

RESEARCH ARTICLE

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**FACULTY ASSESSMENT OF THE TRADITIONAL ATTENDANCE
MONITORING SYSTEM IN A PRIVATE HIGHER EDUCATION
INSTITUTION: BASIS FOR THE DEVELOPMENT OF A TECHNOLOGY-
BASED ATTENDANCE MONITORING SYSTEM**

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Abstract

Attendance monitoring is an essential component of educational management, as it supports classroom administration, student accountability, and institutional record keeping. Despite advances in educational technology, many higher education institutions continue to rely on traditional manual attendance monitoring systems, which may present challenges related to efficiency, accuracy, and instructional support. This study evaluated faculty perceptions of the traditional attendance monitoring system implemented at Bohol Northern Star College during the Academic Year 2025–2026. Specifically, it assessed faculty evaluations in terms of ease of use and accessibility, accuracy and reliability in tracking attendance, and alignment with pedagogical needs and instructional efficiency. The study also examined whether significant differences existed in faculty evaluations when grouped according to age, sex, academic position, and length of service.

A quantitative descriptive-comparative research design was employed involving thirty-six (36) faculty members selected through purposive sampling. Data were collected using a researcher-developed questionnaire that underwent expert validation and reliability testing. Descriptive statistics, including frequency, percentage, and weighted mean, were used to summarize the data, while the Mann–Whitney U test and Kruskal–Wallis H test were utilized to determine significant differences among respondent groups at the 0.05 level of significance.

The findings revealed that faculty members generally expressed unfavorable evaluations of the traditional attendance monitoring system. Ease of Use and Accessibility obtained a composite mean of 1.80, Accuracy and Reliability in Tracking Attendance obtained a composite mean of 1.83, and Alignment with Pedagogical Needs and Instructional Efficiency obtained the lowest composite mean of 1.72, all interpreted as Disagree. These findings indicate that the existing manual attendance monitoring system is perceived as inadequate in supporting efficient attendance recording, ensuring reliable documentation, and facilitating instructional activities. Inferential analysis further revealed no statistically significant differences in faculty evaluations when respondents were grouped according to age, sex, academic position, and length of service, indicating that these perceptions were consistent across demographic groups.

Based on the findings, the study recommends the development and implementation of a technology-based attendance monitoring system to improve efficiency, accuracy, accessibility, and instructional support while ensuring compliance with the Data Privacy Act of 2012 (Republic Act No. 10173). The findings provide empirical evidence that may guide higher education institutions in planning and implementing digital attendance management solutions that enhance administrative effectiveness and support quality educational service delivery.

Keywords: attendance monitoring system, faculty evaluation, traditional attendance system, educational technology, technology-based attendance monitoring, higher education, instructional efficiency, digital transformation, attendance management.

INTRODUCTION

Attendance monitoring is a fundamental component of educational management because it provides essential information for tracking student participation, maintaining accurate academic records, and supporting institutional accountability. Effective attendance monitoring enables faculty members to identify absenteeism patterns, implement timely interventions, and promote student engagement, all of which contribute to improved learning outcomes and institutional effectiveness. Consequently, educational institutions are expected to adopt attendance monitoring systems that are accurate, reliable, efficient, and responsive to the evolving demands of teaching and learning.

Traditionally, higher education institutions have relied on manual attendance monitoring methods such as roll calls, attendance sheets, sign-in logs, and written records. These methods are relatively inexpensive and simple to implement; however, they are often associated with several operational limitations. Manual attendance recording can consume valuable instructional time, increase faculty workload, delay record retrieval, and expose attendance records to human error and manipulation. As educational institutions continue to embrace digital transformation, these limitations have become more evident, prompting administrators and educators to explore technology-based alternatives that improve efficiency, accuracy, and data management (Morse, 2013).

Recent advances in educational technology have transformed attendance monitoring practices through the use of biometric authentication, Radio Frequency Identification (RFID), Quick Response (QR) codes, facial recognition, mobile applications, cloud computing, and artificial intelligence. These technologies automate attendance recording, generate real-time reports, improve data accuracy, and reduce administrative burden while enhancing institutional decision-making (Kumar & Jain, 2018; Chiang et al., 2022; Jaiswal & Sinha, 2022). Beyond improving operational efficiency, digital attendance systems support evidence-based educational management by providing timely and reliable attendance information for instructors and administrators.

In the Philippines, the integration of digital technologies into educational administration has gradually increased, particularly in response to national initiatives promoting digital transformation in higher education. Nevertheless, many private higher education institutions continue to utilize traditional attendance monitoring systems because of financial constraints, limited technological infrastructure, and organizational readiness. While these manual approaches remain operational, concerns regarding efficiency, reliability, record management, and instructional support have encouraged institutions to evaluate their existing practices before investing in technology-driven solutions. Furthermore, attendance records contain personal information that must be managed responsibly in accordance with the Data Privacy Act of 2012 (Republic Act No. 10173), emphasizing the need for secure and reliable attendance management systems.

At Bohol Northern Star College, faculty members continue to record student attendance using traditional methods such as roll calls, attendance sheets, and manual documentation. Although these procedures have long been integrated into classroom management, no formal institutional assessment had previously been conducted to determine whether the existing attendance

monitoring system adequately meets the instructional and administrative needs of faculty members. Evaluating faculty perceptions is particularly important because instructors serve as the primary users of attendance monitoring systems and possess firsthand experience regarding their strengths, limitations, and practical challenges.

Previous studies have primarily concentrated on the design, implementation, and evaluation of technology-based attendance monitoring systems using biometric technologies, RFID, QR codes, facial recognition, and mobile applications. Most investigations have emphasized system performance, usability, and technical effectiveness after implementation. Comparatively fewer studies have examined faculty evaluations of traditional manual attendance monitoring systems prior to the adoption of technological innovations, particularly within the context of private higher education institutions in the Philippines. Likewise, limited empirical evidence exists regarding whether faculty demographic characteristics influence perceptions of traditional attendance monitoring practices. This gap highlights the need to assess existing systems before proposing technology-enhanced alternatives that are responsive to institutional requirements and user experiences.

This study is anchored on the Technology Acceptance Model (TAM) developed by Davis (1989), which explains that users' acceptance of technology is influenced by their perceptions of its usefulness and ease of use. It is further supported by the Diffusion of Innovation Theory of Rogers (2003), which explains how innovations are adopted within organizations, and the Technological Innovation Systems Framework proposed by Hekkert et al. (2007), which emphasizes the organizational, technological, and institutional factors that facilitate successful technological innovation. These theoretical perspectives provide an appropriate framework for evaluating the current attendance monitoring system and for proposing an improved technology-based attendance monitoring solution.

The primary purpose of this study was to evaluate faculty perceptions of the traditional attendance monitoring system implemented at Bohol Northern Star College during the Academic Year 2025–2026. Specifically, the study examined faculty evaluations in terms of ease of use and accessibility, accuracy and reliability in tracking attendance, and alignment with pedagogical needs and instructional efficiency. It also determined whether significant differences existed in faculty evaluations when respondents were grouped according to age, sex, academic position, and length of service. The findings served as the basis for proposing a technology-based attendance monitoring system that addresses the identified limitations of the existing manual process and supports more effective attendance management.

The findings of this study are expected to benefit several stakeholders. School administrators may utilize the results in planning institutional policies and allocating resources for attendance management improvements. Faculty members may benefit from more efficient attendance recording processes that reduce administrative workload and support instructional activities. Information technology personnel and system developers may use the findings to design an attendance monitoring system that reflects actual user needs and institutional requirements. Future researchers may also use this study as a reference for further investigations on educational technology, digital transformation, and attendance management in higher education institutions.

THEORETICAL AND CONCEPTUAL FRAMEWORK

This study is anchored on the Technology Acceptance Model (TAM), Diffusion of Innovation Theory (DOI), and the Technological Innovation Systems (TIS) Framework. These theories provide a comprehensive foundation for understanding faculty perceptions of the traditional attendance monitoring system and support the proposed development of a technology-based attendance monitoring system.

The Technology Acceptance Model (TAM), developed by Davis (1989), explains how users accept and utilize information systems. According to TAM, two primary factors influence an individual's intention to use technology: Perceived Usefulness (PU) and Perceived Ease of Use (PEOU). Perceived usefulness refers to the degree to which an individual believes that a technology will improve job performance, while perceived ease of use refers to the extent to which a person believes that using the technology requires minimal effort. These perceptions influence users' attitudes, behavioral intentions, and actual use of technology.

The Diffusion of Innovation Theory, proposed by Rogers (2003), explains how innovations are communicated and adopted within a social system over time. The theory identifies five characteristics that influence the adoption of innovations: Relative Advantage, Compatibility, Complexity, Trialability, and Observability. According to Rogers, innovations are more likely to be adopted when users perceive them as advantageous, compatible with existing practices, easy to use, testable before implementation, and capable of producing observable benefits.

The Technological Innovation Systems (TIS) Framework, introduced by Hekkert et al. (2007), explains how technological innovations develop, evolve, and become successfully implemented within organizations through interactions among stakeholders, institutional support, knowledge creation, and resource allocation. The framework emphasizes that successful technological innovation depends not only on the technology itself but also on organizational readiness, institutional policies, user participation, infrastructure, and continuous evaluation.

Legal Bases of the Study

Republic Act No. 10173, also known as the Data Privacy Act of 2012, mandates the protection of personal information collected by public and private organizations. Attendance records contain sensitive personal information that must be collected, processed, stored, and accessed responsibly.

Republic Act No. 9155 emphasizes accountability and effective educational management. Although primarily intended for basic education, its principles of efficient school governance, proper documentation, and quality educational services support institutional efforts to improve administrative processes such as attendance monitoring.

The Education Act of 1982 recognizes the responsibilities of educational institutions in maintaining accurate student records and promoting effective educational administration. Attendance monitoring serves as an essential component of institutional record management and

DepEd Order No. 11, Series of 2018, which outlines guidelines for learner attendance, underscores the importance of maintaining accurate and timely attendance records to support student monitoring and academic interventions. Although this study focuses on a higher education institution, the policy reinforces the educational value of systematic attendance management.

Conceptual Framework

The study follows an Input–Process–Output (IPO) Model, illustrating the relationship between faculty characteristics, evaluation of the existing attendance monitoring system, statistical analysis, and the proposed technological enhancement.

Figure 1: Framework (IPO Model)

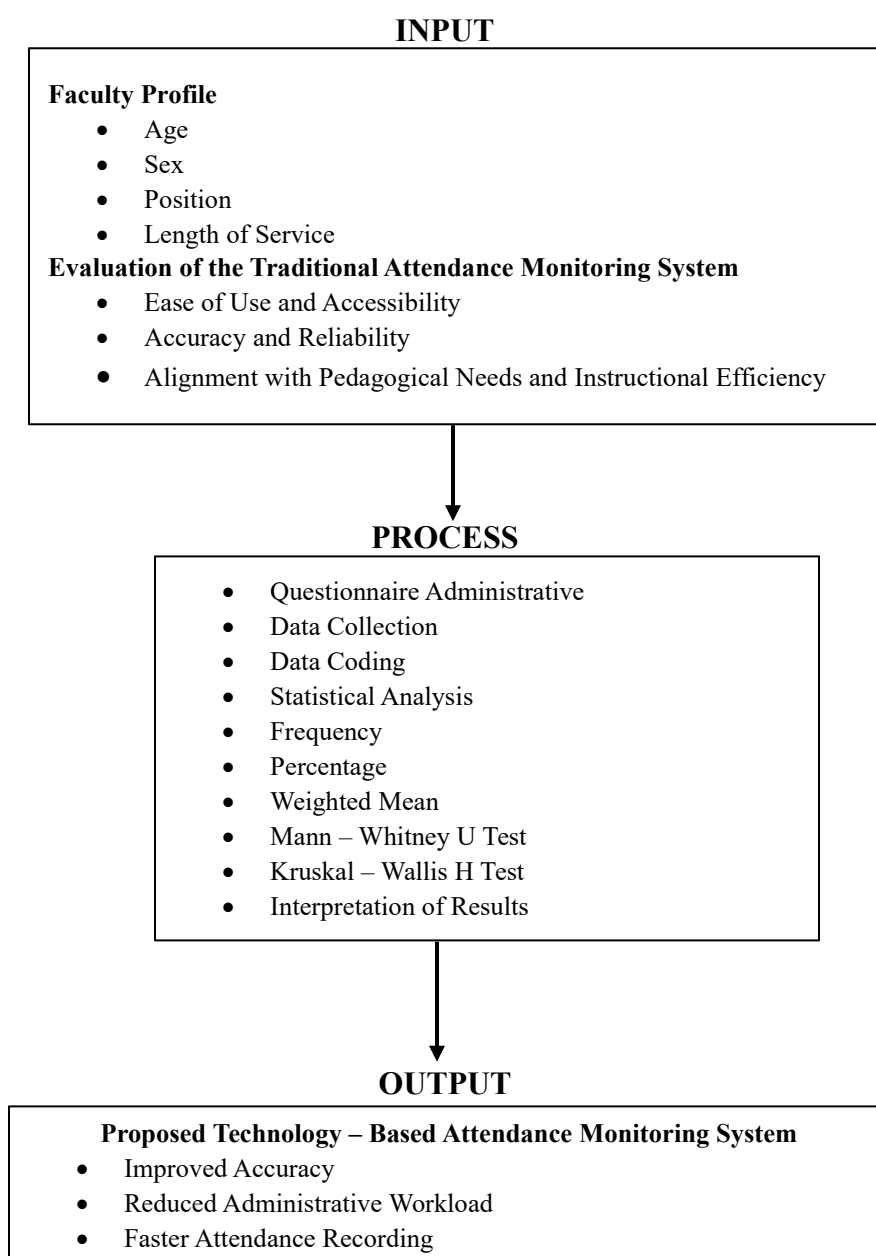


Figure 1 illustrates the conceptual framework of the study using the Input–Process–Output (IPO) Model. The input consists of the respondents' demographic profile, including age, sex, position, and length of service, together with their evaluation of the traditional attendance monitoring system in terms of ease of use and accessibility, accuracy and reliability in tracking attendance, and alignment with pedagogical needs and instructional efficiency.

The process involves administering a validated survey questionnaire, collecting and organizing the responses, and analyzing the data using appropriate descriptive and inferential statistical techniques. The findings are interpreted to determine the level of faculty satisfaction and identify areas requiring improvement.

The output is a proposed technology-based attendance monitoring system that addresses the limitations identified in the current manual attendance process. The proposed system is expected to improve attendance recording accuracy, reduce administrative workload, facilitate efficient data management, support instructional activities, and strengthen institutional decision-making while ensuring compliance with applicable data privacy regulations.

SCOPE AND DELIMITATIONS OF THE STUDY

This study focused on evaluating faculty satisfaction with the traditional attendance monitoring system currently implemented at Bohol Northern Star College (BNSC) during the Academic Year 2025–2026. Specifically, it examined faculty perceptions of the existing manual attendance monitoring process in terms of ease of use and accessibility, accuracy and reliability in tracking attendance, and alignment with pedagogical needs and instructional efficiency.

The respondents of the study consisted exclusively of teaching personnel who were directly responsible for recording and monitoring student attendance. Their responses provided firsthand information regarding the effectiveness and limitations of the institution's existing attendance monitoring practices. Faculty members who were not directly involved in attendance recording, non-teaching personnel, students, and other institutional stakeholders were excluded from the study.

The respondents' demographic profile was described according to age, sex, academic position, and length of service, and these variables were used to determine whether significant differences existed in faculty satisfaction with the traditional attendance monitoring system.

The study adopted a quantitative descriptive-comparative research design using a researcher-developed questionnaire as the primary data-gathering instrument. Descriptive statistics, including frequency, percentage, and weighted mean, were employed to summarize the respondents' profile and level of satisfaction. Inferential statistics, specifically the Mann–Whitney U Test and Kruskal–Wallis H Test, were utilized to determine whether significant differences existed among respondent groups based on the selected demographic variables.

The findings of this study are limited to the faculty members of Bohol Northern Star College and reflect their perceptions during the conduct of the study. Consequently, the results may not be

generalized to other higher education institutions with different organizational structures, attendance monitoring practices, technological infrastructures, or faculty demographics.

Furthermore, the study did not involve the design, development, implementation, or evaluation of a technology-based attendance monitoring system. Instead, it assessed the existing traditional attendance monitoring system and utilized the findings as the basis for proposing a technology-enhanced attendance monitoring solution. The study also relied on self-reported responses obtained through a survey questionnaire, which may be influenced by respondents' individual experiences, perceptions, and personal judgment despite efforts to ensure objectivity and confidentiality.

STATEMENT OF THE PROBLEM

The primary purpose of this study was to evaluate faculty satisfaction with the traditional attendance monitoring system implemented at Bohol Northern Star College during the Academic Year 2025–2026. Specifically, the study sought to determine whether the existing attendance monitoring system adequately supports instructional activities and institutional record management and to identify areas that may serve as the basis for developing a technology-based attendance monitoring system.

Specifically, this study sought to answer the following research questions:

1. What is the demographic profile of the respondents in terms of:
 - 1.1 Age;
 - 1.2 Sex;
 - 1.3 Academic Position; and
 - 1.4 Length of Service?
2. What is the level of faculty satisfaction with the traditional attendance monitoring system in terms of:
 - 2.1 Ease of Use and Accessibility;
 - 2.2 Accuracy and Reliability in Tracking Attendance; and
 - 2.3 Alignment with Pedagogical Needs and Instructional Efficiency?
3. Is there a significant difference in the level of faculty satisfaction with the traditional attendance monitoring system when respondents are grouped according to their:
 - 3.1 Age;

3.2 Sex;

3.3 Academic Position; and

3.4 Length of Service?

4. Based on the findings of the study, what technology-based attendance monitoring system may be proposed to improve attendance recording, data management, and instructional efficiency at Bohol Northern Star College?

Hypothesis

To guide the inferential analysis of the study, the following null hypothesis was formulated:

There is no significant difference in the level of faculty satisfaction with the traditional attendance monitoring system when respondents are grouped according to age, sex, academic position, and length of service.

OPERATIONAL DEFINITION OF TERMS

For clarity and consistency, the following terms are operationally defined as used in this study:

Attendance Monitoring System refers to the existing manual process employed by faculty members to record, monitor, and manage students' class attendance at Bohol Northern Star College.

Traditional Attendance Monitoring System refers to paper-based attendance recording methods such as roll calls, attendance sheets, written records, quizzes, and manual documentation currently practiced by faculty members.

Faculty Satisfaction refers to the degree to which faculty members perceive the traditional attendance monitoring system as effective, accurate, reliable, accessible, and supportive of instructional activities.

Ease of Use and Accessibility refers to the extent to which faculty members perceive the attendance monitoring system as simple to use, understandable, convenient, and readily available during classroom instruction.

Accuracy and Reliability refers to the ability of the attendance monitoring system to correctly record attendance information, minimize recording errors, and produce dependable attendance records.

Instructional Efficiency refers to the extent to which the attendance monitoring system supports classroom management, minimizes disruptions during instruction, and contributes to effective teaching practices.

Technology-Based Attendance Monitoring System refers to the proposed digital attendance recording system that utilizes modern information technology to improve attendance accuracy, automate record management, reduce administrative workload, and facilitate efficient retrieval of attendance data

REVIEW OF RELATED LITERATURE

Attendance monitoring is an integral component of educational management because it supports academic accountability, classroom management, and institutional record keeping. Attendance records enable instructors and administrators to monitor student participation, identify absenteeism patterns, and implement timely interventions that promote student success. Numerous studies have demonstrated a positive relationship between regular class attendance and academic performance, emphasizing that students who consistently attend classes are more likely to achieve better learning outcomes and complete their academic requirements successfully (Yahya & Anwar, 2013).

Beyond measuring student presence, attendance records serve as valuable institutional data used for academic reporting, student retention initiatives, and policy formulation. Consequently, higher education institutions are expected to maintain attendance monitoring systems that are accurate, reliable, and efficient. As educational environments become increasingly data-driven, institutions are challenged to modernize attendance management practices that support both instructional and administrative functions. For many years, educational institutions have relied on manual attendance monitoring methods such as roll calls, attendance sheets, sign-in logs, and written class records. These methods remain widely used because they require minimal technological infrastructure and involve relatively low implementation costs.

Despite these advantages, traditional attendance monitoring systems present several operational challenges. Manual attendance recording consumes instructional time, increases administrative workload, and is susceptible to recording errors, misplaced records, and attendance manipulation. Morse (2013) noted that manual attendance management becomes increasingly inefficient as class sizes grow and institutional reporting requirements become more complex. Likewise, paper-based attendance records often make information retrieval, verification, and long-term storage more difficult than digital alternatives. These limitations have prompted educational institutions to evaluate the effectiveness of traditional attendance systems and explore technological solutions that improve operational efficiency without compromising instructional quality.

Rapid developments in information and communication technologies have significantly transformed attendance management in educational institutions. Modern attendance monitoring systems automate attendance recording, improve data accuracy, and provide real-time access to attendance information. Biometric technologies identify individuals using unique physiological characteristics such as fingerprints, facial recognition, iris patterns, or palm vein scans. These systems reduce the possibility of proxy attendance and improve the authenticity of attendance records.

Kumar and Jain (2018) reported that fingerprint-based attendance systems significantly enhanced attendance accuracy while reducing administrative workload. Similarly, Liu et al. (2020) found

that biometric systems improved users' confidence in attendance records because identity verification relied on unique biological characteristics rather than manual confirmation. Although biometric technologies provide high levels of security and accuracy, implementation costs, maintenance requirements, and data privacy concerns remain important considerations for educational institutions.

Radio Frequency Identification (RFID) and Quick Response (QR) code technologies have become widely adopted alternatives to manual attendance monitoring because they provide fast, automated, and cost-effective attendance recording. RFID systems use electronic identification cards that communicate with RFID readers to record attendance automatically. Nayak et al. (2017) found that RFID technology significantly reduced attendance recording time while improving record accuracy and minimizing human error.

Similarly, QR code-based attendance systems allow students to register attendance by scanning unique QR codes using smartphones or institutional devices. Recent studies have shown that QR code systems reduce paperwork, simplify attendance recording, and improve administrative

The increasing availability of smartphones and cloud computing technologies has facilitated the development of mobile attendance monitoring systems that provide real-time data synchronization and centralized record management. Chiang et al. (2022) demonstrated that smartphone-based attendance systems integrating GPS and Near Field Communication (NFC) technologies improved attendance accuracy while allowing instructors to monitor attendance efficiently. Likewise, Chakraborty et al. (2019) emphasized that cloud-based attendance systems facilitate secure data storage, rapid information retrieval, and real-time report generation, thereby supporting institutional decision-making. These technologies also reduce dependence on paper records, simplify data management, and improve accessibility for authorized users.

Artificial intelligence (AI) has recently emerged as an important innovation in educational attendance management. AI-powered attendance systems can automate attendance verification, analyze attendance trends, detect irregular attendance patterns, and generate predictive reports that assist educators in identifying students at risk of absenteeism. Jaiswal and Sinha (2022) explained that AI-based attendance systems enhance institutional efficiency by reducing manual administrative tasks while supporting data-driven decision-making. The integration of AI with cloud computing and facial recognition technologies further strengthens the reliability and scalability of attendance monitoring systems in higher education. The successful implementation of educational technologies depends not only on technical capabilities but also on users' willingness to adopt new systems.

Conversely, technology-based attendance monitoring systems utilizing biometric authentication, RFID, QR codes, mobile applications, cloud computing, and artificial intelligence have been shown to improve attendance accuracy, reduce faculty workload, facilitate real-time reporting, and enhance institutional decision-making. The literature also emphasizes that successful technology adoption depends on user acceptance, organizational readiness, and compliance with data privacy regulations. Collectively, these studies support the need for educational institutions to evaluate existing attendance monitoring practices before implementing technological innovations.

METHODOLOGY

Research Design

This study employed a quantitative descriptive-comparative research design to evaluate faculty satisfaction with the traditional attendance monitoring system implemented at Bohol Northern Star College during the Academic Year 2025–2026.

The descriptive component was utilized to describe the demographic profile of the respondents and determine their level of satisfaction with the existing attendance monitoring system in terms of ease of use and accessibility, accuracy and reliability in tracking attendance, and alignment with pedagogical needs and instructional efficiency.

The comparative component determined whether significant differences existed in faculty satisfaction when respondents were grouped according to age, sex, academic position, and length of service. Since the data collected through a four-point Likert scale were ordinal and did not require the assumption of normal distribution, non-parametric statistical tests were employed.

This research design was deemed appropriate because it enabled the researchers to describe faculty perceptions of the current attendance monitoring system while statistically comparing responses among different demographic groups. The findings served as empirical evidence for proposing a technology-based attendance monitoring system that addresses the identified limitations of the existing manual process.

Research Environment

The study was conducted at Bohol Northern Star College (BNSC), a private higher education institution located in Ubay, Bohol, Philippines. The institution offers undergraduate programs in various disciplines, including Information Technology, Industrial Technology, Business Administration, Teacher Education, Criminology, Hospitality Management, and other academic programs.

At the time of the study, the institution employed a traditional manual attendance monitoring system in which faculty members recorded student attendance using paper-based attendance sheets, roll calls, written records, quizzes, and manual documentation during classroom instruction.

The selection of Bohol Northern Star College as the research locale was based on the institution's continued implementation of a traditional attendance monitoring process and its intention to

explore technology-driven innovations that could improve attendance management, instructional efficiency, and institutional record keeping.

Research Respondents

The respondents of the study consisted of thirty-six (36) faculty members currently employed at Bohol Northern Star College during the Academic Year 2025–2026.

Only faculty members who were directly responsible for recording student attendance during classroom instruction were included in the study. Their experiences and perceptions provided reliable information regarding the effectiveness, strengths, and limitations of the institution's traditional attendance monitoring system.

Faculty members who were on leave during the conduct of the study, newly hired personnel who had not yet handled attendance recording, administrative personnel, and non-teaching employees were excluded from the study because they were not directly involved in the attendance monitoring process.

Sampling Technique

The study employed purposive sampling; a non-probability sampling technique commonly used when respondents possess specific characteristics relevant to the objectives of the study.

Faculty members were selected based on the following inclusion criteria:

- currently employed as teaching personnel at Bohol Northern Star College;
- directly responsible for recording student attendance during classroom instruction;
- actively teaching during the Academic Year 2025–2026; and
- willing to participate voluntarily in the study.

Purposive sampling ensured that only respondents with firsthand experience using the institution's traditional attendance monitoring system participated in the survey, thereby increasing the relevance and reliability of the collected data.

Research Instrument

The researchers utilized a researcher-developed questionnaire as the primary instrument for data collection.

The questionnaire consisted of two major parts:

Part I: gathered the demographic profile of the respondents, including:

- Age
- Sex
- Academic Position
- Length of Service

Part II: assessed faculty satisfaction with the traditional attendance monitoring system using three evaluation dimensions:

- Ease of Use and Accessibility
- Accuracy and Reliability in Tracking Attendance
- Alignment with Pedagogical Needs and Instructional Efficiency

The instrument employed a four-point Likert scale to eliminate neutral responses and encourage respondents to express a clear perception regarding each statement.

Scale	Descriptive Rating	Interpretation
4	Strongly Agree	Very High Satisfaction
3	Agree	High Satisfaction
2	Disagree	Low Satisfaction
1	Strongly Disagree	Very Low Satisfaction

The questionnaire items were developed after an extensive review of related literature and existing attendance monitoring studies.

Validity and Reliability of the Instrument

To establish content validity, the questionnaire was evaluated by experts in educational research, information technology, and instructional management. Their comments and recommendations were incorporated into the final version of the instrument to improve clarity, relevance, organization, and alignment with the objectives of the study.

Prior to the actual data collection, a pilot test was conducted among faculty members who possessed characteristics similar to the target respondents but were not included in the final sample.

The internal consistency of the questionnaire was measured using Cronbach's Alpha. An acceptable reliability coefficient of 0.70 or higher indicated that the instrument possessed satisfactory reliability for measuring faculty satisfaction with the traditional attendance monitoring system.

Data Gathering Procedure

The researchers followed systematic procedures in collecting the data.

First, a formal letter requesting permission to conduct the study was submitted to the Office of the College President through the appropriate academic authorities. Upon approval, coordination with department chairpersons was undertaken to facilitate the distribution of questionnaires.

Before participation, respondents were informed about the purpose of the study, confidentiality of their responses, voluntary nature of participation, and their right to withdraw at any stage without penalty. Written informed consent was obtained from all participants.

The questionnaires were personally distributed to qualified faculty members. Respondents were given sufficient time to answer all items independently. Completed questionnaires were immediately collected, checked for completeness, and encoded into Microsoft Excel before being transferred to the Statistical Package for the Social Sciences (SPSS) for statistical analysis.

After data processing, the results were interpreted according to the research objectives and served as the basis for the proposed technology-based attendance monitoring system.

Statistical Treatment of Data

The following statistical tools were employed in analyzing the collected data.

Frequency and Percentage

Frequency counts and percentages were used to describe the demographic profile of the respondents according to age, sex, academic position, and length of service.

Weighted Mean

The weighted mean was utilized to determine the level of faculty satisfaction with the traditional attendance monitoring system across the three evaluation dimensions.

The weighted mean was computed using the following formula:

$$\bar{X} = \frac{\sum fX}{N}$$

where:

$\bar{X}$ = Weighted Mean

f = Frequency

X = Assigned Weight

N = Total Number of Responses

The following verbal interpretation was adopted:

Mean Range	Interpretation
3.26–4.00	Strongly Agree
2.51–3.25	Agree
1.76–2.50	Disagree
1.00–1.75	Strongly Disagree

Mann–Whitney U Test

The Mann–Whitney U Test was used to determine whether significant differences existed in faculty satisfaction when respondents were grouped according to sex, since only two independent groups were involved.

Kruskal–Wallis H Test

The Kruskal–Wallis H Test was employed to determine significant differences in faculty satisfaction according to age, academic position, and length of service, which involved more than two independent groups.

All hypotheses were tested at a 0.05 level of significance.

ETHICAL CONSIDERATIONS

The study follows ethical principles of respect, beneficence, and justice. Ethical clearance is obtained from the Recoletos Ethics Review Office. Participation is voluntary, with informed consent required. Data are anonymized, confidential, and used solely for academic purposes. Participants will be provided with an informed consent form explaining the study's purpose, procedures, risks, benefits, and voluntary nature of participation, with assurance that they may withdraw at any time without penalty. Faculty members will be recruited through coordination with department heads, and only those directly involved in attendance monitoring at Bohol Northern Star College will be included, ensuring relevance to the study, with no incentives or compensation provided. The study presents minimal risk, allows participants to skip questions or withdraw freely, and ensures that no personal identifiers are collected, with all data anonymized, coded, and securely stored in encrypted files accessible only to the researchers, and retained for three years before proper disposal through deletion of digital files and shredding of physical documents. Participants are not considered vulnerable, as they are professional faculty members capable of informed decision-making, and while there are no direct benefits, the study may help improve attendance systems, reduce administrative workload, and enhance institutional efficiency. After data collection, participants will be debriefed regarding the study's purpose and may request results, and the researchers declare no conflicts of interest while being trained students under the supervision of qualified faculty from the College Technology at Bohol Northern Star College.

RESULTS

Figure 2: Demographic profile of Bohol Northern Star College Faculty

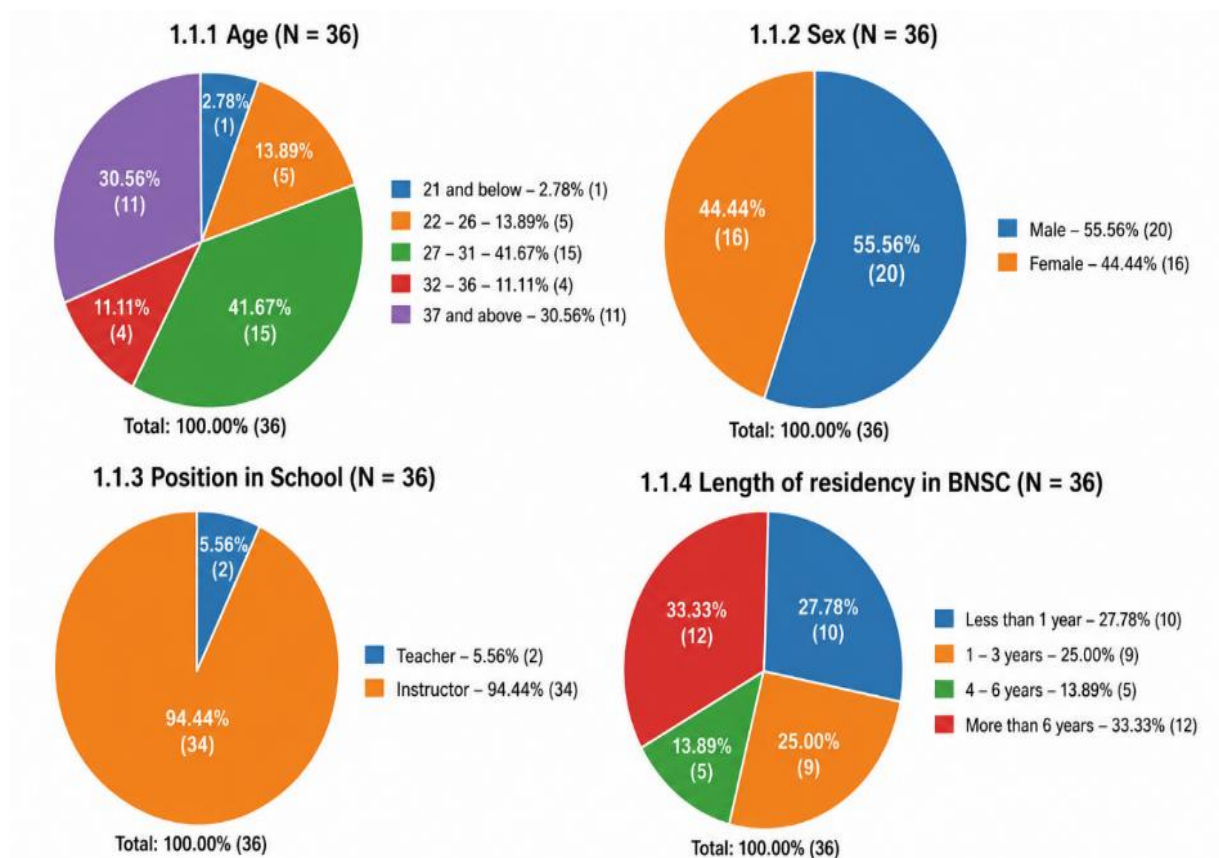


Figure 2 shows the demographic profile of Bohol Northern Star College Faculty, including age, gender, and length of service. Overall, the responders reflect a diversified yet somewhat experienced workforce, offering a sound basis for examining the institution's attendance tracking policies.

Figure 3: Faculty Evaluation of the Manual Attendance System

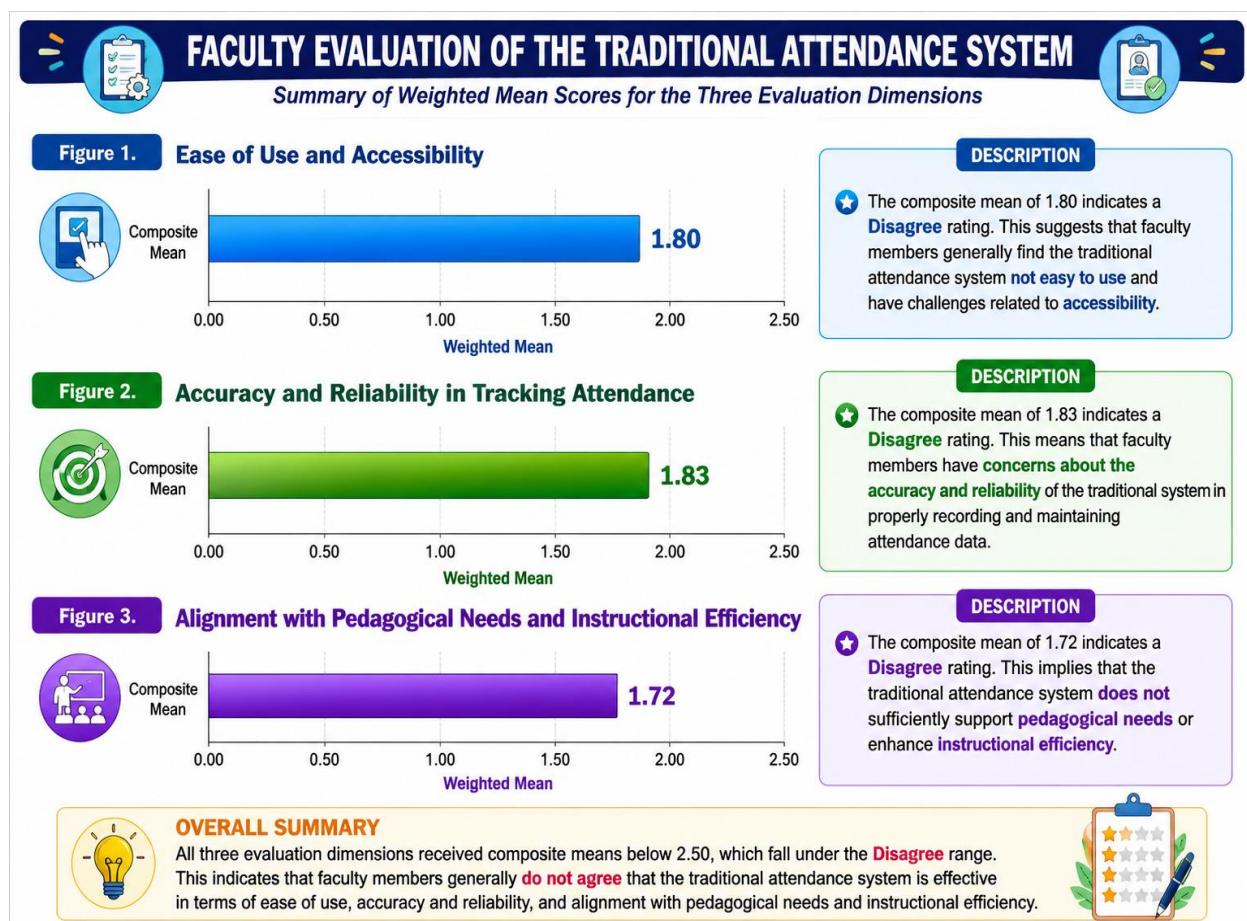


Figure 3 presents the composite mean scores of the faculty evaluation of the traditional attendance system across the three evaluation dimensions. All dimensions obtained composite mean scores within the "Disagree" category, indicating an unfavorable perception of the system. Accuracy and Reliability in Tracking Attendance obtained the highest composite mean ($M = 1.83$), followed by Ease of Use and Accessibility ($M = 1.80$). Alignment with Pedagogical Needs and Instructional Efficiency received the lowest composite mean ($M = 1.72$), suggesting that the traditional attendance system is least effective in supporting instructional and pedagogical requirements. Overall, the findings indicate that faculty

members generally perceive the traditional attendance system as ineffective in terms of usability, reliability, and alignment with instructional needs.

Figure 4: Faculty Evaluation by sex across dimensions

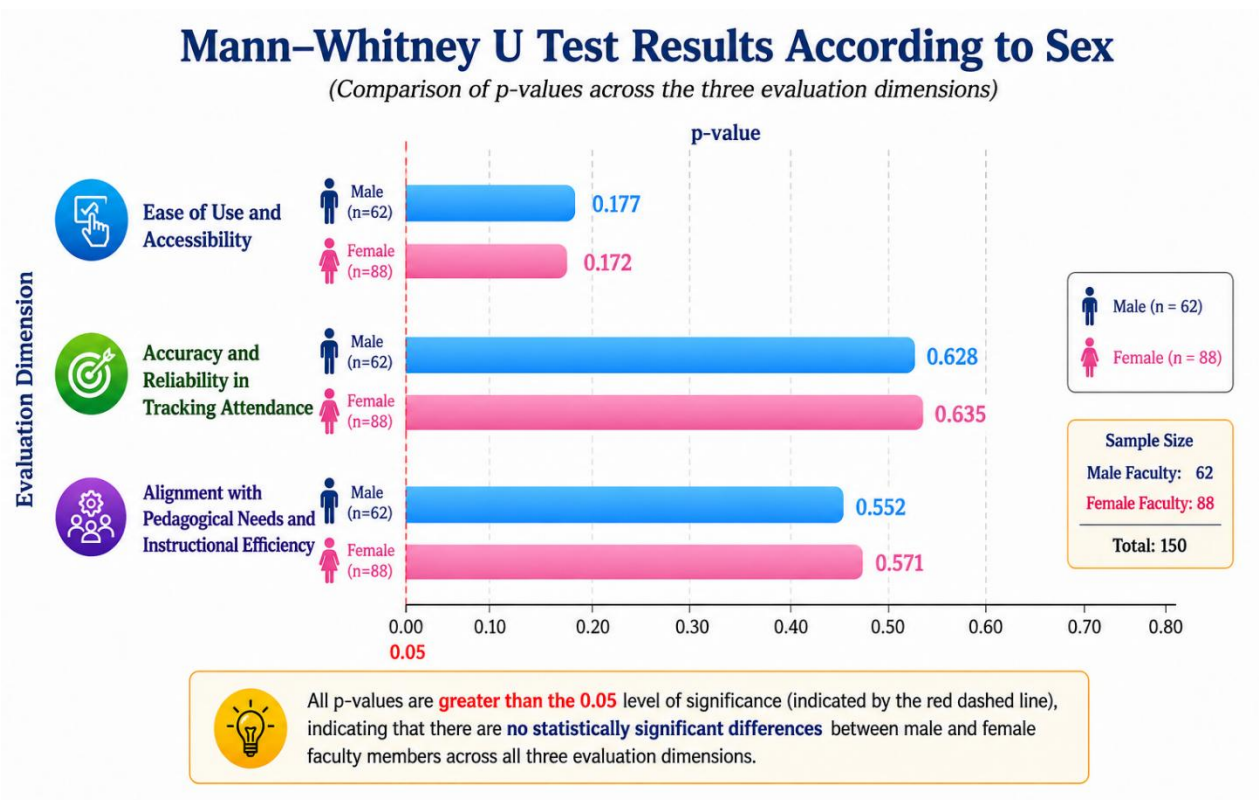


Figure 4 shows A Mann–Whitney U test was conducted to determine whether faculty members' evaluations of the attendance monitoring system differed based on sex. The results revealed no statistically significant differences between male and female faculty members across all three evaluation dimensions. Specifically, no significant differences were found in Ease of Use and Accessibility ($p = .174$), Accuracy and Reliability in Tracking Attendance ($p = .631$), and Alignment with Pedagogical Needs and Instructional Efficiency ($p = .563$), as all *p*-values were greater than the 0.05 level of significance. Although there were slight variations in the responses of male and female faculty members, these differences were not statistically significant. These findings indicate that faculty members, regardless of sex, share similar perceptions and evaluations of the attendance monitoring system across all measured dimensions.

Figure 5: Faculty Evaluation mean rank by Age

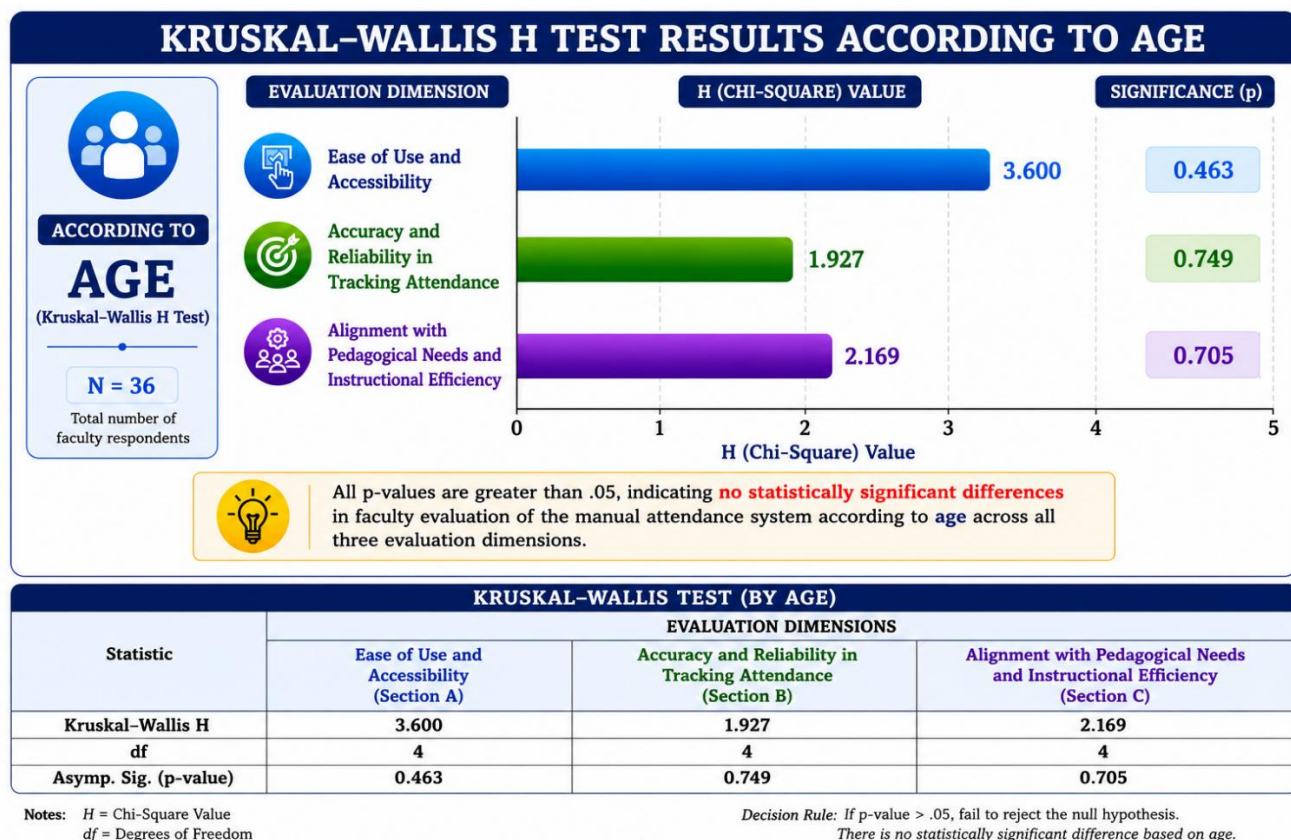


Figure 5 presents the Kruskal–Wallis H test results of faculty evaluations of the manual attendance system across different age groups in terms of Ease of Use and Accessibility, Accuracy and Reliability in Tracking Attendance, and Alignment with Pedagogical Needs and Instructional Efficiency. The results show that all p-values were greater than the 0.05 level of significance (Ease of Use and Accessibility: $H = 3.600$, $p = .463$; Accuracy and Reliability in Tracking Attendance: $H = 1.927$, $p = .749$; Alignment with Pedagogical Needs and Instructional Efficiency: $H = 2.169$, $p = .705$), indicating no statistically significant differences among the different age groups. Although the mean rank scores varied slightly across age categories, these differences were not statistically significant. These findings suggest that faculty members, regardless of age, have comparable evaluations of the manual attendance system, indicating that

age does not significantly influence their perceptions of its ease of use, accuracy in tracking attendance, or alignment with pedagogical needs and instructional efficiency.

Figure 6: Faculty Evaluation mean rank by Position

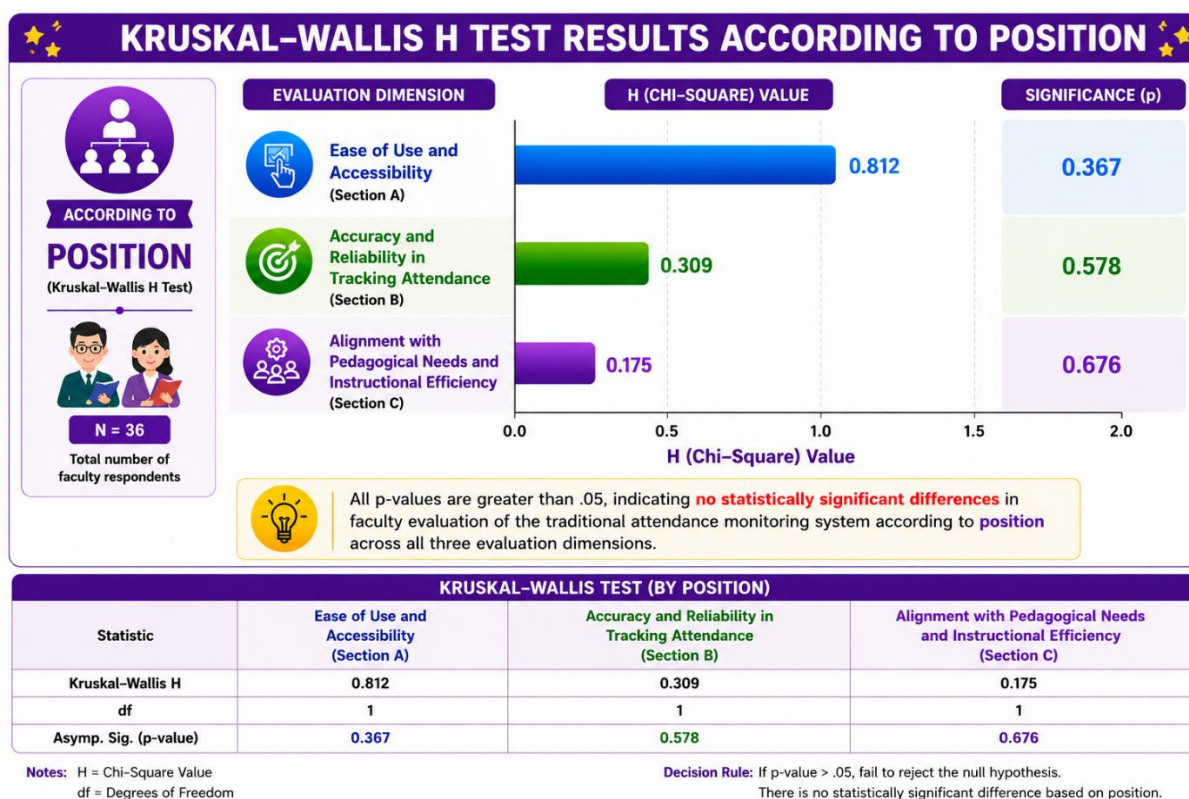


Figure 6 presents the Kruskal–Wallis H test results of faculty evaluations of the manual attendance system according to position (Teacher and Instructor) in terms of Ease of Use and Accessibility, Accuracy and Reliability in Tracking Attendance, and Alignment with Pedagogical Needs and Instructional Efficiency. The results show that all p-values were greater than the 0.05 level of significance (Ease of Use and Accessibility: $H = 0.812$, $p = .367$; Accuracy and Reliability in Tracking Attendance: $H = 0.309$, $p = .578$; Alignment with Pedagogical Needs and Instructional Efficiency: $H = 0.175$, $p = .676$), indicating no statistically significant differences between teachers and instructors across all three evaluation dimensions.

These findings suggest that faculty members' position does not significantly influence their evaluations of the manual attendance system. Both teachers and instructors generally share

comparable perceptions of the system's ease of use, accuracy and reliability in tracking attendance, and alignment with pedagogical needs and instructional efficiency.

Figure 7: Faculty Evaluation mean rank by Position

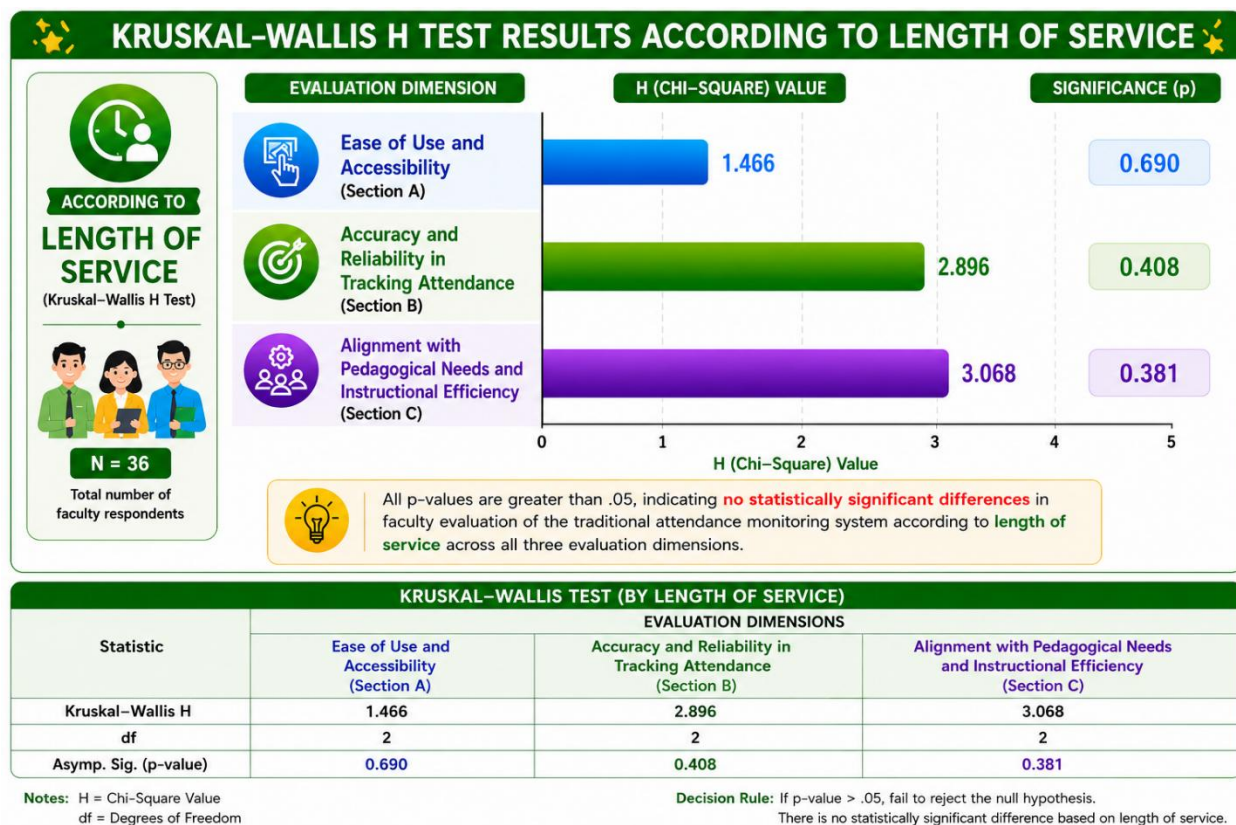


Figure 7 presents the Kruskal–Wallis H test results of faculty evaluations of the manual attendance system according to length of service in terms of Ease of Use and Accessibility, Accuracy and Reliability in Tracking Attendance, and Alignment with Pedagogical Needs and Instructional Efficiency. The results show that all p-values were greater than the 0.05 level of significance (Ease of Use and Accessibility: $H = 1.466$, $p = .690$; Accuracy and Reliability in Tracking Attendance: $H = 2.896$, $p = .408$; Alignment with Pedagogical Needs and Instructional Efficiency: $H = 3.068$, $p = .381$), indicating no statistically significant differences among faculty members with varying lengths of service.

These findings indicate that length of service does not significantly influence faculty members' evaluations of the manual attendance system. Regardless of their years of teaching experience, faculty members generally reported comparable perceptions of the system's ease of use, accuracy and reliability in tracking attendance, and alignment with pedagogical needs and instructional efficiency.

CONCLUSION

This study evaluated faculty perceptions of the traditional attendance monitoring system implemented at Bohol Northern Star College during the Academic Year 2025–2026. The findings revealed that faculty members generally expressed unfavorable evaluations of the existing manual attendance monitoring system. Specifically, the system received composite mean scores within the Disagree category in terms of Ease of Use and Accessibility, Accuracy and Reliability in Tracking Attendance, and Alignment with Pedagogical Needs and Instructional Efficiency. These findings indicate that the current manual attendance monitoring process does not adequately support efficient attendance recording, reliable documentation, or effective instructional management.

The results suggest that while the traditional attendance monitoring system has been utilized for routine classroom attendance, it no longer sufficiently addresses the operational and instructional demands of a modern higher education institution. Faculty members perceived limitations associated with the manual process, including inefficiencies in attendance recording, increased administrative workload, and challenges in maintaining accurate and accessible attendance records. These findings reinforce the growing need for educational institutions to adopt technology-enhanced administrative practices that improve operational efficiency while supporting effective teaching and learning.

Furthermore, inferential statistical analyses revealed no statistically significant differences in faculty evaluations when respondents were grouped according to age, sex, academic position, and length of service. This indicates that faculty perceptions of the traditional attendance monitoring system were generally consistent regardless of demographic characteristics. The absence of significant differences suggests that the identified concerns are institutional rather than demographic, indicating a shared recognition among faculty members of the need for improvements in attendance management.

Overall, the findings support the development and implementation of a technology-based attendance monitoring system that enhances accessibility, improves the accuracy and reliability of attendance records, reduces administrative workload, and strengthens instructional efficiency. Such a system should be designed with consideration for user needs, institutional requirements, and compliance with the Data Privacy Act of 2012 (Republic Act No. 10173). The study provides empirical evidence that may assist educational administrators and decision-makers in

planning digital transformation initiatives that improve attendance management and contribute to more effective educational service delivery.

RECOMMENDATIONS

Based on the findings and conclusions of the study, the following recommendations are proposed:

1. School Administration

The administration of Bohol Northern Star College should prioritize the development and implementation of a technology-based attendance monitoring system to replace the existing manual process. The proposed system should improve attendance recording accuracy, reduce faculty workload, facilitate efficient record retrieval, and generate real-time attendance reports that support institutional planning and decision-making. Adequate financial resources, technological infrastructure, and technical support should be allocated to ensure successful implementation and long-term sustainability.

2. Faculty Members

Faculty members are encouraged to actively participate in the planning, pilot testing, implementation, and evaluation of the proposed attendance monitoring system. Continuous professional development and training should be provided to strengthen digital competencies and ensure that instructors can effectively utilize the new system. Faculty feedback should also be regularly collected to support continuous system improvement.

3. Information Technology Personnel and System Developers

The Information Technology Office and system developers should design a secure, reliable, and user-friendly attendance monitoring system that aligns with institutional needs and faculty requirements. The system should incorporate features such as automated attendance recording, real-time reporting, centralized database management, user authentication, audit trails, and secure data storage. Compliance with the Data Privacy Act of 2012 (Republic Act No. 10173) should be ensured through appropriate technical and organizational safeguards.

4. Institutional Policymakers

Institutional administrators should formulate policies and standard operating procedures governing the implementation, use, maintenance, monitoring, and periodic evaluation of the attendance monitoring system. Regular system assessment should be conducted to ensure that the technology continues to meet instructional, administrative, and institutional requirements while adapting to emerging technological developments.

5. Future Researchers

Future researchers are encouraged to extend this study by involving a larger and more diverse sample from multiple higher education institutions to improve the generalizability of the findings. Comparative studies between manual and technology-based attendance monitoring systems may

provide additional insights into their effectiveness and user acceptance. Researchers may also investigate factors such as system usability, user satisfaction, data security, implementation cost, organizational readiness, and the impact of digital attendance monitoring on faculty productivity, student engagement, and institutional performance. Moreover, future studies may evaluate the effectiveness of the proposed attendance monitoring system after its implementation using established technology acceptance and system success models.

PROPOSAL/PLAN

SMARTTRACK BNSC: RFID-BASED ATTENDANCE MONITORING SYSTEM

Program Rationale

The findings of the study entitled "Faculty Evaluation of the Traditional Attendance Monitoring System: Basis for the Development of a Technology-Based Attendance Monitoring System" revealed that faculty members generally expressed dissatisfaction with the existing manual attendance monitoring process.

The study obtained the following composite mean scores:

Evaluation Dimension	Composite Mean	Interpretation
Ease of Use and Accessibility	1.80	Disagree
Accuracy and Reliability	1.83	Disagree
Alignment with Pedagogical Needs and Instructional Efficiency	1.72	Disagree

These findings indicate that the current manual attendance monitoring system does not adequately support efficient attendance recording, reliable documentation, or effective classroom management. Moreover, faculty evaluations were consistent regardless of age, sex, academic position, and length of service, suggesting that the need for improvement is institution-wide rather than limited to a particular group.

To address these concerns, this proposal recommends the development and implementation of a Technology-Based Attendance Monitoring System that will modernize attendance management while improving efficiency, accuracy, accessibility, and institutional reporting.

General Objective

To improve attendance monitoring at Bohol Northern Star College through the implementation of a secure, efficient, and technology-based attendance monitoring system.

Specific Objectives

The proposed system aims to:

- 1. Automate attendance recording.
- 2. Minimize human error in attendance documentation.
- 3. Reduce faculty workload during attendance checking.
- 4. Generate real-time attendance reports.
- 5. Improve attendance record accuracy.
- 6. Provide centralized attendance data storage.
- 7. Support faster report generation.
- 8. Ensure compliance with the Data Privacy Act of 2012.
- 9. Improve instructional efficiency.
- 10. Provide administrators with attendance analytics for decision-making.

Target Beneficiaries

- 1. Faculty members (Teachers and Instructors)
- 2. Students of Bohol Northern Star College
- 3. Academic administrators and support staff

Program Description

The SmartTrack BNSC Program utilizes RFID cards issued to students, which are scanned upon entering the classroom. Attendance data are automatically recorded in a centralized digital database accessible to authorized faculty and administrators. The system is designed to be simple, user-friendly, and compliant with institutional policies and the Data Privacy Act of 2012. Faculty members will undergo orientation and brief hands-on training to ensure proper and consistent system use. Initial implementation will include pilot testing, followed by full institution-wide adoption upon evaluation.

Key Activities and Implementation Plan

Activity	Responsible Persons	Expected Output
Planning and policy formulation	School Administration, IT Department	Approved program plan
Faculty orientation and training	IT Department	Trained faculty users
RFID card issuance and system setup	Registrar, IT Department	Operational RFID system
Pilot testing and monitoring	Faculty, IT Department	Tested and refined system
Full implementation and evaluation	Administration, IT Department	Improved attendance monitoring

Implementation Timeline

The program shall be implemented over one academic term, beginning with planning and training, followed by pilot testing and full deployment. Continuous monitoring and evaluation will be conducted to ensure system effectiveness and sustainability.

Expected Outcomes

1. Improved accuracy and reliability of attendance records
2. Reduced instructional time spent on attendance checking
3. Lower incidence of attendance manipulation
4. More efficient retrieval of attendance data
5. Enhanced institutional decision-making and reporting

Sustainability and Evaluation

To ensure sustainability, the system will be periodically evaluated through faculty feedback and attendance data analysis. Technical support and system updates will be provided by the IT Department. Continuous training and system refinement will support long-term effectiveness.

Conclusion

Aligned with the findings and recommendations of this study, the SmartTrack BNSC Program offers a practical and evidence-based solution to improve attendance monitoring at Bohol Northern Star College. By integrating RFID technology, the program addresses the limitations of the traditional system while maintaining its strengths, ultimately supporting instructional efficiency, data accuracy, and institutional accountability.

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