 2-tailed

Discussion

The findings of this study provide critical insights into the role of various factors in shaping pre-tertiary students' engagement in academic dishonesty and the broader academic integrity landscape in Ghana and Botswana. The results indicate that institutional and contextual factors, such as the presence of academic integrity policies, teacher supervision, formal ethics training, and policy awareness, play significant roles in mitigating academic dishonesty. The significant difference in the prevalence of cheating between pre-tertiary students in Ghana and Botswana ($\chi^2 = 7.89$, $p = 0.005$) highlights the potential influence of cultural, educational, and societal contexts on academic behavior. Ghanaian pre-tertiary students reported higher rates of cheating (58.1%) than Botswana pre-tertiary students (45.2%). This finding aligns with previous studies that suggest national context and educational environments can shape pre-tertiary students' academic integrity policies. For instance, Boakye and Adom (2020) emphasized the pivotal role of cultural factors in shaping pre-tertiary students' perceptions of academic integrity in Sub-Saharan Africa. This suggests that the observed cross-national differences in academic dishonesty may be partly attributed to the varying cultural and social expectations placed upon students within each country. In the Ghanaian context, for example, intense pressure to perform well in high-stakes examinations often tied to family honor, limited access to tertiary education, and societal definitions of success may drive some students to rationalize dishonest behavior as a necessary survival strategy. In contrast, students in Botswana may encounter a different constellation of social expectations, potentially coupled with stronger enforcement of academic integrity policies and more consistent institutional accountability structures. These cultural and systemic differences likely contribute to divergent attitudes toward cheating and influence how students internalize ethical academic conduct across the two countries.

The significant association between the presence of institutional academic integrity policies and reduced rates of cheating ($\chi^2 = 34.82$, $p < 0.001$) supports the notion that clear, enforced policies are key in shaping ethical academic behavior. The moderate association (Cramér's $V = 0.29$) found in this study mirrors findings from previous studies, such as that of Mthethwa and Posa (2018), which found that the presence of honor codes and anti-plagiarism policies in universities is linked to a reduction in dishonest academic behaviors. Furthermore, it suggests that pre-tertiary students at institutions with clear academic integrity guidelines may be more likely to internalize academic integrity policies and, therefore, engage less in cheating. The results indicate a strong association between teacher supervision and the frequency of cheating, with pre-tertiary students under low supervision being significantly more likely to cheat ($\chi^2 = 44.91$, $p < 0.001$, Odds Ratio = 4.36). This reinforces the findings of several studies suggesting that increased supervision and monitoring during assessments deter pre-tertiary students from engaging in cheating behaviors. For example, Tawanda and Masiya (2021) concluded that the presence of vigilant supervision in examinations significantly lowers cheating rates in Sub-Saharan African universities. This is in line with the notion that when pre-tertiary students perceive that their actions are being closely monitored, the likelihood of academic dishonesty diminishes. The odds ratio (4.36) suggests that pre-tertiary students under low supervision are 4.36 times more likely to cheat, highlighting the critical role of supervision in preventing academic dishonesty. This finding is consistent with the work

Table 4 Association between teacher supervision level and frequency of cheating behaviors

Supervision Level	Frequent Cheating (*n*)	Rare/Never Cheating (*n*)	Total (*n*)	Row % (Cheating)	Standardized Residual	Chi-square (χ^2)	df	*p*-value	Cramér's V	Phi (φ)	Odds Ratio	Association Strength
High Supervision	44	160	204	21.6%	-4.15	44.91	1	< 0.001**	0.33	0.33	4.36	Moderate to Strong
Low Supervision	117	98	215	54.4%	+4.15							
Total	161	258	419									

$p < 0.05$ (denoted as **), CI = 95%, 2-tailed

of McCabe et al. (2001), who found that stronger institutional controls, including heightened supervision, are inversely related to the prevalence of cheating.

The significant relationship between formal ethics training and reduced cheating behaviors ($\chi^2 = 22.14$, $p < 0.001$) suggests that ethics training plays an essential role in fostering academic integrity. This is supported by studies such as those by Cox and Rakes (2020), who found that formal ethics training in academic settings can positively influence pre-tertiary students' ethical decision-making and reduce their engagement in academic dishonesty. Training pre-tertiary students on the importance of academic integrity, the consequences of cheating, and the ethical use of information can help instill a strong sense of personal and academic responsibility. The association between pre-tertiary students' awareness of academic integrity policies and their likelihood of engaging in academic dishonesty further supports the idea that awareness and education are key deterrents to cheating ($\chi^2 = 12.57$, $p < 0.001$). Pre-tertiary students who were aware of the policies had lower rates of cheating (42.6%) compared to those who were unaware (61.9%). This is consistent with research by Anderson (2018), which demonstrated that when pre-tertiary students are made aware of institutional rules regarding academic dishonesty, they are less likely to engage in such behaviors due to a heightened understanding of the consequences and ethical standards.

In Table 2, pre-tertiary students' perceptions of plagiarism also emerged as a significant factor in academic integrity. The finding that pre-tertiary students in public schools are more likely to perceive plagiarism as a serious offense (69.5%) compared to those in private schools (55.7%) ($\chi^2 = 9.78$, $p = 0.002$) aligns with prior research that suggests public schools tend to emphasize academic integrity policies more than private institutions (Choi and Choi 2019; Vlahos 2023). Moreover, pre-tertiary students who were aware of academic integrity policies were significantly more likely to view plagiarism as a serious violation, reflecting the importance of policy awareness in shaping pre-tertiary students' attitudes toward academic dishonesty ($\chi^2 = 12.48$, $p < 0.001$). The cross-national analysis of teacher supervision and cheating behavior in Ghana and Botswana presented in Table 5 reveals that in both countries, pre-tertiary students under low supervision reported higher instances of cheating, though the Chi-square values indicate that teacher supervision remains a significant determinant of cheating behavior in both contexts (Ghana: $\chi^2 = 8.72$, Botswana: $\chi^2 = 6.92$). These results align with McCabe's (2002) assertion that effective teacher supervision can be a strong deterrent to academic dishonesty, regardless of national context.

Recommendations

Drawing upon the key findings of this cross-national study on academic dishonesty among pre-tertiary students in Ghana and Botswana, a set of comprehensive and contextually grounded recommendations is proposed to guide policy, practice, and future research.

First, educational institutions in both countries should prioritize the strengthening, operationalization, and consistent enforcement of academic integrity policies. These policies must not only exist as formal documents but should also be effectively disseminated and internalized by all stakeholders' students, teachers, and administrators alike. Institutions should invest in the development of clear, context-sensitive codes of conduct that delineate various forms of academic dishonesty, particularly exam cheating

Table 5 Cross-National Breakdown – Supervision vs. Cheating by country

Country	Supervision Level	Frequent Cheating	Rare/Never Cheating	Total	Chi-square	Cramér's V
Ghana	High	25	86	111	8.72	0.28
	Low	56	52	108		
Botswana	High	19	74	93	6.92	0.27
	Low	61	46	107		

$p < 0.05$ (denoted as **), CI = 95%, 2-tailed

and plagiarism, and specify corresponding consequences. Furthermore, enforcement mechanisms should be transparent and consistent to reduce perceptions of impunity and encourage a culture of accountability.

Second, enhanced teacher supervision during assessments should be institutionalized as a strategic deterrent against cheating. Evidence from the study highlighted a correlation between low levels of supervision and higher incidences of dishonest behavior during examinations. As such, schools must ensure that adequate human and technological resources are allocated to maintain vigilance during testing periods. This could include deploying trained invigilators, rotating supervisory roles, and integrating digital monitoring systems where feasible. Additionally, teachers should receive continuous professional development on how to recognize and respond to different forms of academic misconduct, both overt and subtle.

Third, it is imperative that educational institutions implement comprehensive ethics education and awareness-raising programs targeting pre-tertiary learners. The findings indicate that students with a clearer understanding of academic integrity principles are less inclined to engage in dishonest practices. Therefore, ethics education should be embedded into the school curriculum, with emphasis placed not only on the rules but also on the broader moral and societal implications of cheating. Orientation sessions for new students, periodic workshops, and peer-led campaigns can be effective channels through which these messages are reinforced.

Fourth, the design and application of academic integrity interventions should be culturally responsive and contextually relevant. Since the study revealed that cultural factors significantly shape students' perceptions of academic dishonesty, institutional policies should reflect sensitivity to the socio-cultural norms, values, and educational histories of the student population. Stakeholder consultations including with students, parents, and community leaders should inform the development of policies to ensure their acceptability, legitimacy, and effectiveness within specific educational contexts.

Finally, there is a need for ongoing empirical research into the evolving nature of academic dishonesty at the pre-tertiary level in Sub-Saharan Africa. Future studies should explore the role of digital technologies, peer influence, and institutional trust in shaping student behavior. The generation of such data will provide evidence-based insights that can inform adaptive policy responses in an increasingly complex educational landscape.

Limitations

While this study provides valuable insights into the factors influencing academic dishonesty in Ghana and Botswana, there are several limitations that should be acknowledged. First, the study used a cross-sectional design, which means that data was collected at a single point in time. As a result, causal relationships between the variables cannot be established. Future research should consider using a longitudinal approach to explore

the long-term effects of academic integrity policies and interventions. Second, the study relied on self-reported data, which may have introduced social desirability bias. Pre-tertiary students may have underreported behaviors like cheating because of social pressures or the perception that academic dishonesty is unacceptable. Future studies could benefit from using multiple data collection methods, including observational or peer-reported data, to reduce this bias. Third, the study had a limited geographic scope, focusing only on Ghana and Botswana. While these two countries provide valuable insights, the findings may not be generalizable to other regions or educational systems in Sub-Saharan Africa. Future research should include a broader sample of countries to determine if the observed patterns hold true across different contexts. Lastly, the study focused primarily on student behavior, but academic dishonesty is a complex issue involving multiple stakeholders, including faculty and administrators. Future research could examine the perspectives of educators and institutional leaders to obtain a more comprehensive understanding of the factors that contribute to academic dishonesty.

Implications for policy and practice

The findings of this study have important implications for the design and implementation of academic integrity policies in higher education institutions, particularly in Sub-Saharan Africa. The strong relationship between the presence of institutional policies and reduced cheating behaviors underscores the importance of having clear, accessible, and enforced academic integrity guidelines. Institutions should prioritize not only the development of such policies but also ensure that pre-tertiary students are well-informed about them through awareness campaigns and formal ethics training. Moreover, the study emphasizes the need for increased teacher supervision during assessments to reduce the frequency of cheating. Given that pre-tertiary students under low supervision are significantly more likely to cheat, institutions should consider adopting more rigorous monitoring systems during exams, such as increased invigilation or the use of technology to prevent cheating. Finally, the results suggest that raising awareness about academic integrity policies and providing formal ethics training can significantly contribute to reducing academic dishonesty. Institutions should invest in continuous ethical education for both pre-tertiary students and faculty to foster a culture of academic integrity.

Conclusions

This study explored the multifaceted nature and determinants of academic dishonesty among senior high school students representing the pre-tertiary level in Ghana and Botswana. The analysis centered on key contextual and institutional variables, including national context, the existence and enforcement of institutional academic integrity policies, levels of teacher supervision during assessments, and students' awareness and understanding of academic integrity norms. The findings revealed several critical insights. First, national disparities in reported academic dishonesty were statistically significant, with senior high school students in Ghana exhibiting a higher propensity to engage in unethical academic practices compared to their counterparts in Botswana. This variation may be explained by socio-cultural differences in the conceptualization and tolerance of academic misconduct, as well as by discrepancies in the robustness and enforcement of integrity frameworks across the two national education systems. Second,

the presence of institutional academic integrity policies was found to exert a protective effect against student cheating. Senior high school students enrolled in institutions with clearly articulated and consistently implemented integrity policies reported lower instances of dishonest behavior. This underscores the importance of codified institutional norms and procedures as behavioral regulators within educational settings. Third, the extent of teacher supervision during assessments emerged as a salient factor influencing the prevalence of cheating. Students in environments characterized by minimal or inconsistent monitoring were significantly more likely to report engaging in dishonest conduct during examinations. This finding reinforces the critical role of vigilant and sustained supervision in deterring academic misconduct, particularly at the high-stakes examination level typical of the senior high school stage. Finally, students' awareness of academic integrity principles and exposure to formal ethics education were strongly associated with lower rates of academic dishonesty. Those who had been educated about the ethical dimensions of academic work and institutional expectations demonstrated more ethical behavior. This suggests that deliberate pedagogical efforts to instill values of honesty and responsibility are essential to fostering an integrity-driven school culture. In sum, this study contributes to the understanding of academic dishonesty at the senior high school level in Sub-Saharan Africa, emphasizing that national context, institutional policy infrastructure, supervisory practices, and student awareness all interact to shape ethical conduct. The findings offer actionable insights for education policymakers, school administrators, and teachers seeking to cultivate environments that discourage academic misconduct and promote a culture of academic integrity.

Abbreviations

IRB	Institutional Review Boards
UEW	University of Education, Winneba
BUAN	Botswana University of Agriculture and Natural Resources
AI	Artificial Intelligence
AIPF	Academic Integrity Policy Framework
SPSS	Statistical Package for the Social Sciences

Author contributions

Simon Ntumi served as the lead and corresponding author. He conceptualized the study, designed the research methodology, developed the data collection instruments, and led the data analysis. He also coordinated the manuscript drafting and revisions, and ensured the alignment of the work with the journal's scope and ethical standards.Tapela Bulala contributed significantly to the conceptual framework and cross-cultural design of the study. He facilitated data collection in Botswana, provided critical input into the comparative analysis, and reviewed the manuscript to enhance the discussion and scholarly relevance of the findings.Both authors reviewed and approved the final version of the manuscript and agree to be accountable for all aspects of the work.

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Data availability

https://doi.org/10.5281/zenodo.1234567.

Declarations

Ethics approval and consent to participate

Ethical approval for this study was obtained from the Institutional Review Boards (IRBs) of the University of Education, Winneba, Ghana, and the Botswana University of Agriculture and Natural Resources. Informed consent was obtained from all participants, and for minors, additional consent was secured from parents or legal guardians. Participants were informed of the purpose, procedures, and voluntary nature of the study, and were assured of their right to withdraw at any point without penalty. Strict confidentiality and anonymity protocols were followed throughout the research process.

Consent for publication

All authors have read and approved the final version of the manuscript and consent to its publication. Participants were fully informed that the data collected would be used strictly for academic and research purposes, including publication in scholarly journals. Consent was obtained from all participants, and for those under the age of 18, consent was

additionally obtained from their parents or legal guardians. All data presented in the publication are anonymized to protect participants' identities.

Competing interests
The authors declare no competing interests.

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