

**DIGITAL FORENSIC SKILLS NEEDED BY INTERNAL AUDITORS FOR EFFECTIVE
AUDITING IN PUBLIC UNIVERSITIES IN SOUTH-SOUTH NIGERIA**

By

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ABSTRACT

The study determined digital forensic skills needed by internal auditors for effective auditing in public universities in South-South Nigeria. One research question was raised and one null hypothesis was tested for the study. Descriptive survey research design was adopted. The entire population of 137 internal auditors in the seven federal universities and thirteen state universities in South-South Nigeria was studied without sampling. A structured questionnaire which was validated by three experts was used for data collection. Cronbach alpha was used to measure the internal consistency which yielded reliability co-efficient of 0.88. Mean and standard deviation were used to answer research question and t-test was used to test the null hypothesis at 0.05 level of significance. The study reveals that digital forensic skills are greatly needed by internal auditors for effective auditing in public universities in South-South Nigeria. Also, internal auditors did not differ significantly in their mean ratings on digital forensic skills needed for effective auditing in public universities in South-South Nigeria based on institutional ownership. The study concluded that digital forensic skills are highly needed by internal auditors for effective auditing in public universities in South-South Nigeria. Among others, it was recommended that internal auditors in public universities in South-South Nigeria should undergo specialized information technology training with computer experts in order to acquire digital forensic skills that will effectively curb digital fraudulent activities in public universities in South-South Nigeria

Keywords: Forensic accounting skills, effective auditing, internal auditors, digital forensic skills

Introduction

Universities are educational institutions that produce qualified, diligent and competent graduates meant for the technological, commercial and industrial revolution of nations. State and federal public universities are taken into cognizance because of their large numbers of students, staff (teaching and non-teaching) and they are into large scale budgeting and procurement of funds for educational projects, counseling services, research and teaching activities than private owned universities in Nigeria. In recent times, Vice chancellors, bursars and top management staff of major Nigerian universities have been accused and prosecuted on various count charges of financial misappropriation and corruption (Chidumaga, 2017). In addition, the Independent Corrupt Practices and Other Related Offences Commission (ICPC) and Economic Financial Crime Commission (EFCC) are inviting past Vice Chancellors, registrars and bursars of public universities to answer

questions of fraud that incurred while they were in office (Okoye, Nwoye, Akuchi & Onyema, 2020).

The occurrence of fraudulent activities and irregularities in public universities put a question mark on the effectiveness of auditing services rendered by internal auditors in these institutions. According to Ahmad (2015), effective auditing describes an auditor's ability to find hidden errors on financial statements of organizations. Effective auditing happens when internal auditors understand the applicable audit standards in ensuring that financial statements maintain integrity under their professional watch. Messier, Glover and Prawitt (2014) submitted that effective auditing strengthens the issues of accountability, trust and confidence in financial reports presented by organizations to her shareholders, creditors, interested stakeholders and the entire public after a financial year. Effective auditing improves the financial monitoring, responsibility and accountability mechanisms of public universities by checkmating their risk management processes, internal control systems and corporate governance practices (Ele & Okoli, 2023).

Effective auditing is the end goal of internal and external auditors. However, internal auditors are taken into cognizance in this study because they are the first financial watchdogs who ensure that proper and complete accounting systems are developed for the success and survival of public universities. Internal auditors are employed financial analysts by management and Governing Council of public universities to assist them in establishing solid financial control systems, identifying lapses in accounting systems and making recommendations toward securing their financial books from internal and external attacks. The Institute of Internal Auditors in Inua and Abianga (2015) defined an internal auditor as an employee of an organization charged with providing independent and objective evaluations of the organization's financial and operational business activities, including its corporate governance.

Thus, internal auditors are crucially important to the continuity and prosperity of universities. According to Mangala and Kumari (2017), after performing an audit, an auditor will present action items and recommendations to the organization using their key forensic accounting skills. The extent to which internal auditors can identify fraud in public universities is hinged on their acquisition of forensic accounting skills (Amiri, 2018). Forensic accounting skills are unique capabilities possessed by internal auditors to understand the origin and pattern of frauds committed in public universities. Internal auditors need forensic accounting skills with which to develop new auditing tools and technologies to manage and control fraud in public universities. Moving forward, Salleh and Aziz (2014) and Oyedokun, Enyi and Dada (2018) highlighted the forensic accounting skills-set for performing effective auditing to include; personal skills, communication skills and digital forensics skills among others.

Digital forensic skill is the awareness and application of existing and emerging digital technologies, capabilities, practices and strategies by internal auditors for carrying effective auditing in organizations. Digital attacks on organizations are becoming more common and more sophisticated (Alles, 2015). An understanding of digital forensic skills allow internal auditors to make knowledgeable decisions regarding what steps to take and how to proceed during an investigation and not taint the evidence of fraud. Mushtaque, Ahsan and Umer (2015) described digital forensic skill as the ability to use computers and softwares to determine the cause of the fraudulent incidents. Hence, Sumartono, Urumsah and Hamdani (2020) submitted that internal auditors should acquire data mining skill, security and filtering software skill, auditing software skill, database management skill and link analysis software skill for effective prevention, analysis and investigation of digital frauds

The increased sophistication and complexities of information systems have created vulnerabilities that can be exploited to damage public tertiary educational institutions by

compromising confidential personal information, allowing unauthorized access to sensitive projects and concealing financial statement frauds and misappropriation of assets. Internal auditors who are mainly paper-based forensic investigators will suffer at the mercy of digital criminals (Nwoye & Ogbodo, 2021). According to Chidumaga (2017), there are observed cases of tussle among staff on issues of misappropriation and embezzlement of funds meant for developmental projects by school management and this may have made it impossible for public tertiary educational institutions to be fully equipped with the needed infrastructure and learning facilities. Ele and Okoli (2023) reported that technologies are used to carry out false claims on personal expenses and duplicating expenses in universities in South-South, Nigeria.

In order to assess the nature and extent of digital frauds and maintain a strong internal control system, internal auditors must have understanding of digital forensic skills. In the course of determining digital forensic skills needed by internal auditors for effective auditing, institutional ownership could influence their opinions in public universities. Institutional ownership refers to educational institutions controlled by its owners. In the context of this study, institutional ownership means universities owned and controlled by the federal and state governments. The researchers are of the opinion that internal auditors in federal universities may be able to capture digital forensic skills needed for effective auditing more than their colleagues in state universities because they audit larger financial inflows and outflows from home and abroad. But this assertion needs to be supported by empirical evidence in the context of public universities in South-South Nigeria. It is against this background that the researchers determined the digital forensic skills needed by internal auditors for effective auditing in public universities in South-South Nigeria.

Statement of the Problem

Public universities cannot produce responsible students with academic excellence that can meet the employability requirements of the society when they are crippled with fraudulent activities perpetrated by management and non-management staff. Plagued with incessant fraud, bribery and corrupt practices in the Nigerian public sector, the Federal government of Nigeria had to set up the Economic Reform and Governance Project (ERGP) which gave birth to the Integrated Personnel, and Payroll Information System (IPPIS) and Treasury Single Account (TSA). Despite these anti-fraud measures, there are still depressing news that “termites” and “snakes” are swallowing billions of naira in government owned agencies in the nation. With the unending occurrences of manipulation of vouchers, revelation of ghost workers and unauthorized withdrawals of funds in public universities in recent years, the effectiveness of internal auditors who are employed to assist management and Governing Councils in handling such matters is under serious threat.

The problem of this study is that there seems to be no end to the massive loss of funds for educational projects, lack of accountability and transparency as well as incarceration of seasoned scholars, if internal auditors in public universities in Nigeria are not equipped with digital forensic skills to curb fraudulent activities. It gets worse because the increasing publicized cases of frauds and misappropriation of funds by professors and other management staff negatively affect the reputation and image of many public universities in Nigeria. Against this backdrop, the study sought to determine digital forensic skills needed by internal auditors for effective auditing in public universities in South-South Nigeria.

Research Question

The following research question guided the study:

1. What are the digital forensic skills needed by internal auditors for effective auditing in public universities in South-South Nigeria?

Hypothesis

The following null hypothesis was tested at 0.05 level of significance:

1. Internal auditors in federal and state universities do not differ significantly in their mean ratings on digital forensic skills needed for effective auditing in public universities in South-South Nigeria.

Method

The study adopted descriptive survey research design. Descriptive survey research design makes it possible for the researchers to collect opinions from a sample of internal auditors on digital forensic skills needed for effective auditing in public tertiary institutions in South-South Nigeria with the use of questionnaire. The entire population of 137 internal auditors in the seven federal universities and thirteen state universities in South-South Nigeria was studied without sampling. A structured and validated questionnaire containing 10 items on a five-point rating scale of Very Greatly Needed (VGN), Greatly Needed (GN), Moderately Needed (MN), Slightly Needed (SN) and Not Needed (NN) was used for data collection. The reliability of the instrument was determined through a pilot test. Copies of the instrument were administered to 10 internal auditors in public universities in South-East, Nigeria who were not part of the research population. Cronbach alpha was used to measure the internal consistency which yielded an overall reliability co-efficient of 0.88. Copies of the questionnaire were administered to the respondents in their offices personally by the researchers with help of five research assistants. The distribution and collection of copies of the questionnaire lasted for two weeks. Out of the 137 copies of the questionnaire administered, only 121 copies (representing 88 percent) were successfully retrieved and used for data analysis.

Mean and standard deviation were used to answer the research question and determine the homogeneity or otherwise of the respondents' views. Decisions on the research question were based on the grand mean in relations to the real limits of numbers. Therefore, items with mean ratings of 1.00 - 1.49 were rated Not Needed, those with 1.50 - 2.49 were Slightly Needed, items with mean ratings of 2.50 - 3.49 were rated Moderately Needed those with 3.50 - 4.49 were rated Greatly Needed and items with mean ratings of 4.50 - 5.00 were rated Very Greatly Needed. Inferential statistics of t-test was used to test the null hypothesis at 0.05 level of significance. The hypothesis was accepted where the p-value is greater than the alpha level of 0.05 ($p > 0.05$), at an appropriate degree of freedom; otherwise, the null hypothesis was rejected.

Results

The results of the study are presented and analyzed in the following tables.

Research Question 1

What are the digital forensic skills needed by internal auditors for effective auditing in public universities in South-South Nigeria?

Table 1

Respondents' mean ratings on digital forensic skills needed for effective auditing in public universities in South-South Nigeria

S/N	Items on digital forensic skills	X	SD	Remarks
1	Ability to exhibit data mining skill	4.01	.35	Greatly Needed
2	Ability to demonstrate data extraction skill	4.23	.61	Greatly Needed
3	Ability to exhibit link analysis software skill	3.82	.49	Greatly Needed
4	Ability to demonstrate digital data filtering skill	4.35	.22	Greatly Needed

5	Ability to exhibit data password protection skill	4.14	.65	Greatly Needed
6	Ability to demonstrate data virus protection skill	3.98	.38	Greatly Needed
7	Ability to exhibit data management skill	4.07	.58	Greatly Needed
8	Ability to perform continuous audit software skill	3.86	.24	Greatly Needed
9	Ability to demonstrate generalized audit software skill	4.26	.49	Greatly Needed
10	Ability to perform data systems design skill	3.95	.67	Greatly Needed
Cluster Mean		4.07		Greatly Needed

Data in Table 1 show that all the 10 listed digital forensic skills needed for effective auditing had mean ratings ranging from 3.82 to 4.35 are greatly needed by respondents. The cluster mean of 4.07 indicates that digital forensic skills are greatly needed by internal auditors for effective auditing in public universities in South-South Nigeria. The standard deviations for the items are within the same range which shows that the respondents are homogeneous in their opinions.

Hypothesis 1

Internal auditors in federal and state universities do not differ significantly in their mean ratings on digital forensic skills needed for effective auditing in public universities in South-South Nigeria.

Table 2

Summary of t-test analysis of respondents' mean ratings on digital forensic skills needed for effective auditing in public universities based on institutional ownership

Variable	N	\bar{X}	SD	df	t-value	p-value	Decision
Federal	82	78.12	6.99	119	0.69	.40	Not Significant
State	39	60.86	5.12				

Table 2 shows that there is no significant difference in the mean ratings of internal auditors in federal and state universities on digital forensic skills needed for effective auditing in public universities in South-South Nigeria. This is shown by the p-value of 0.40, which is greater than the significance level of 0.05. The null hypothesis of no significant difference between the two groups is therefore accepted.

Discussion of findings

The findings of the study showed that digital forensic skills were greatly needed by internal auditors for effective auditing in public universities in South-South Nigeria. The finding that data mining skill, data extraction skill, link analysis software skill, digital data filtering skill and data password protection skill were greatly needed by internal auditors for effective auditing in public universities in South-South Nigeria is in agreement with Akenbor and Oghoghomeh (2013) and Solomon and Akpan (2021) who reported that digital forensic skills were highly needed by internal auditors to enhanced the quality and accuracy in auditing financial records in digital formats. In addition, the study clearly showed that data virus protection skill, data management skill, continuous audit software skill, generalized audit software skill and data systems design skill were greatly needed by internal auditors for effective auditing in public universities in South-South Nigeria. The finding of this study tallies with Ele and Okoli (2023) who discovered that digital forensic skills were needed by internal auditors to uncover and prevent the occurrence of financial irregularities in organization. Based on the findings, the researcher is of the opinion that digital forensic

skills are greatly needed by internal auditors to prevent and detect potential frauds in public universities in South-South Nigeria.

Furthermore, the outcome of the study revealed that internal auditors did not differ significantly in their mean ratings on digital forensic skills needed for effective auditing in public universities in South-South Nigeria based on institutional ownership. This finding means that internal auditors, irrespective of their institutional ownership shared the same position that digital forensic skills were highly needed for effective auditing in public universities in South-South Nigeria. This result tallies with Solomon and Akpan (2021) and Thottoli and Thomas (2022) who reported that internal auditors, irrespective of their institutional ownership agreed that digital forensic skills were highly needed for effective auditing in organizations. In line with this finding, the researchers believed that digital forensic skills are highly needed by internal auditors to implant and utilize technologies during the audit process to detect fraudulent activities in public universities in South-South Nigeria.

Conclusion

Recently, the demand for internal auditors to have knowledge of digital forensic skills is on the increase due to the reported cases of financial irregularities in tertiary institutions in Nigeria. It is interesting to note that fraudsters are employing sophisticated technologies and devices to perpetuate financial crimes in public universities in Nigeria. Based on the findings of the study, it is concluded that digital forensic skills are highly needed by internal auditors for effective auditing in public universities in South-South Nigeria.

Recommendations

Based on the findings of the study, the following recommendations are made

1. Internal auditors in public universities in South-South Nigeria should undergo specialized information technology training with computer experts in order to acquire digital forensic skills that will effectively curb digital fraudulent activities in public universities in South-South Nigeria.
2. Management of public universities in South-South Nigeria should provide training courses that can improve the different digital forensic skills of internal auditors in reducing digital fraud in the universities. This will help internal auditors' to make better professional judgments, and improve the quality of their auditing functions in public universities in South-South Nigeria.

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