



Research Paper

Development of an Android-Based GPA Calculator for Auchi Polytechnic

Braimah Jafaru Lucky

Department of Mass Communication, School of Information and Communication Technology
Auchi Polytechnic, Auchi, Edo State, Nigeria

Ahmed Jimoh

Department of Computer Science School of Information and Communication Technology
Auchi Polytechnic, Auchi, Edo State, Nigeria

ABSTRACT

The conventional approach of using printed Student Handbooks to disseminate information about institutional rules, regulations, and Students' Union constitutions has proven inadequate, as it does not ensure that students have easy access to this information at all times. This limitation often results in students offering various excuses when they violate these rules. Additionally, there is no electronic system to alert students about lectures, forcing them to manage their schedules manually. Students also calculate their GPA/CGPA manually, frequently leading to errors and unnecessary frustration. Moreover, the cost of printing these handbooks is substantial. This study addresses these issues by developing an Android-based application designed to streamline these processes, thus providing better support for students in their academic activities.

Keywords: Institutional Rules, Lecture Alert System, GPA/CGPA Calculation, Android, Student Support

Received 14 July, 2024; Revised 28 July, 2024; Accepted 30 July, 2024 © The author(s) 2024.
Published with open access at www.questjournals.org

I. INTRODUCTION

Students are using their mobile devices more and more frequently, but they are not as productive while using them for important purposes, which leads to wasting time when using the device. These days, every student is interested in technology and keeps up with the latest developments in the field. The range of applications that the internet can enable has expanded dramatically in recent years. The participatory aspect of the internet environment increased the range of phone usage alternatives (Chantry, 2022). The majority of research to date has found that the use of mobile phones by students in schools is problematic due to the competing priorities of youth, parents, and teachers regarding these devices. Teachers are more concerned with issues like classroom discipline, while parents are worried about how to stay in constant contact with their children (Cassar et al., 2023).

Leveraging students' proficiency with mobile devices to provide essential, supportive, and informative resources is a promising research direction. The Student Handbook contains important rules and regulations that each student must be familiar with to ensure a successful campus experience (Doyle, 2023). Unfortunately, many students receive these handbooks upon admission but seldom read them, only consulting them when they have already violated the rules. This lack of awareness has resulted in numerous students facing disciplinary actions, including rustication and expulsion. To address this issue, this study developed an Android application that makes the rules and regulations from the Student Handbook easily accessible on mobile devices. Additionally, the application supports students in other manual tasks, such as maintaining an electronic copy of their lecture timetable with alert notifications and accurately calculating their GPA/CGPA.

There are five sections in the paper. The study was briefly introduced in section one, then it was reviewed in section two. The third component of the study covered the methodology. Section five brings the study to a close, with Section Four presenting the results and discussing them.

II. LITERATURE REVIEW

2.1 Smart Android Devices

The widespread availability of mobile phones, largely due to their affordability, has made the Android operating system highly popular. While students' use of phones has had both positive and negative impacts, their portability provides a significant advantage by serving as a valuable communication tool, which has recently found meaningful applications in educational settings. Developed by Google, the Android operating system uses a virtual keyboard and touch input to interact with on-screen elements. Android smartphones offer several benefits, including large display screens, cost-effectiveness compared to Apple, Blackberry, and similar devices, and easy access to a wide range of Android apps (Umar & Wakili, 2023).

2.2 Student Handbook

The student handbook outlines the rules, guidelines, and regulations that govern behavior, conduct, and interactions within the institution, ensuring that students can successfully complete their studies. It is crucial for students to read and understand the handbook to fully participate in all aspects of campus life. Upon joining an institution like Auchi Polytechnic, students pledge to abide by these rules and regulations, acknowledging that any violations will incur the penalties specified in the handbook. These rules remain in effect throughout a student's enrollment, making it equally important for parents to be aware of this information to better guide their children. The handbook is published annually and distributed to new students at the beginning of each academic session (Barkley et al., 2014).

Beyond academic grooming, a key objective of higher education institutions is to cultivate well-rounded individuals, fostering intellectual, emotional, social, ethical, and spiritual development. This holistic growth occurs as students engage in relationships and activities that provide optimal challenges (Borowiec et al., 2021). Numerous educational apps have been developed to support this goal, including those for ubiquitous learning, campus navigation, class identification, and mobile security (Nugraha & Rahman, 2021; Siji Rani & Krishnanunni, 2020).

The Auchi Polytechnic handbook contains comprehensive rules and regulations, detailing offenses and penalties to ensure students have a successful campus experience (Collins et al., 2014). This handbook is typically distributed to new students during registration. However, our findings indicate that over 80% of students fail to read it. It is often only after encountering issues that they realize the existence of these rules.

2.3 Grade Point Average (GPA) and Cumulative Grade Point Average (CGPA)

In order to assess a student's performance over time and to ascertain if they are eligible for specific academic actions, the grade point average and cumulative grade point average are calculated. According to Vanichvatana (2023), the weighted mean value of all the points obtained in exams throughout a semester is the grade point average. To calculate the semester GPA, multiply the course units by the equivalent grade point, add the total grade points earned for each course, and divide the result by the total number of units taken. Meanwhile, the CGPA is calculated by averaging all of a student's earned points and dividing by the total possible points (Nuga et al., 2024). The Auchi Polytechnic student handbook also provides guidelines on calculating both grade point average (GPA) and cumulative grade point average (CGPA). This valuable information is often underutilized by students due to its presentation format. Leveraging the device students are most familiar with—the mobile phone—to convey this essential information is a step in the right direction. Android, a widely used mobile operating system, is prevalent on more devices and has more users than any other mobile OS today (Umar & Wakili, 2023).

III. METHODOLOGY

3.1 Data Gathering and Analysis

The latest edition of the Student Handbook for the institution was acquired. This hardcopy version was then converted into a digital format to be utilized within the application. Information on the manual calculation of GPA/CGPA was extracted and analyzed, using the institution's specific grade point system as a case study. This process facilitated the computerization of the entire procedure.

3.2 Design of the User Interface and Modules

User-friendly forms for interaction were developed. The interface includes modules representing the Student Handbook's modular structure: the Rules and Regulations Module (RRM), GPA Calculation Module (GPA-CM), and Lecture Time Table Alert Module (LTTAM).

3.3 Software Requirements

For front-end development, the latest version of the Java Development Kit (JDK 17) was used as the compiler, and Eclipse IDE served as the development environment. PhoneGap was used for building the mobile application. The backend database was MySQLite, with the MySQLite Java Helper containing all necessary code for database operations.

IV. RESULTS AND DISCUSSION

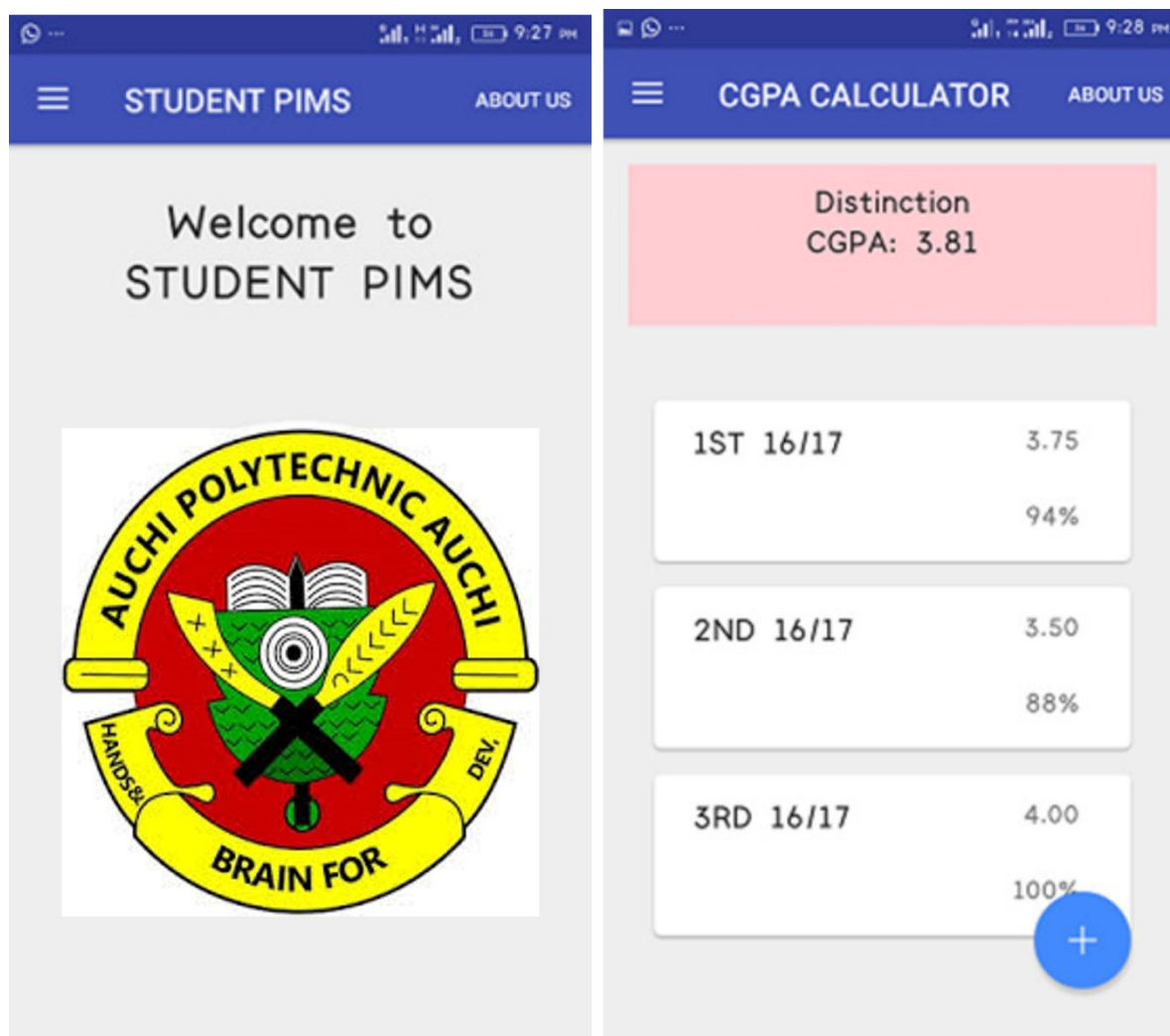


Figure 1: Homepage and sample CGPA

The home page of the student application features the institution's logo and the name PIMS (Personal Information Management System) adopted for the system. The main menu of the Android application displays all functions, including a GPA calculator, an e-copy of the Student Handbook, and a lecture timetable organizer and alert system. The GPA calculator computes the student's GPA per semester based on the scores and course units provided by the student, displaying the computed GPA. Another feature allows students to organize their lecture timetable electronically, incorporating an alert system to remind them of each lecture period. Additionally, the application includes an electronic version of the Student Handbook, making it easily accessible on the student's Android mobile phone. This student app serves as an organizer to assist with major tasks and ensure that useful information is always accessible to students.

V. CONCLUSION

This study introduced an Android-based mobile application designed to assist students in computing their grade point average (GPA) and cumulative grade point average (CGPA), managing their timetable, and providing easy access to an electronic version of the student handbook. The application was successfully developed, tested, and confirmed to function as intended. It efficiently stores and processes students' academic results and acts as an organizer for lecture and exam schedules, delivering high speed and accuracy. The user-friendly graphical user interface (GUI) enhances ease of use compared to a command-line interface. Additionally, the application is secure and maintains data integrity by utilizing a relational database management system.

With this application, students can verify their GPA/CGPA against the official records released by the school. The alert system in the timetable ensures students are prompt for their classes. Moreover, the electronic student handbook provides essential information readily accessible at any time, helping students avoid potential issues. The app has been deployed on the Google Play Store for students at the Auchi Polytechnic, Edo State, Nigeria, and can be adapted for use by any educational institution.

REFERENCES

- [1]. Barkley, E. F., Major, C. H., & Cross, K. P. (2014). Collaborative learning techniques: A handbook for college faculty. John Wiley & Sons.
- [2]. Borowiec, K., Kim, D., Wang, L., Kim, J., & Wortham, S. (2021). Supporting holistic student development through online community building. *Online Learning*, 25(4), 125–155.
- [3]. Cassar, C., Oosterheert, I., & Meijer, P. C. (2023). Why teachers address unplanned controversial issues in the classroom. *Theory & Research in Social Education*, 51(2), 233–263. <https://doi.org/10.1080/00933104.2022.2163948>
- [4]. Chantry, W. (2022). 'Built from the internet up': Assessing citizen participation in smart city planning through the case study of Quayside, Toronto. *GeoJournal*, 88(2), 1619–1637. <https://doi.org/10.1007/s10708-022-10688-3>
- [5]. Collins, U. U., Celestine, A. U., & Faith, A. N. (2014). Social Networks: A Curse or a Blessing?(A Case Study of Selected Students from Auchi Polytechnic). <https://www.academia.edu/download/71882861/223.pdf>
- [6]. Doyle, T. (2023). Helping students learn in a learner-centered environment: A guide to facilitating learning in higher education. Taylor & Francis.
- [7]. Nuga, O. A., Adekola, T. O., & Abdulhamid, A. Z. (2024). Assessing the impact of Ordinary Level Grades on the Cumulative Grade Point Average of First Year University Students (A Factorial Design Approach). *East African Journal of Education Studies*, 7(1), 144–154.
- [8]. Nugraha, A., & Rahman, F. A. (2021). Android application development of student learning skills in era society 5.0. *Journal of Physics: Conference Series*, 1779(1), 012014. <https://iopscience.iop.org/article/10.1088/1742-6596/1779/1/012014/meta>
- [9]. Siji Rani, S., & Krishnanunni, S. (2020). Educational App for Android-Specific Users—EA-ASU. In Y.-C. Hu, S. Tiwari, M. C. Trivedi, & K. K. Mishra (Eds.), *Ambient Communications and Computer Systems* (Vol. 1097, pp. 325–335). Springer Singapore. https://doi.org/10.1007/978-981-15-1518-7_27
- [10]. Umar, A. U., & Wakili, A. (2023). A Comparative Study of Modern Operating Systems in terms of Memory and Security: A Case Study of Windows, iOS, and Android. *SLU Journal of Science and Technology*, 6(1 & 2), 131–138.
- [11]. Vanichvatana, S. (2023). Passion to Learn Well With Reflections of CGPA and Course Levels: Empirical Evidence. *Journal of Higher Education Theory & Practice*, 23(16).