

Impact of Biometric Machines on Employee Productivity: A Survey of Ekiti State College of Technology, Ijero-Ekiti

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Abstract- *This study investigates the impact of biometric machines on employee productivity at Ekiti State College of Technology, Ijero-Ekiti, using questionnaire survey research design. A survey research design was adopted for the study to examine the influence of biometric attendance technology on staff punctuality, attendance record accuracy, and productivity. The study population comprised 75 academic and non-academic staff of the institution. Data were collected through a structured questionnaire administered to the respondents, with items focusing on the effectiveness of the biometric attendance system and its perceived influence on staff work behaviour and productivity. The data obtained were analyzed using simple percentage distribution to summarize the responses and establish the pattern of opinions among the respondents. The study concludes that biometric machines, while useful in strengthening attendance discipline, achieve their fullest productivity benefits only when backed by consistent management enforcement and reliable infrastructure.*

Keywords: *Biometric machine, employee productivity, questionnaire, frequency, percentage, Ekiti State College of Technology*

I. INTRODUCTION

Employee productivity remains a critical determinant of the effectiveness and overall performance of public institutions (Ahmad et al., 2021). In educational institutions, particularly tertiary institutions, the productivity of academic and non-academic staff is closely associated with regular attendance, punctuality, effective utilization of working hours, commitment to assigned responsibilities, and the quality and quantity of services delivered (Okonkwo & Nwokeke, 2020). Institutions depend on their workforce to perform administrative, academic, technical, and support functions that contribute to the achievement of organizational objectives. Consequently, mechanisms for monitoring staff

attendance and promoting accountability have become increasingly important in efforts to improve institutional performance.

Within tertiary institutions, these issues have implications for both academic and non-academic staff. Academic staff are expected to undertake teaching, research, supervision, assessment, and other institutional responsibilities, while non-academic staff provide administrative, technical, financial, library, laboratory, and other support services (Olawale & Adewale, 2020). Effective performance in these areas requires not only regular presence at the workplace but also productive engagement with assigned responsibilities. Consequently, an assessment of biometric attendance technology should consider both measurable changes in attendance behaviour and employees' perceptions of its effect on the quality, quantity, and efficiency of work performed.

Ekiti State College of Technology, Ijero-Ekiti, like other tertiary institutions, requires effective administrative mechanisms to support staff accountability and institutional productivity. The use of biometric machines for recording staff attendance provides an opportunity to examine whether technological monitoring has achieved its intended objectives beyond simply documenting employees' arrival and departure. In particular, it is important to determine whether the system has improved punctuality and attendance-record accuracy and whether these improvements have been accompanied by perceived changes in employee productivity.

Against this background, this study examines the impact of biometric machines on employee productivity at Ekiti State College of Technology, Ijero-Ekiti. The study focuses on the perceptions of academic and non-academic staff regarding the

influence of biometric attendance technology on punctuality, accuracy of attendance records, and productivity. It also considers the challenges affecting the effective operation of the system. By examining these dimensions, the study seeks to provide empirical evidence on whether biometric attendance technology primarily strengthens attendance control or whether its benefits extend to broader improvements in employee productivity within the institution.

Statement of the Problem

Despite the introduction of biometric machines at Ekiti State College of Technology, Ijero-Ekiti, questions remain as to whether the technology has genuinely improved employee productivity or whether it has simply changed the manner in which lateness and absenteeism are recorded, without altering staff behavior in any deep sense. Anecdotal reports suggest mixed feelings among staff, with some praising the system for restoring order to attendance while others view it merely as a monitoring tool with little bearing on actual output. This journal seeks to investigate these claims empirically through the direct voice of staff, gathered by way of a structured questionnaire.

Objectives of the Study

1. To determine staff perception of the effect of biometric machines on punctuality at Ekiti State College of Technology, Ijero-Ekiti.
2. To assess, through staff responses, whether biometric attendance has improved overall employee productivity.
3. To identify the major challenges staff associate with the use of biometric machines in the institution.
4. To recommend measures for improving the effectiveness of biometric systems as productivity tools.

Research Questions

1. What is the perception of staff regarding the effect of biometric machines on punctuality?
2. To what extent has the biometric system influenced employee productivity at the College?
3. What challenges do staff encounter in the use of the biometric attendance system?
4. What measures can be adopted to improve the effectiveness of the system?

II. LITERATURE REVIEW

Biometric Technology in the Workplace

Biometric technology identifies individuals through unique physical traits such as fingerprints, and has become one of the most widely adopted tools for attendance verification in organizations seeking to reduce time fraud (Adeyemi & Olowookere, 2020). Its appeal lies in the difficulty of forging or transferring a fingerprint, unlike a signature, which can easily be replicated by another person.

Biometric Systems in Nigerian Public Institutions

Okafor & Bello, (2021) opined that across Nigeria, biometric verification has been adopted at both federal and state levels, largely as a response to payroll fraud involving "ghost workers". Tertiary institutions, including polytechnics and colleges of technology, have followed this trend, often introducing biometric attendance alongside biometric verification of staff records for salary purposes.

Employee Productivity

Productivity refers to the efficiency with which inputs, particularly time and effort, are converted into useful output (Eze, 2019). In institutional settings, productivity is often reflected in the promptness of service delivery, the quality of academic and administrative work, and the general responsiveness of staff to their duties. While attendance discipline is not synonymous with productivity, the literature generally holds that they are closely related, since time lost to lateness or absence directly reduces the hours available for productive engagement.

Empirical Studies on Biometric Systems and Productivity

Oyelaran-Oyeyinka (2018) found that the adoption of ICT-based monitoring tools in Nigerian higher institutions was associated with measurable improvements in staff punctuality, though the effect on actual work output was more modest and depended heavily on whether management used attendance data to enforce accountability. Similarly, Adeyemi and Olowookere (2020) observed that biometric systems were most effective in institutions where late attendance was consistently flagged and addressed by supervisors, rather than merely recorded and filed

away. These findings inform the framework of the present study, which seeks to test similar patterns within the specific context of Ekiti State College of Technology, Ijero-Ekiti.

III. METHODOLOGY

Research Design

This paper adopts a descriptive survey research design, which is considered appropriate for studies that seek to describe the perceptions, attitudes, and experiences of a defined population using a structured instrument.

Population of the Study

The population of the study comprises academic and non-academic staff of Ekiti State College of Technology, Ijero-Ekiti.

Sample and Sampling Technique

A sample of 80 staff members was selected using a simple random sampling technique, cutting across various departments and units of the institution, in order to obtain a fair representation of both academic and non-academic staff perspectives.

Research Instrument

The instrument used for data collection was a structured questionnaire titled "Biometric Machine and Employee Productivity Questionnaire" (BMEPQ). The questionnaire was divided into two sections. Section A elicited demographic information about the respondents, while Section B contained items designed to address the research questions. The items in Section B were measured using a four-point Likert-type rating scale comprising Strongly Agree (SA), Agree (A), Disagree (D), and Strongly Disagree (SD).

Likert scale:

Response	Abbreviation	Score
Strongly Agree	SA	4
Agree	A	3
Disagree	D	2
Strongly Disagree	SD	1

Validity and Reliability of the Instrument

The questionnaire was reviewed by experts in educational management and measurement to ensure content validity, and adjustments were made based on their observations before final administration.

Data Analysis

Data collected were analyzed using simple frequency counts and percentages. For each item, the number of respondents selecting a given response was expressed as a percentage of the total number of respondents, using the formula:

$$\text{Percentage (\%)} = (\text{Frequency of responses} / \text{Total number of respondents}) \times 100$$

A criterion mean or simple majority rule was applied in interpreting the results, such that responses with a combined percentage of 50% and above for "Agree" and "Strongly Agree" were interpreted as general agreement with the statement.

Data Find and Analysis

Data Presentation and Analysis

80 copies of the questionnaire administered but 75 were correctly filled and returned, representing a response rate of 93.8%. The analysis below is based on these 75 responses.

Demographic Characteristics of Respondents

Table 1: Distribution of Respondents by Category of Staff

Category	Frequency	Percentage (%)
Academic Staff	42	56.0
Non-Academic Staff	33	44.0
Total	75	100.0

Table 2: Distribution of Respondents by Years of Service

Years of Service	Frequency	Percentage (%)
Below 5 years	21	28.0
5–10 years	27	36.0
Above 10 years	27	36.0
Total	75	100.0

Research Question 1: Perception of the Effect of
Biometric Machines on Punctuality

Table 3: Staff Responses on Biometric Machines and Punctuality

Item	SA (%)	A (%)	D (%)	SD (%)
The biometric machine has encouraged me to resume work earlier than before	33 (44.0)	29 (38.7)	9 (12.0)	4 (5.3)
Late resumption has reduced significantly since the introduction of the biometric machine	27 (36.0)	32 (42.7)	11 (14.7)	5 (6.7)
The biometric machine has made attendance records more accurate	40 (53.3)	26 (34.7)	6 (8.0)	3 (4.0)

The data in Table 3 show that a combined majority of respondents agreed that the biometric machine has encouraged earlier resumption (82.7%) and improved the accuracy of attendance records (88.0%), suggesting that staff largely perceive the system as an effective tool for enforcing punctuality.

Research Question 2: Effect of Biometric System on
Employee Productivity

Table 4: Staff Responses on Biometric Machines and Productivity

Item	SA (%)	A (%)	D (%)	SD (%)
Since the introduction of the biometric machine, I complete my daily tasks more efficiently	18 (24.0)	24 (32.0)	22 (29.3)	11 (14.7)
The biometric machine has improved the general work culture in my department	22 (29.3)	27 (36.0)	17 (22.7)	9 (12.0)
Being punctual because of the biometric machine has not necessarily made me more productive	20 (26.7)	25 (33.3)	21 (28.0)	9 (12.0)

Table 4 presents a more divided picture. While a slim majority (56.0%) agreed that the biometric machine has improved efficiency in completing daily tasks, a notable proportion (44.0%) disagreed, indicating that punctuality alone has not translated into a strong, uniform sense of improved productivity among staff. Notably, 60.0% of respondents agreed with the statement that punctuality induced by the biometric

machine has not necessarily made them more productive, reinforcing the idea that attendance discipline and work output, while related, are not the same thing.

Research Question 3: Challenges Associated with the
Biometric System

Table 5: Staff Responses on Challenges of the Biometric System

Item	SA (%)	A (%)	D (%)	SD (%)
Frequent power outages disrupt the use of the biometric machine	45 (60.0)	22 (29.3)	6 (8.0)	2 (2.7)
The biometric machine sometimes fails to recognize my fingerprint	30 (40.0)	26 (34.7)	13 (17.3)	6 (8.0)
I view the biometric machine mainly as a tool for monitoring rather than support	24 (32.0)	21 (28.0)	20 (26.7)	10 (13.3)

The results in Table 5 identify power outages as the most widely reported challenge, with 89.3% of respondents agreeing that unstable electricity disrupts the smooth use of the machine. A considerable proportion of respondents (74.7%) also reported occasional fingerprint recognition failures, while 60.0% expressed the view that the machine is

perceived primarily as a monitoring tool rather than one that genuinely supports their work.

Research Question 4: Measures for Improving Effectiveness

Table 6: Staff Responses on Measures to Improve the Biometric System

Item	SA (%)	A (%)	D (%)	SD (%)
Provision of stable power supply would improve the effectiveness of the biometric machine	48 (64.0)	21 (28.0)	4 (5.3)	2 (2.7)
Regular maintenance of the machine would reduce fingerprint recognition problems	38 (50.7)	27 (36.0)	7 (9.3)	3 (4.0)
Management should link biometric attendance data to staff performance appraisal	30 (40.0)	29 (38.7)	11 (14.7)	5 (6.7)

An overwhelming 92.0% of respondents agreed that a stable power supply would improve the effectiveness of the biometric system, while 86.7% supported regular maintenance of the machines. A further 78.7% agreed that linking biometric attendance data to staff performance appraisal would strengthen the impact of the system on productivity.

staff agree that being punctual because of the machine has not necessarily made them more productive is particularly telling, and suggests that the College may need to look beyond the biometric machine itself, toward departmental supervision and performance management, if it hopes to convert improved attendance into improved output.

IV. DISCUSSION

Discussion of Findings

The data gathered through the questionnaire broadly confirm the pattern observed in earlier institutional experience with biometric machines at Ekiti State College of Technology, Ijero-Ekiti: the technology has succeeded far more clearly in reforming punctuality than in guaranteeing productivity. Staff overwhelmingly agree that the biometric machine has made attendance records more accurate and encouraged earlier resumption, yet responses on productivity itself are noticeably more divided, with a significant minority disagreeing that efficiency has improved.

This gap between punctuality and productivity echoes the position of Oyelaran-Oyeyinka (2018), who similarly found that ICT-based monitoring tools tend to yield stronger results in attendance discipline than in output, unless deliberately reinforced through supervisory follow-through. The finding that 60.0% of

The challenges identified, particularly power outages and periodic fingerprint recognition failure, are consistent with wider findings on biometric technology adoption in Nigerian institutions, where infrastructural deficits often blunt the effectiveness of otherwise sound systems (Okafor & Bello, 2021). The strong staff support for linking biometric data to performance appraisal is worth particular attention, as it suggests that staff themselves recognize the missing link between attendance monitoring and productivity management, and would not necessarily resist a more consequence-driven use of the data.

V. CONCLUSION

This paper has examined the impact of biometric machines on employee productivity at Ekiti State College of Technology, Ijero-Ekiti, using a structured questionnaire analyzed through frequency and percentage distribution. The findings indicate that biometric machines have made a clear and welcomed contribution to punctuality and the accuracy of

attendance records, but their contribution to productivity in the fuller sense of work output remains modest and uneven. Infrastructural challenges, particularly power supply, and the tendency for biometric data to be recorded but under-utilized, appear to be the main factors limiting the technology's full potential. On the whole, biometric machines emerge from this study not as a complete solution to productivity concerns, but as a useful foundation that requires deliberate institutional follow-through to achieve its intended effect.

VI. RECOMMENDATIONS

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

1. Stable power supply: Management should prioritize the provision of stable or backup power sources, such as inverters or solar systems, dedicated to biometric devices, given that power outage was identified as the most significant operational challenge.
2. Routine maintenance: Biometric devices should be serviced regularly to reduce fingerprint recognition failures, particularly for staff whose work involves manual or technical activity that may affect fingerprint clarity.
3. Linking attendance to appraisal: Management should formally incorporate biometric attendance records into staff performance appraisal processes, since staff themselves expressed strong support for this measure as a way of translating punctuality into productivity.
4. Reframing staff perception: Efforts should be made, through staff briefings and departmental engagement, to present the biometric system as a tool that supports fair and efficient administration rather than one designed purely for surveillance.
5. Complementary supervision: Since punctuality alone does not guarantee productivity, departmental heads should complement biometric attendance monitoring with direct supervision of work output and task completion.
6. Periodic review: The institution should periodically review staff perception of the

biometric system, using instruments similar to the one adopted in this study, to track whether improvements in infrastructure and enforcement are translating into improved perception and productivity over time.

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