

# ENHANCEMENT OF STUDENT ATTENDANCE MONITORING THROUGH A MOBILE APPLICATION

**Ojuawo, O. O. and Arowolo, P. O**

DEPARTMENT OF COMPUTER SCIENCE, THE FEDERAL POLYTECHNIC, P.M.B. 50,  
ILARO, OGUN STATE, NIGERIA

EMAIL: [olutayo.ojuawo@federalpolyilaro.edu.ng](mailto:olutayo.ojuawo@federalpolyilaro.edu.ng)  
[paul.arowolo@federalpolyilaro.edu.ng](mailto:paul.arowolo@federalpolyilaro.edu.ng)

PHONE NO: 08038417080  
08068584858

## ABSTRACT

*From ages past, managing the attendance using a traditional approach is really a cumbersome process. Marking or taking of attendance has been one of the best ways to keep records and tracks of students in schools, colleges, and the likes. The most widely known method of taking students attendance in higher institutions today is the manual method in which students put down their names and matriculation numbers on a sheet of paper and at the end of each lecture, the lecturer calls the students names or student's identification number (matriculation number). The case study for this research, The Federal Polytechnic Ilaro, operates on the manual way of taking students' attendance. This old system requires students to put down their names and matriculation numbers on a sheet of paper at every lecture. These papers are then submitted to the lecturer in charge on a weekly basis. It was observed that most lecturers do misplace the attendance list submitted by the students. The main aim of this paper is to develop a mobile-based application to reduce the time spent on manual operations, curb loosing of attendance records and curb manipulation of attendance records. This system is designed only to be operated or used by the lecturer (user), the system will accept input of course data such as course code and course title, also accept student data like student name and student matriculation number. We also sampled the lecturers' opinion, via administering the questionnaire, on the existing way taking attendance in class and the new system to be developed. Furthermore, we utilized SPSS to analyze the questionnaire.*

Keywords: Attendance record system, identification number, mobile application, SPSS

## **I. INTRODUCTION**

As the world of technology is advancing and growing, people are much in high demand of applications already in existence on paper-based or desktop platform to be available on portable devices like mobile phones, tablets etc. The manual method of taking attendance is becoming obsolete and more tasking. Attendance can be taken on our Android mobile devices as it is portable to take along at any point in time and it is easy to operate.

In the current scenario, management and maintenance of student information is a cumbersome task for any institution. The student's academic information consists of monitoring their performance and progress periodically which seems to be a huge workload on lecturers to handle an update on the progress of subjects for the respective classes. The traditional way of attendance is, recording manually in a log book or making use of a sheet of paper and then converting into a desktop application. Such a system can be a tedious process and may often lead to errors while generation reports. Apart from this, sometimes the attendance sheets are lost, misplaced or information wrongly entered due to various reasons. In order to reduce the manual work and to achieve more efficiency in managing student's information, a smartphone-based mobile application using Android can be applied to make this process more easy and beneficial in every way (Chawhan, Girhale, and Mankar, 2013).

Nowadays, attendance is generally taken on the pieces of paper. Using mobile for taking attendance, consumes not only less energy but also helps in reducing the wastage of paper and can serve as a greenway for taking the attendance. Use of paper nowadays can be eliminated by the use of mobile or automating the process of attendance. In the most case at the higher institution, attendance monitoring constitutes to students' continuous assessment test (CA test) and there is always needs to monitor it thoroughly. The paper main objective is to develop and designs the android – based mobile attendance application for the monitoring of attendance records in the educational organization using Federal Polytechnic Ilaro as the case study.

## **II. OVERVIEW OF THE STUDENT ATTENDANCE MONITORING**

In the past taking attendance in schools and colleges has been something that is open to the tendency of losing students attendance data and also give room for manipulation which can be done by student such that a student register for another student who is absent for a particular class or lecture.

Therefore this attendance system has been introduced and designed as an offline application such that student attendance can be managed offline diligently and efficiently on an android platform which makes the mobility of the application easy.

This system is designed mainly for lecturer, the lecturer will launch the application by clicking on it, then proceed to add courses or subjects, then click on the subject added to add students who with each student's name and identity number (Matric Number) that offer the course, when add student button is clicked on, the student details are automatically saved into the database then the students added can be viewed, then the lecturer can then take attendance of the, save attendance taken and also generate report.

With this android application student attendance, data can be generated in both soft copy and hard copy at any point in time.

## **III. RELATED WORK ON STUDENT ATTENDANCE MONITORING**

Different methods and principles have been applied to effectively monitor the attendance of the students. A system providing an improvised electronic card and card reader serially interfaced to the digital computer system was proposed, which is an embedded computer based attendance management system (Shoewu, Olaniyi, and Lawson, 2011). A wireless attendance management system used the iris of the individual for authentication (Kadry, and Smaili, 2010). All processes like capturing the image of iris recognition, extracting minutiae, storing and matching used an off-line iris recognition management system.

Authentication of the individuals for attendance management has also been carried out with the help of passwords. A system that uses passwords for authentication was designed and implemented (Cheng, Xiang, Hirota, and Ushijimaa, 2005), but, this type of system allows for

impersonation since the password can be shared or tampered with. Passwords can be forgotten at times thereby preventing the user from accessing the system.

Attendance monitoring systems are also developed using the biometric system as a mode of authentication and marking the attendance of the students. Authors in (Shoewu, and Idowu, 2012) designed and implemented a system that uses fingerprints to mark the attendance and generate the reports at the end of the semester. RFID system has also been used to develop an attendance and monitoring system. RFID system basically consists of two components: the first one consists of tags and readers, and the second is a computer software or application. The main function of the reader is to provide the means of communicating with the tags and enabling data transfer. The two forms used for establishing communication between hardware and software are: Start Listening and Stop Listening. Each time the system receives a request from the hardware, it connects to the database using an SQL connection, checks the data to verify whether or not an access granted. At the same time, the application stores all log info in order to provide later on monitoring while the user has the opportunity to track all the requests. All this is done based on detailed queries created within the application during the development phase (Kassem, Hamad, Chalhoub, and El Dahdaah, 2010).

#### **IV. METHODOLOGY OF THE DESIGNED SYSTEM**

This system is designed to substitute the manual system thereby enhancing its efficiency and accuracy. A sort of data secure guaranteed by the new system designed that is more effective than that of the manual system is highly achieved. It starts with an access method, which allows the user (e.g lecturer) to go access students list and take attendance on an android mobile; this is done by using the button options. Thus, provides quick access to the different data area of the application.

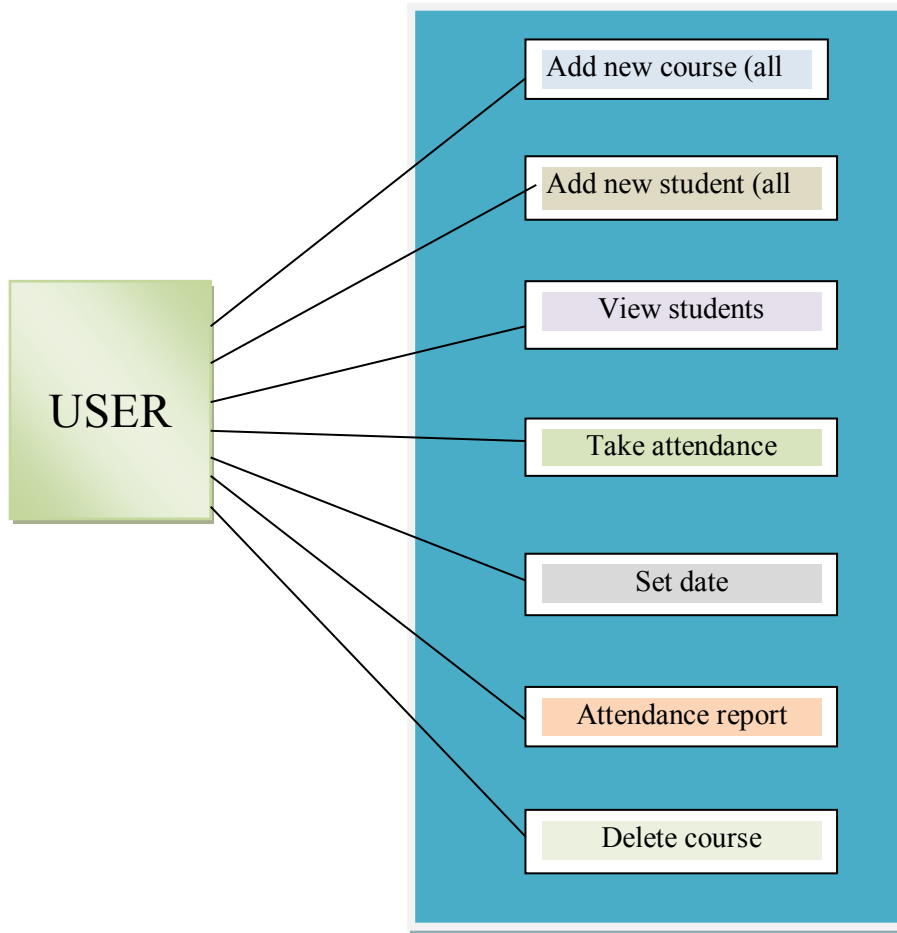


Figure 1: Overview of the application

**Add New Course:** this module allows the user to add courses or subject he or she takes for all classes.

**Add New Students:** details of all the students in each class who offer a particular course is added with this module.

**View Students:** this module has made it possible for the user to view all the students added which will show the student name and matric number as exactly typed in or added.

**Take Attendance:** the main function of this application is carried out on this module which is taking or marking of attendance, the user will see the list of all students for a particular course and a checkbox is provided which is marked when clicked on then after taking the attendance the user click on save button provided.

**Set Date:** with this module, the user will have a date pop-up which will allow the user to set date.

**Attendance Report:** the report of the attendance taken is generated when the button is clicked on.

**Delete course:** this module makes it possible for the user to delete a particular course which will include the student's details added under the course.

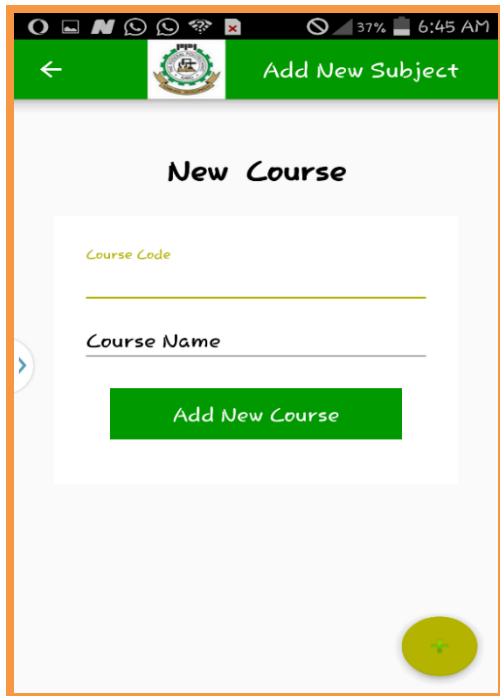


Figure 2: Add new course page

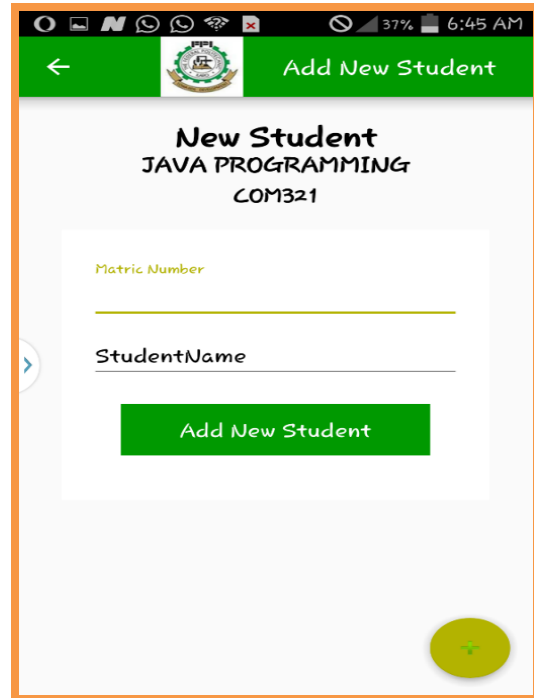


Figure 3: Add new student

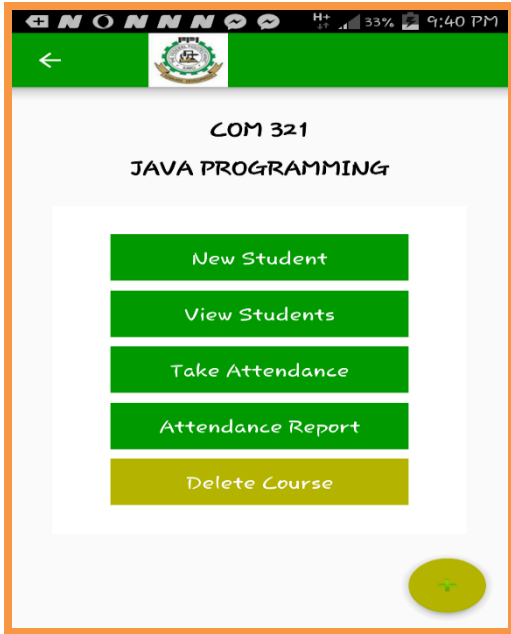


Figure 4: Application options page



Figure 5: View added student page



Figure 6 and 7: take attendance option then save pages

## V. PRESENTATION, ANALYSIS, AND INTERPRETATION OF DATA

This part deals with the analysis and findings of the data collected during the field survey. The objective of this study has been to develop and designs the android – based mobile attendance application for the monitoring of attendance records in the educational organization using Federal Polytechnic Ilaro as the case study. Questionnaires were given out to lecturers. Findings are been analyzed with the use of the Statistical Package for Social Science (SPSS) based on the fact gotten from the respondents, noting its interaction with the objectives of the study. Analysis of the data is as important as any other component of the research process.

A total of seventy-five questionnaires were administered to the respondents (some academic staff) and seventy-five were filled and returned.

**Table 1: Gender distribution of the respondents**

	Frequency	Percent	Valid Percent	Cumulative Percent
Female	30	40.0	40.0	40.0
Valid Male	45	60.0	60.0	100.0
Total	75	100.0	100.0	

*Source: Field Survey (SPSS), November 2018.*

Table 1 above shows the distribution by gender of the respondents. It is seen that out of the 75 respondents used for the survey work, 45 of them are male representing 60% of the respondents and the remaining 30 respondents representing 40% of the respondents are female.

**Table 2: Age distribution of the respondents**

	Frequency	Percent	Valid Percent	Cumulative Percent
21-25	9	12.0	12.0	12.0
26-30	19	25.3	25.3	37.3
Valid 31-35	22	29.3	29.3	66.7
36-40	14	18.7	18.7	85.3
41-Above	11	14.7	14.7	100.0
Total	75	100.0	100.0	

*Source: Field Survey (SPSS), November 2018.*



Table 2 shows the distribution of the respondents according to their various ages. 9 of the respondents representing 12% of the respondents are between 21 - 25 years of age, 19 of the respondents representing 25.3% are between 26 to 30 years of age, 22 are between 31 to 35 years of age representing 29.3% of the respondents, 14 are within 36 to 40 years of age representing 18.7% of the respondents, and the remaining 11 representing 14.7% are above 40 years of age.

**Table 3: Cadre distribution of the respondents**

	Frequency	Percent	Valid Percent	Cumulative Percent
Technologist	17	22.7	22.7	22.7
Assistance. Lecturer	25	33.3	33.3	56.0
Lecturer ( I-III)	16	21.3	21.3	77.3
Valid Senior Lecturer	11	14.7	14.7	92.0
Principal Lecturer	3	4.0	4.0	96.0
Chief Lecturer	3	4.0	4.0	100.0
Total	75	100.0	100.0	

*Source: Field Survey (SPSS), November 2018.*

Table 3 shows the distribution of the respondents according to their various cadres. 17 of the respondents representing 22.7% of the respondents are Technologist, 25 of the respondents representing 33.3% are Assistance Lecturers, 16 are between Lecturers I to III representing 21.3% of the respondents, 11 are Senior Lecturers representing 14.7% of the respondents, 3 of the respondents are Principal Lecturers representing 4.0% and the remaining 3 representing 4.0% are Chief Lecturers.

**Table 4: Do you usually collect attendance in class?**

	Frequency	Percent	Valid Percent	Cumulative Percent
No	11	14.7	14.7	14.7
Valid Yes	64	85.3	85.3	100.0
Total	75	100.0	100.0	

*Source: Field Survey (SPSS), November 2018.*

Table 4 shows that 11 representing 14.7% of the respondents do not usually collect attendance in the class while the remaining 64 respondents representing 85.3% do collect attendance in the class.

**Table 5: Do you have awareness of any mobile application?**

	Frequency	Percent	Valid Percent	Cumulative Percent
No	27	36.0	36.0	36.0
Valid Yes	48	64.0	64.0	100.0
Total	75	100.0	100.0	

*Source: Field Survey (SPSS), November 2018.*

Table 5 shows that 27 representing 36.0% of the respondents do not have awareness about the mobile application while the remaining 48 respondents representing 64.0% have previous awareness about a mobile application.

**Table 6: Would you like to make use of the mobile application as a means of collecting class attendance?**

	Frequency	Percent	Valid Percent	Cumulative Percent
No	23	30.7	30.7	30.7
Valid Yes	52	69.3	69.3	100.0
Total	75	100.0	100.0	

*Source: Field Survey (SPSS), November 2018.*

Table 6 shows that 23 representing 30.7% of the respondents are not ready to use mobile application for collection of class attendance while the remaining 52 respondents representing 69.3% are ready to make use of mobile application as a means of collecting class attendance.

**Table 7: Do think getting your attendance using mobile application would reduce your waiting in class?**

	Frequency	Percent	Valid Percent	Cumulative Percent
No	33	44.0	44.0	44.0
Valid Yes	42	56.0	56.0	100.0
Total	75	100.0	100.0	

Source: Field Survey (SPSS), November 2018.

Table 7 shows that 33 representing 44.0% of the respondents do not think the mobile application would reduce the waiting time of lecturer, while the remaining 42 respondents representing 56.0% believed that with the mobile application, waiting time would reduce.

## VI. STATISTICAL HYPOTHESIS TEST (CHI-SQUARE TEST)

We also carried out a test for hypothesis either to accept the use of the mobile application for monitoring attendance in the school or to continue with the conventional method of collecting attendance. The hypothesis test was based on either the staffs will embrace the mobile application or not. The tables below show the chi-square hypothesis test.

**Table 8: Would you embrace mobile application as an alternative to the manual method of monitoring student attendance if made available?**

	Observed N	Expected N	Residual
No	28	37.5	-9.5
Yes	47	37.5	9.5
Total	75		

Source: Field Survey (SPSS), November 2018.

**Table 9: Test Statistics**

	Would you embrace mobile application as an alternative to the manual method of monitoring student attendance if made available?
Chi-Square	4.813 <sup>a</sup>
Df	1
Asymp. Sig.	.028

a. 0 cells (0.0%) have expected frequencies less than 5. The minimum expected cell frequency is 37.5.

Source: Field Survey (SPSS), November 2018.

**H<sub>0</sub>**: Mobile application would not be significantly embraced as an alternative to the manual way of monitoring attendance.

**H<sub>1</sub>**: H<sub>0</sub> is not true

We rejected  $H_0$  of no significance since  $X^2$  cal of 4.813 with a p-value (0.028) < 0.05 level. Therefore, mobile application would be embraced significantly as an alternative to the manual method of monitoring attendance at the Federal Polytechnic, Ilaro.

## **VII. CONCLUSION AND FUTURE WORK**

In this paper, we proposed a new system for monitoring the attendance of the students using the Android platform. The results showed improvements in accuracy as compared to using user-based paper-based approach. The attendance system through mobile devices is a very effective tool which can be used to a great extent. The system is portable and can be easily installed and used on any mobile phones supporting Android OS. The system can be further enhanced and several other functionalities can be added.

The system can be made login independent. The present system logs in using offline mode all the time. We can enhance the system by implementing internet mode login feature. The feature to update the attendance at a later stage can also be implemented. The system can also be enhanced by using voice recognition feature of the Android.

## REFERENCE

- Chawhan S. S., Girhale M. P., and Mankar G. (2013). Mobile Phone-Based Attendance System. *IOSR Journal of Computer Engineering* 10(3):48–50.
- Cheng, K., L. Xiang, T. Hirota, and K. Ushijimaa (2005). Effective Teaching for Large Classes with Rental PCs by Web System WTS, Pro. Data Engineering Workshop (DEWS2005), 1D – d3 (in Japanese).
- Kadry, S. and Smaili, M. (2010), Wireless Attendance management System Based on Iris Recognition.
- Kassem, A., Hamad, M., Z. Chalhoub and El Dahdaah, S. (2010). A RFID Attendance and Monitoring System for University Applications, International Conference on Electronics and Communication Systems
- Patel, U. A., and Swaminarayan, P. R. (2014). Development of a Student Attendance Management System using NFCT: A Review. *International Journal of Advanced Research in Computer Science and Management Studies*, 2(8):109–19.
- Shoewu, O., Olaniyi, O. M, and Lawson, A (2011). Embedded Computer-Based Lecture Attendance Management System, *African Journal of Computing and ICT (Journal of IEEE Nigeria Computer Section)*, 4(3):27 – 36.
- Shoewu, O. and Idowu, O., A. (2012). Development of Attendance Management System using Biometrics, *Pacific Journal of Science and Technology*, 13(1):300-307.