



ASSESSMENT OF THE LIMITATIONS OF MANUAL ATTENDANCE SYSTEMS AND THE NECESSITY FOR A BIOMETRIC-BASED SOLUTION FOR STAFF IN FEDERAL POLYTECHNIC WANNUNE, BENUE STATE

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Abstract

This study took a closer look at the drawbacks of manual attendance systems and highlighted the need for a biometric solution for staff at Federal Polytechnic Wannune. Using a descriptive survey research design, the study involved both academic and non-academic staff. Data were gathered through structured questionnaires and analyzed with descriptive statistics, such as frequency distribution and mean scores. The results showed that manual attendance systems are not only time-consuming but also vulnerable to proxy attendance, ultimately undermining staff accountability and making them unreliable for effective attendance management. On the flip side, biometric attendance systems were viewed as more efficient and secure, with the added benefit of preventing impersonation while enhancing transparency and accuracy in records. Additionally, the study found that staff members generally expressed a willingness to embrace biometric technology, although some concerns about potential technical challenges were raised. The conclusion drawn was that implementing a biometric attendance system could greatly improve attendance monitoring, boost staff accountability, and enhance overall productivity at the institution. To ensure successful implementation, it was recommended that the institution adopt biometric technology, backed by sufficient infrastructure, proper staff training, and ongoing technical support.

Keywords: *Manual Attendance System, Biometric Attendance System, Staff Accountability, Proxy Attendance, & Attendance Monitoring*

Introduction

Managing attendance is a vital part of running educational institutions effectively, especially in colleges Polytechnics and universities where the presence of staff can significantly impact productivity, service quality, and overall performance. Keeping a close eye on staff attendance promotes accountability, encourages punctuality, and reinforces commitment to the organization's goals. According to Robbins and Judge (2017), employee attendance is closely linked to organizational effectiveness, as consistent presence at work contributes to improved performance and service quality.

Traditionally, many institutions, particularly in developing countries, have relied on manual attendance systems that involve jotting down attendance on paper registers. While this approach is straightforward and budget-friendly, it comes with its fair share of drawbacks. Manual attendance systems are prone to mistakes, manipulation, and even fraudulent activities like proxy attendance, where one person signs in for someone else. As noted by Jain, Ross, and Prabhakar (2011), conventional identification methods, including manual records, lack reliability due to their vulnerability to forgery and impersonation.

In addition, manual attendance systems are time-consuming and inefficient, particularly in large institutions with a significant number of staff. The process of recording, storing, and retrieving attendance records manually can lead to delays and inaccuracies, thereby affecting administrative decision-making. Furthermore, paper-based records are prone to loss, damage, and mismanagement, which undermines data integrity and accountability (O'Gorman, 2003).

Advancements in information and communication technology have led to the development of biometric systems as a more reliable alternative for attendance management. Biometric systems use unique physiological or behavioral characteristics, such as fingerprints, facial recognition, or iris patterns, to verify an individual's identity. Among these, fingerprint recognition is the most widely adopted due to its accuracy, ease of use, and cost-effectiveness (Maltoni, Maio, Jain, & Prabhakar, 2009). Biometric attendance systems are a game-changer compared to manual systems. They not only prevent impersonation but also boost data security and deliver precise, real-time attendance records. Empirical studies have demonstrated that the adoption of biometric attendance systems improves transparency, reduces absenteeism, and enhances staff accountability in organizations (Jain, Ross, & Prabhakar, 2004). These systems also help with automated data management, allowing institutions to create reports quickly and make well-informed administrative decisions.

Even with all the benefits, many Nigerian tertiary institutions, like Federal Polytechnic Wannune, still rely on old-school manual attendance systems. This ongoing dependence raises some serious questions about efficiency, accountability, and how well staff attendance is monitored. Problems like proxy attendance, inaccurate record-keeping, and limited oversight are still common. So, it's clear that we need to take a hard look at the drawbacks of the current manual attendance system and consider the need for a biometric solution. This study is set to explore the weaknesses of manual attendance systems and figure out if a biometric attendance system would be a better fit for the staff at Federal Polytechnic Wannune.

Statement of Problem

Managing attendance effectively is crucial for keeping staff accountable, boosting productivity, and enhancing overall efficiency in higher education institutions. Yet, many colleges and universities, especially in developing countries, still depend on outdated manual attendance systems. These

systems create significant hurdles for proper monitoring and control. While they may seem straightforward, they fall short of meeting the needs of today's administrative demands. A key issue with manual attendance systems is their vulnerability to manipulation and dishonest practices, particularly when it comes to proxy attendance. This happens when someone marks attendance for another person, which undermines the accuracy and trustworthiness of attendance records. According to Jain, Ross, and Prabhakar (2011), traditional methods of identification lack robustness and are vulnerable to impersonation, making them unsuitable for secure verification processes.

Manual attendance systems are often riddled with human errors like wrong entries, duplicate records, and miscalculations. These slip-ups can seriously compromise the integrity of the data and make the attendance information less trustworthy for making important administrative decisions. In addition, paper-based records are susceptible to physical damage, loss, and poor storage conditions, which further complicate record management and retrieval processes (O'Gorman, 2003). One major problem is that manual systems just cannot keep up with real-time monitoring and accurate reporting of staff attendance. This shortcoming really limits management's ability to spot attendance trends, identify patterns of absenteeism, and enforce discipline effectively. As noted by Maltoni et al. (2009), efficient identity management systems are necessary for ensuring accurate and reliable data collection in organizational settings.

While biometric attendance systems are well-known for boosting security, preventing impersonation, and enhancing data accuracy, their use is still quite limited in some Nigerian tertiary institutions. For instance, Federal Polytechnic Wannune continues to depend on manual attendance methods, which brings up issues like inefficiency, a lack of transparency, and poor staff accountability. This ongoing situation underscores the importance of taking a closer look at the drawbacks of manual attendance systems and exploring the need for a biometric solution. This study aims to fill that gap by assessing the weaknesses of the current system and identifying the necessity for a more dependable and efficient attendance management system at Federal Polytechnic Wannune.

Objectives of the Study

The aim of this study is to assess the limitations of manual attendance systems and examine the need for a biometric-based attendance solution for staff at Federal Polytechnic Wannune. However, the specific objectives of this study are to:

1. Identify the limitations associated with manual attendance systems used by staff at Federal Polytechnic Wannune.
2. Assess the staff's perceptions regarding the adoption of biometric attendance systems at Federal Polytechnic Wannune.

Conceptual Review

Managing attendance is crucial for the administration of higher education institutions. It plays a key role in ensuring accountability, upholding discipline, and improving service delivery. By effectively monitoring attendance, these institutions can keep track of staff presence, spot patterns of absenteeism, and boost overall productivity within the organization. According to Robbins and Judge (2017), employee attendance is directly linked to organizational performance, as consistent presence at work contributes to improved efficiency and effectiveness.

In colleges and universities, attendance management systems play a crucial role in keeping track of staff engagement and making sure everyone is following the school's policies. Armstrong (2014) emphasizes that proper workforce monitoring, including attendance tracking, is crucial for achieving organizational goals. Despite this importance, many institutions still rely on manual attendance systems, which involve recording attendance using paper registers.

Manual attendance systems are associated with several limitations that affect their effectiveness. One major challenge is proxy attendance, where an individual records attendance on behalf of another, thereby compromising the accuracy of attendance records. Traditional identification methods are generally unreliable and vulnerable to impersonation (Jain, Ross, & Prabhakar, 2011).

In addition, manual attendance systems are prone to human errors such as incorrect entries, duplication, and miscalculations. These errors can significantly affect the reliability of attendance data used for decision-making. Furthermore, paper-based records are susceptible to loss, damage, and poor storage conditions, making data retrieval difficult and inefficient (O'Gorman, 2003).

One major drawback is how time-consuming manual attendance processes can be. When attendance is recorded and verified by hand, it can really slow down productivity and eat into valuable work hours. Plus, these manual systems don't offer real-time monitoring, which makes it tough for management to keep an eye on staff attendance and ensure everyone is held accountable.

On the other hand, biometric attendance systems rely on unique physical or behavioral traits, like fingerprints, facial recognition, or iris patterns, to confirm a person's identity. These systems are well-known for their precision, dependability, and security when it comes to verifying identities. According to Maltoni, Maio, Jain, and Prabhakar (2009), biometric systems provide a robust method of identification because biometric traits are unique to each individual and difficult to replicate. Fingerprint recognition stands out as one of the most popular biometric methods, and it's easy to see why. It is user-friendly, budget-friendly, and boasts impressive accuracy. Unlike traditional manual systems, biometric attendance solutions put an end to impersonation, ensuring that only those who are authorized can mark their attendance.

Biometric attendance systems offer several advantages over traditional manual methods. They enhance accuracy, prevent proxy attendance, and improve data security. These systems also enable automated data collection and report generation, thereby reducing administrative workload. Biometric systems provide accurate identification using unique physiological traits, thereby eliminating impersonation and improving attendance management (Jain et al., 2004; O'Gorman, 2003). In schools, biometric systems play a key role in cutting down on absenteeism and boosting staff punctuality. They offer real-time monitoring, which helps management keep an eye on attendance trends and make smart decisions. This means that biometric systems really enhance the overall efficiency and performance of educational institutions.

While numerous studies have pointed out how effective biometric attendance systems can be, there is a noticeable lack of real-world research on their use in Nigerian tertiary institutions that still depend on manual attendance methods. Most of the existing research comes from developed countries or different organizational environments, which might not truly capture the unique challenges faced by places like Federal Polytechnic Wannune. This highlights the need to dive into the shortcomings of manual attendance systems in this specific context and to explore the potential benefits of implementing biometric solutions for managing staff attendance.

Methodology

The study adopted a descriptive survey research design. The descriptive survey method is appropriate for this study because it allows for the systematic collection of data from respondents in order to assess their opinions, experiences, and perceptions regarding the limitations of manual attendance systems and the need for a biometric-based solution. The population of this study comprises all academic and non-academic staff of Federal Polytechnic Wannune. These individuals are directly involved in the attendance management process and are therefore in the best position to provide relevant information regarding the effectiveness and challenges of the existing manual attendance system.

A sample size of 50 staff members was selected for the study. The sampling technique adopted was simple random sampling, which ensures that every member of the population has an equal chance of being selected. This method helps to reduce bias and ensures that the sample is representative of the entire population. The primary instrument used for data collection in this study was a structured questionnaire. The questionnaire items were designed using a Likert scale ranging from Strongly Agree (5) to Strongly Disagree (1), which enabled the measurement of respondents' attitudes and perceptions.

To ensure the validity of the research instrument, the questionnaire was reviewed by experts in computer science and educational management. Their feedback helped to ensure that the instrument adequately covered the objectives of the study. Reliability of the instrument was established through a pilot test conducted with five staff members who were not part of the main study. The internal consistency of the instrument was measured using Cronbach's Alpha, with a reliability coefficient of 0.70 and above considered acceptable.

The researcher personally administered the questionnaires to the selected respondents. Adequate time was given to respondents to complete the questionnaires, after which they were collected for analysis. Confidentiality and anonymity of respondents were strictly maintained throughout the data collection process to ensure honest and unbiased responses. The data collected were analyzed using descriptive statistical methods. Frequency distribution and percentages were used to analyze demographic data and general responses, while mean scores were used to evaluate respondents' perceptions of the manual attendance system and the proposed biometric solution.

Result

Table 1: *Challenges of Manual Attendance Systems*

S/N	Statement	Mean	Interpretation	Frequency (%)	Agree
1	Manual attendance is time-consuming	4.12	Agree	80%	
2	Manual attendance allows proxy signing	4.56	Strongly Agree	90%	
3	Attendance records are often lost or damaged	3.30	Neutral	50%	
4	Manual attendance reduces accountability	3.54	Agree	70%	
5	It is difficult to monitor staff presence	3.92	Agree	76%	

Source: *Fieldwork, 2025*

The results presented in Table 1 reveal several significant challenges associated with the use of manual attendance systems in Federal Polytechnic Wannune. Firstly, the statement "*Manual*

attendance is time-consuming” recorded a mean score of 4.12, indicating agreement among respondents. A high percentage of agreement (80%) suggests that the manual process of recording and verifying attendance consumes valuable time that could otherwise be used for productive activities.

Secondly, the issue of proxy attendance is highly prominent. The statement *“Manual attendance allows proxy signing”* recorded the highest mean score of 4.56, which falls within the “strongly agree” category, with 90% of respondents in agreement. This finding indicates that impersonation is a major weakness of the manual attendance system, thereby compromising the accuracy and credibility of attendance records.

Furthermore, the statement *“Attendance records are often lost or damaged”* recorded a mean score of 3.30, indicating a neutral response, with 50% agreement. This suggests that while some respondents experience issues related to record management, it may not be a widespread problem across all departments.

In addition, the statement *“Manual attendance reduces accountability”* recorded a mean score of 3.54, indicating agreement, with 70% of respondents supporting this view. This implies that the manual system does not effectively enforce responsibility among staff, possibly due to loopholes such as proxy attendance and lack of proper monitoring mechanisms.

Finally, the statement *“It is difficult to monitor staff presence”* recorded a mean score of 3.92, also indicating agreement, with 76% of respondents in support. This shows that the manual system lacks the capability to effectively track and monitor staff attendance, thereby limiting administrative control and oversight. Overall, the findings demonstrate that manual attendance systems are inefficient, prone to manipulation, and inadequate for ensuring accurate attendance monitoring and staff accountability.

Table 2: *Staff Perception of Biometric Attendance Systems*

S/N	Statement	Mean	Interpretation	Frequency Agree (%)
1	Biometric attendance reduces absenteeism	3.58	Agree	70%
2	Biometric attendance prevents proxy attendance	3.98	Agree	84%
3	Biometric attendance improves record accuracy	3.18	Neutral	50%
4	Staff are willing to adopt biometric attendance systems	3.50	Agree	68%
5	Biometric systems may experience technical challenges	3.88	Agree	80%

Source: *Fieldwork, 2025*

The results presented in Table 2 indicate that staff generally have a positive perception of biometric attendance systems, although some concerns were identified. The statement *“Biometric attendance reduces absenteeism”* recorded a mean score of 3.58, indicating agreement among respondents, with 70% in support. This suggests that staff believe biometric systems can improve attendance compliance by ensuring accurate monitoring.

The prevention of proxy attendance was one of the most strongly supported benefits. The statement “*Biometric attendance prevents proxy attendance*” recorded a mean score of 3.98, with 84% agreement. This finding highlights that respondents recognize biometric systems as an effective solution to one of the major limitations of manual attendance systems, which is impersonation.

However, the statement “*Biometric attendance improves record accuracy*” recorded a mean score of 3.18, indicating a neutral response, with 50% agreement. This suggests that while some staff acknowledge the accuracy benefits of biometric systems, others may lack sufficient awareness or confidence in the technology.

In addition, the statement “*Staff are willing to adopt biometric attendance systems*” recorded a mean score of 3.50, indicating agreement, with 68% of respondents expressing willingness to adopt the system. This reflects a moderate level of acceptance, although some resistance may still exist due to unfamiliarity with the technology.

Furthermore, the statement “*Biometric systems may experience technical challenges*” recorded a mean score of 3.88, with 80% agreement. This indicates that respondents are aware of potential issues such as system failure, maintenance requirements, and technical difficulties, which may affect implementation. Overall, the findings suggest that staff perceive biometric attendance systems as a more reliable and effective alternative to manual methods. While there is strong support for its ability to prevent proxy attendance and improve accountability, concerns regarding technical challenges highlight the need for proper infrastructure, training, and system maintenance to ensure successful implementation.

Summary of Findings

The findings of this study reveal that manual attendance systems at Federal Polytechnic Wannune have several significant limitations that affect staff accountability and institutional efficiency.

Firstly, the study established that manual attendance systems are time-consuming, as indicated by a high mean score and level of agreement among respondents. This suggests that the process of recording attendance manually reduces productivity and consumes valuable working time. The issue of proxy attendance was identified as a major weakness of the manual system. A large proportion of respondents strongly agreed that manual attendance allows impersonation, thereby compromising the accuracy and reliability of attendance records. Manual attendance systems also reduce staff accountability and make it difficult for management to effectively monitor staff presence. The lack of real-time monitoring and proper verification mechanisms limits the ability of the institution to enforce discipline and track attendance accurately.

Secondly, in contrast, the findings show that staff generally perceive biometric attendance systems as a more effective alternative. Respondents agreed that biometric systems can reduce absenteeism, prevent proxy attendance, and improve attendance monitoring. Consequently, staff members demonstrate a moderate willingness to adopt biometric attendance systems, indicating openness to technological innovation. However, concerns regarding possible technical challenges, such as system failure and maintenance issues, were also identified.

Overall, the findings confirm that manual attendance systems are inefficient and prone to abuse, while biometric attendance systems are perceived as more reliable, secure, and capable of improving staff accountability and institutional productivity. These findings strongly support the need for adopting a biometric-based attendance solution at Federal Polytechnic Wannune.

Conclusion

This study assessed the limitations of manual attendance systems and examined the need for a biometric-based attendance solution for staff at Federal Polytechnic Wannune. The findings revealed that manual attendance systems are inefficient, time-consuming, and highly susceptible to manipulation, particularly in the form of proxy attendance. These weaknesses significantly reduce the reliability of attendance records and limit staff accountability.

The study further established that manual attendance systems make it difficult for management to effectively monitor staff presence and enforce discipline due to the lack of real-time tracking and verification mechanisms. Although issues such as record loss were not strongly emphasized by all respondents, they remain a potential risk associated with paper-based systems.

In contrast, biometric attendance systems were perceived as a more reliable, secure, and efficient alternative. The findings showed that biometric systems can effectively prevent impersonation, improve attendance accuracy, and enhance transparency in attendance management. Staff also demonstrated a moderate level of willingness to adopt biometric technology, indicating readiness for technological advancement within the institution.

However, concerns regarding possible technical challenges, such as system maintenance and operational reliability, were also identified. Despite these concerns, the overall findings strongly indicate that the adoption of a biometric attendance system would significantly improve staff accountability, reduce absenteeism, and enhance institutional productivity.

Recommendations

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

1. Federal Polytechnic Wannune should adopt a biometric-based attendance system to improve the accuracy and reliability of staff attendance records.
2. The institution should provide adequate training for staff to ensure effective use and acceptance of the biometric system.
3. Sufficient infrastructure, including reliable power supply and technical support, should be provided to ensure smooth operation of the system.
4. Regular maintenance and system updates should be carried out to prevent technical failures and ensure long-term functionality.
5. Management should continuously monitor and evaluate attendance data generated by the biometric system to enhance accountability and support decision-making.

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