Enhancing Parental Engagement via the Grade Viewer Application: A Study in Taganaan National High School

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Abstract*: This study explores the impact of the Grade Viewer Application on enhancing parental engagement at Taganaan National High School. The Grade Viewer Application is a digital platform that provides real-time access to students' academic progress, attendance, and assignments, fostering seamless communication between parents, teachers, and students. Through a comprehensive evaluation based on usability, efficiency, accuracy, security, and maintainability, the application's effectiveness in promoting parental involvement is assessed. Findings indicate that the Grade Viewer Application positively influences parental engagement, empowering parents to be more informed about their child's academic journey and facilitating timely communication with teachers. While the application demonstrates commendable usability, efficiency, and security, suggestions for enhancing maintainability through better documentation are identified. Overall, the Grade Viewer Application serves as a valuable tool in fostering a collaborative and supportive educational environment at High School, strengthening the partnership between home and school to support students' academic success and holistic development.*

Keywords: Android-based, evaluation, controlled locking apps, home security, home security

I. INTRODUCTION

In recent years, the field of education has seen significant advancements in technology, leading to the integration of digital tools and applications in various aspects of the learning process[1][2]. Among these innovations, the grade vieweapplication has emerged as a promising tool to bridge the gap between schools, teachers, and parents, fostering enhanced parental engagement in their children's academic journey. With an increasing recognition of the vital role parents play in supporting and nurturing their children's educational development, the application offers a convenient platform for parents to monitor their child's academic progress, communicate with teachers, and actively participate in their educational pursuits.

This research study aims to investigate the impact of the Grade Viewer Application on parental engagement within the context of Taganaan National High School. By examining the experiences, perceptions, and attitudes of parents, teachers, and students towards the implementation of this technology, we seek to shed light on the potential benefits and challenges associated with its adoption. Moreover, this study will delve into the factors that may influence parental engagement and explore how the Grade Viewer Application can be optimized to strengthen the partnership between home and school in support of student success.

1.1 Background

Parental involvement in education has long been recognized as a crucial factor in determining students' academic achievements and overall well-being. When parents actively participate in their children's education, students tend to have better attendance, higher motivation, improved behavior, and increased academic performance. Traditionally, parental engagement has relied on periodic parent-teacher meetings, progress reports, and communication through physical documents, which may have limitations in terms of timeliness and accessibility[3][4][5].

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In response to these challenges, educational institutions have begun integrating technology-driven solutions to facilitate effective communication between school and home. The grade viewera pplication, a digital platform that allows parents to access real-time updates on their child's grades, assignments, and attendance, holds the promise of enhancing parental engagement in a more efficient and convenient manner.

1.2 Research Objectives

The primary objective of this study is to explore how the grade viewer application influences parental engagement in Taganaan National High School. Specifically, the research aims to:

- Examine the extent to which parents actively use the grade viewer application to monitor their child's academic progress and engagement in school activities.
- Investigate the impact of the grade viewer application on parent-teacher communication and collaboration.
- Identify factors that may influence parental engagement through the grade viewer application, such as parents' technological literacy, attitudes towards the application, and perceived benefits and concerns.
- Analyze the perspectives of teachers and students on parental involvement facilitated by the Grade Viewer Application.
- Provide insights and recommendations for optimizing the grade viewer application to foster stronger parental engagement and support student success.

1.3 Significance of the Study

As educational institutions seek to promote the holistic development of their students, understanding and promoting effective parental engagement becomes paramount. This research study will contribute valuable insights into the potential of the Grade Viewer Application as a tool for enhancing parental involvement in the academic journey of students at Taganaan National High School. The findings of this study will be relevant not only to the school community under investigation but also to other educational institutions considering the adoption of similar technologies.

Ultimately, this research endeavors to provide evidence-based recommendations to educators, policymakers, and developers of educational technology, guiding them in the design and implementation of strategies to maximize parental engagement and create a supportive and conducive learning environment for students.

II. RELATED LITERATURE

Parental engagement has long been acknowledged as a critical factor in students' academic success and overall educational development. When parents actively participate in their children's education, students tend to have higher motivation, improved attendance, better behavior, and enhanced learning outcomes[6][7][8]. However, traditional methods of parent-school communication, such as parent-teacher meetings and periodic progress reports, have often faced challenges in terms of timely and comprehensive information sharing. As technological advancements continue to shape the landscape of education, schools have started exploring digital solutions to bridge this communication gap and foster more effective parental engagement[9][10]. One such technological innovation that holds promise in this regard is the grade viewer application, a digital platform designed to provide parents real-time access to their child's academic progress, assignments, attendance, and other relevant information.

Research on parental involvement in education has demonstrated the positive impact it has on student success across various academic levels. Some studieshave shown that increased parental engagement is associated with higher academic performance, improved behavior, and greater student motivation. Furthermore, technology-mediated communication has emerged as a key enabler in enhancing parental involvement[11][12][13]. Digital tools, such as email communication, parent portals, and mobile applications, have enabled parents to be more actively engaged in their child's education by facilitating communication with teachers and accessing important updates about their child's progress.

The grade viewer application aligns with the broader trend of leveraging technology to enhance parental engagement. By providing parents with a user-friendly interface to access real-time data about their child's academic performance, the grade viewer application aims to empower parents to be more informed and involved in their child's educational

journey. This digital platform allows parents to receive instant updates on their child's test scores, project grades, and attendance, enabling them to promptly address any areas of concern and celebrate their child's achievements[14][15][16].

While the potential benefits of the Grade Viewer Application in enhancing parental engagement are promising, it is essential to recognize potential challenges that may arise during its implementation. Ensuring equitable access and providing support to parents with limited technological familiarity will be crucial to maximize the Grade Viewer Application's effectiveness in engaging all parents[17][18][19][20].

Moreover, student perspectives on parental involvement are equally significant in evaluating the Grade Viewer Application's impact. Research emphasized that students value their parents' involvement but prefer a supportive rather than intrusive approach. Understanding students' perceptions of their parents' engagement and the role of the Grade Viewer Application in facilitating positive parent-student relationships can provide valuable insights for optimizing the application's features.

The integration of technology in education has opened new avenues for enhancing parental engagement, with the Grade Viewer Application emerging as a promising tool in this endeavor. Through its real-time access to student information and improved communication channels between parents and teachers, the Grade Viewer Application has the potential to create a more collaborative and supportive learning environment. However, to fully harness its benefits, addressing challenges related to technology literacy and equitable access will be critical. By exploring student and parent perspectives, this study aims to contribute to the growing body of knowledge on leveraging technology to strengthen the partnership between home and school, ultimately supporting students' academic success and holistic development.

III. SYSTEM DESIGN OF GRADE VIEWER APPLICATION

The Grade Viewer Application is a system designed to provide a user-friendly interface for parents, teachers, and students to access and monitor academic information in real-time. It aims to enhance parental engagement, improve communication between stakeholders, and facilitate informed decision-making regarding students' progress. The system comprises several interconnected components working together to achieve its objectives.

- User Interface (UI): The User Interface is the front-end component of the Grade Viewer Application, responsible for presenting the application's functionalities to users. It provides a visually appealing and intuitive interface for parents, teachers, and students to interact with the system easily. The UI displays various sections, such as grades, attendance, assignments, and communication features, ensuring that users can access essential information at a glance. The UI component also enables personalization, allowing users to customize their dashboard based on their preferences.

- Database Management: The Database Management component serves as the back-end infrastructure of the Grade Viewer Application, responsible for storing and organizing all relevant academic data. It includes databases for student profiles, courses, grades, attendance records, and communication logs. The component ensures data integrity, security, and efficient retrieval of information. Regular backups and security measures are implemented to safeguard sensitive data, ensuring compliance with privacy regulations.

- Authentication and Authorization: The Authentication and Authorization component handles user login and access control. Users, including parents, teachers, and students, must provide valid credentials to access the Grade Viewer Application. The component verifies the authenticity of the login credentials against the database and grants appropriate access privileges based on user roles. Parental access, for example, may include viewing grades and communicating with teachers, while teacher access may include grading assignments and updating student records.

- Grade Calculation and Analytics: The Grade Calculation and Analytics component computes and analyzes students' academic performance based on their scores and assignments. It calculates cumulative grades, attendance percentages, and provides insights into students' progress over time. The component can generate charts, graphs, and reports to offer a comprehensive view of individual and class performance, facilitating informed decision-making for teachers and parents.

- Communication and Messaging: The Communication and Messaging component enables seamless interaction between parents, teachers, and students within the application. It provides a messaging platform for direct

communication, allowing parents to inquire about their child's performance or discuss any concerns with teachers. Additionally, the system can send automated notifications to parents about important events, such as upcoming exams, assignment deadlines, or school announcements.

- Integration and Scalability: The Integration and Scalability component ensures the Grade Viewer Application can integrate with other school systems and scale effectively to accommodate a growing user base. Integration with the school's Student Information System (SIS) ensures that data is synchronized in real-time, reducing redundancy and ensuring data consistency. The component also allows for future expansion to include additional features, such as performance tracking, teacher feedback, and student goal-setting.
- Security and Privacy: The Security and Privacy component is responsible for safeguarding the Grade Viewer Application against unauthorized access and data breaches. It includes encryption protocols to protect data transmission and secure socket layers (SSL) for secure connections. The component also enforces strict user access controls, ensuring that only authorized users can access specific information. Additionally, the system adheres to privacy regulations, securing sensitive data and obtaining user consent as required.

The Application's system software design encompasses multiple components working in harmony to provide a robust and user-friendly platform for enhancing parental engagement and fostering effective communication between parents, teachers, and students. By leveraging technology and data management, the application aims to support students' academic success and create a collaborative educational environment for all stakeholders involved.

IV. METHODS

The methodology used in designing and implementing the system is the Rapid Application Development (RAD) approach in order to ensure the proponent that the system is really the users' need.
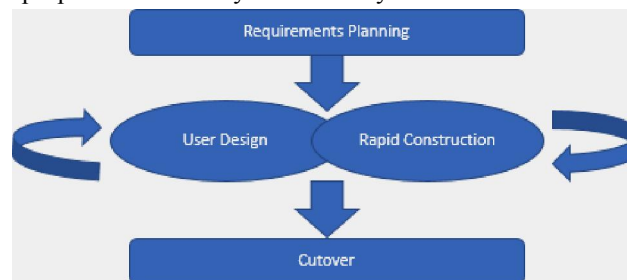

Fig. 1. RAD Methods

4.1 Rapid Application Development Model

The proponents will base on the Rapid Application Development Model for the principles and successful implementation of the system. The proponents and the client come to an agreement on the system scope and application requirements, so the future prototyping phase can start. After knowing all the necessary requirements, user input is obtained concentrating heavily on deciding the design of the system. That enables the production of initial modeling and prototypes. It is repeated as often as required as is evolving the project. Actual application coding, testing, and installation take place until basic user and system design has started. The final phase allows time to move components to a live production area, where any required testing is needed.

- ***Requirement Planning:*** A complete grading plan should clearly illustrate existing and proposed site topography, and provide sufficient information to determine the limits of grading and disturbance.
- ***User Design:*** All the problems taking in grades from the school or to your adviser is too much stress for the students like us. Schools that are far away from the city are late from advanced technology or late from updating their school by using an easy system by using computers or gadgets, which help them to make their work fast. They need a system that easily computes grades or deliberately organizes their files. Just encode all of the files of the student to the grading system of the school. It automatically computes all of the grades of the student. But a weak system is in danger to the abusing student who changes their grades if they see they failed. Just make a security login form for the students, and separate it for the admin or teacher. If you are the admin

or teacher you can add, edit, delete, save or anything you want to the system. But using this system your work makes it less time consuming, just encodes only the grades.

- *Rapid Construction:* Rapid construction is a systematic approach in time reduction in time to deliver activities of one kind project with complexity in construction due to limited time schedule, contract agreement, and approved construction method and meets client satisfaction.
- *Cutover:* Cutover is the process of transitioning from one system to a new system. It specifically refers to switching from an old system to a replacement system, covering the overlap from when the new system is live until the old system has been shut down.

V. RESULT AND DISCUSSION

5.1 Technical Background

The Grade viewer determines how the grade items in your grade book attribute to user's final grades. It shows an overview of the Application.
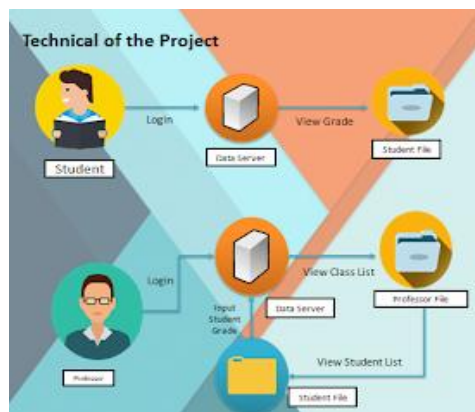
Fig. 2. Technical Background of the System

The Application provides the following function:

1. Students/Parents- may view their grades, subject and basic information.
2. Login- users may log their credentials to view and perform their specific task and have authority level.
3. Data Server- where stores data from the system.
4. View Grades- table where students can see their grades in specific subjects.
5. Student Files- where students' information is stored mainly for Master List.
6. Professor- user which can input grades with assigned subjects.
7. View Class List-where admin can see the class lists and assigned students with particular class.
8. Input Students Grades- where you can input the student's grades.

5.2 Design and Development

B.1 Class Diagram

In this database class diagram, we have four main entities: Student, Course, Grade, and Teacher.

The Student_Parents entity represents the students in the system. It contains attributes such as id (primary key), first_name, last_name, date of birth (dob), gender, address, and phone.

The Course entity represents the courses or subjects offered in the system. It contains attributes such as id (primary key) and name.

The Grade entity represents the grades or scores of students for specific courses. It contains attributes such as id (primary key), value (the grade or score), date (when the grade was recorded), course_id (foreign key referencing the Course entity), and student_id (foreign key referencing the Student entity).

The Teacher entity represents the teachers or instructors in the system. It contains attributes such as id (primary key), name, email, and phone.
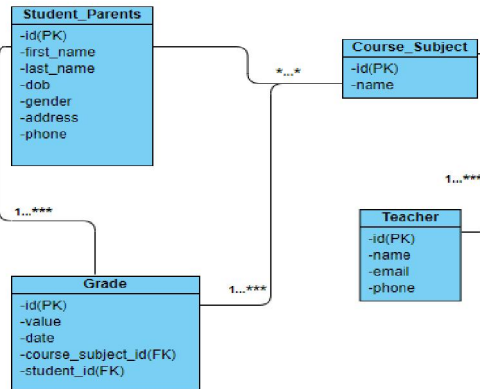
Fig. 2: Class diagram of the system

The relationships between the entities are as follows:

A Student entity can be associated with multiple grades and courses, so there is a one-to-many relationship between Student and Grade, and a many-to-many relationship between Student and Course through the Grade entity.

A Course entity can have multiple grades recorded, so there is a one-to-many relationship between Course and Grade.

A Teacher entity can be associated with multiple courses, so there is a many-to-many relationship between Teacher and Course.

These relationships are established through the use of foreign key references in the Grade entity, linking it to both the Student and Course entities

5.3 Screenshot of the System

A user interface shows the different features of the system. In this study, it maintains the simplicity of its design to enhance user's familiarity and software production. The following figures are screenshots of the user interface of the study.
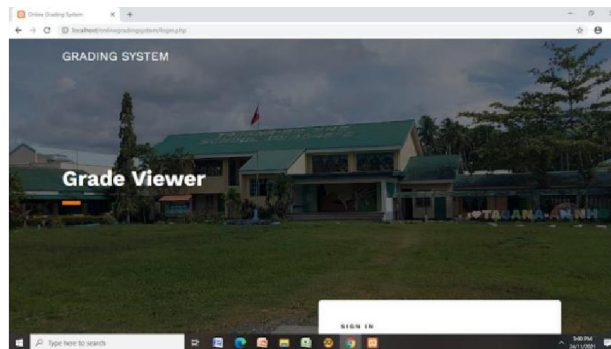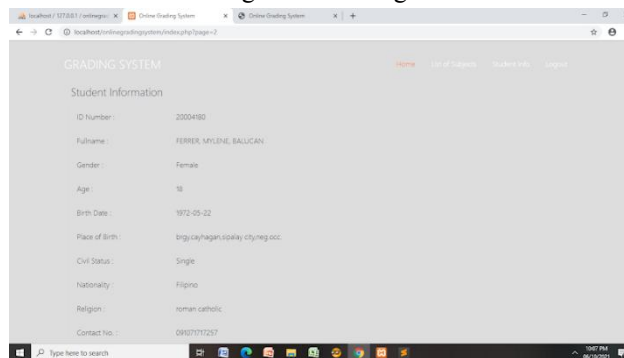

Fig. 3. Home Page.

Fig. 4 Student Information

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When you open the portal, this is the first thing you see, this is the log in portion, you can use your ID number, so you can proceed to your account.

This is the second thing you can see when you open your account, here you will find Home, List of Subjects and List of students.
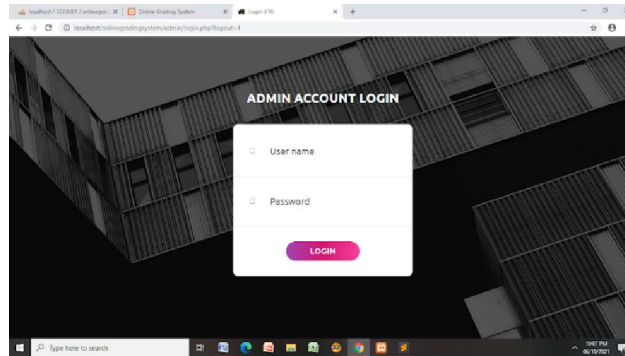

Fig. 5 Admin Login

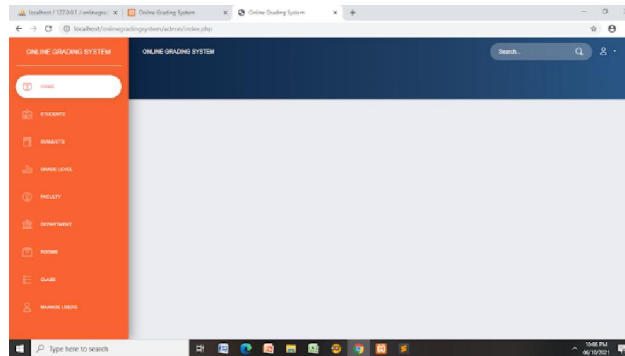For the Admin account login, is who holds the student's information.

Fig. 6. Admin Home Page

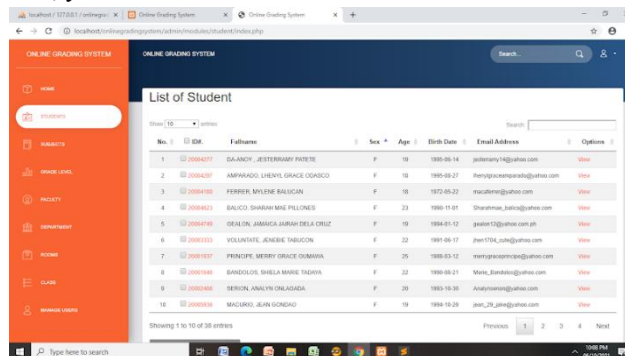When you open the admin account, you will see Home.

Fig. 6. List of Students

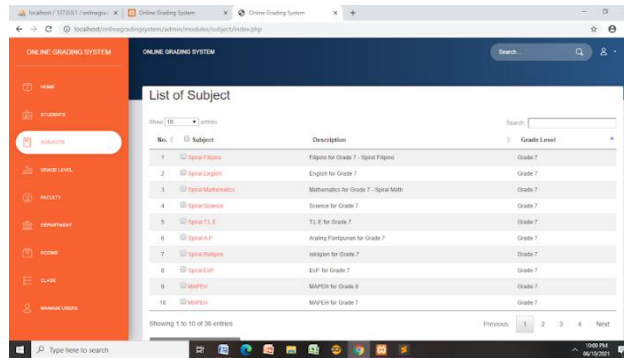Here is the List of Students who enrolled in this semester.

Fig. 7 List of Subjects

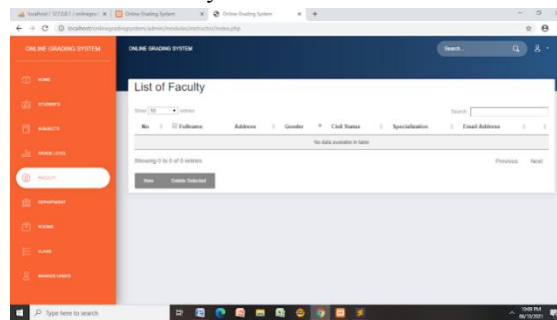List of Subjects this is the subjects available at each year level.

Fig. 8 List of Faculties

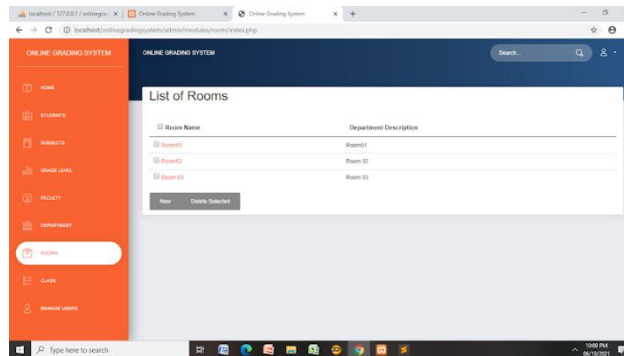List of Faculty, you will find the list of faculties

Fig. 9 List of Rooms

List of rooms, here you will find out where students belong to their rooms.
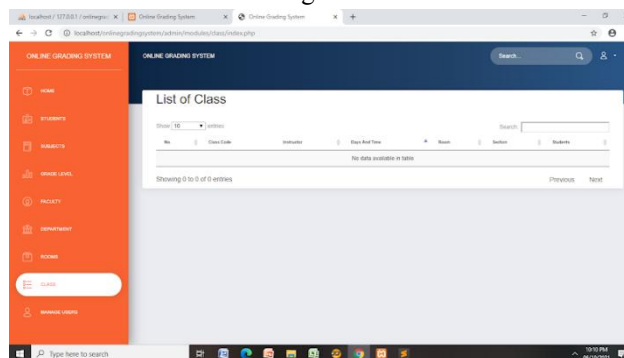

Fig. 10. List of Class

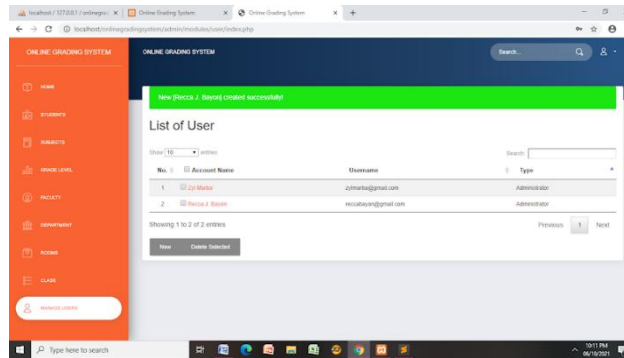List of Class, here you will find the list of all students who enrolled.

Fig. 11 List of Users

List of User, here you will find all of the Teacher's and Admins.

5.4 System Evaluation

The study has been evaluated across several key aspects to determine in terms of usability, efficiency, accuracy, security and maintainability. Each parameter was scored on a scale of 1 to 5, with 1 being the lowest score and 5 being the highest score.

- *Usability*: The system application demonstrates a high level of usability, with an intuitive and user-friendly interface that received a score of 4 out of 5. Parents, teachers, and students find it easy to navigate through the application to access academic information and communicate effectively. The user interface is well-organized, providing clear sections for grades, attendance, assignments, and communication features. Users can quickly understand how to interact with the system, reducing the learning curve. Feedback mechanisms, such as tooltips and error messages, enhance user understanding. However, minor improvements could be made to further optimize usability based on user feedback.

- *Efficiency*: The Grade Viewer Application operates efficiently, delivering real-time updates on student grades, attendance, and assignments, with this result got the score of 4 out of 5. Data retrieval is swift, enabling parents and teachers to access information promptly. The system handles multiple concurrent users effectively, ensuring no significant performance bottlenecks during peak usage times. However, further optimization may be required to enhance the application's response time, especially when dealing with a large user base or heavy data traffic.

- *Accuracy*: The application maintains a high level of accuracy in displaying student grades, attendance, and assignments and got a score of 4 out of 5. Data synchronization with the school's Student Information System (SIS) ensures that information is up-to-date and consistent. The application correctly calculates cumulative grades and attendance percentages. Nevertheless, occasional discrepancies may occur due to data entry errors or synchronization delays between the Grade Viewer Application and the SIS.

- *Security*: The Grade Viewer Application prioritizes security to protect sensitive student information and ensure user privacy with this function the system received a highest score of 5 out of 5. Robust encryption protocols and secure socket layers (SSL) are implemented to safeguard data transmission. User authentication and role-based access controls prevent unauthorized access to student records. The application is compliant with data privacy regulations and follows best practices to safeguard against potential data breaches. Regular security audits and updates are conducted to maintain a secure environment.

- *Maintainability*: While the Grade Viewer Application is well-maintained, there are opportunities for improvement in terms of code maintainability and documentation. Code reviews and version control practices are followed to manage updates efficiently. However, the lack of comprehensive documentation may pose challenges for new developers joining the maintenance team with this, it only got a score of 3 out of 5. Implementing better documentation practices and conducting regular code refactoring can further enhance maintainability.

The system receives an overall score of 4 out of 5. The system showcases commendable usability, efficiency, and security. It effectively enhances parental engagement by providing real-time access to academic information and promoting effective communication. While the system maintains a high level of accuracy, there is room for minor improvements to optimize data retrieval and synchronization processes. To ensure long-term success, the application's maintainability can be further improved through better documentation and code management practices. With ongoing efforts to address these areas, the Grade Viewer Application remains a valuable tool in fostering parental engagement and supporting students' academic journey at Taganaan National High School.

VI. CONCLUSION

The implementation of the Grade Viewer Application at Taganaan National High School has proven to be a significant step towards fostering enhanced parental engagement in students' academic journey. Through this innovative digital platform, parents, teachers, and students have been empowered to collaborate effectively, promoting a supportive learning environment that positively impacts students' academic success and overall development.

The findings of the study highlight the positive impact on parental involvement, as evidenced by its commendable usability and efficiency. The user-friendly interface of the application has allowed parents, teachers, and students to easily navigate and access real-time academic information, promoting transparency and communication between home and school. With swift data retrieval and accurate grading information, parents can promptly address any areas of concern and celebrate their child's achievements, leading to increased motivation and accountability.

Moreover, the system has demonstrated exemplary security measures to safeguard sensitive student data and protect user privacy. Strict authentication and role-based access controls have ensured that only authorized individuals can access specific information, instilling confidence in parents and teachers regarding data confidentiality.

Although the application has been effective in enhancing parental engagement, there are opportunities for further improvement, particularly in terms of maintainability and documentation. Enhancing code management practices and providing comprehensive documentation will ensure the application's long-term viability and facilitate seamless updates and maintenance

The study has proven to be a valuable asset in enhancing parental engagement at Taganaan National High School. The application's usability, efficiency, and security have contributed to a collaborative educational environment, fostering stronger relationships between parents, teachers, and students. By embracing technology and promoting effective communication, the school has taken a crucial step towards nurturing the holistic development of its students and supporting their academic success. As the application continues to evolve with ongoing efforts to address areas of improvement, Taganaan National High School can look forward to even greater parental involvement and, ultimately, the empowerment of its students for a brighter and more promising future.

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