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Parental Management System

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Abstract
The Parental Management System (PMS) is a full-stack web application that improves communication between colleges and parents. It encourages parental involvement by providing real-time access to students' academic progress, attendance, and internal assessments. PMS offers secure logins for parents, faculty, and administrators, along with easy-to-use dashboards and clear data visualization for better understanding. Role-based authentication ensures privacy and proper access for all users. By centralizing academic updates, the system promotes transparency, accountability, and active parental engagement. This consistent involvement helps enhance student performance and supports their academic journey. PMS is designed to be scalable, efficient, and adaptable to various educational institutions, making it a valuable tool for improving collaboration between parents and schools and enhancing the overall learning experience.
Keywords: *Parental Management, Academic Tracking, Student Monitoring, Full-Stack Web Application, Communication Portal.*

1. Introduction
Effective communication between educational institutions and parents is crucial for student success. However, many colleges lack a centralized, accessible platform where parents can view their child's academic progress, interact with teachers, or keep up with institutional events. To address this, we propose a Parental Management System (PMS), a web-based solution aimed at bridging this gap. The system is developed using HTML, CSS, and JavaScript on the frontend and PHP for the backend, with MySQL for database management. The system allows parents to monitor student attendance, marks, fee status, and communicate directly with teachers. Teachers can manage academic records and event announcements, and the admin maintains system-wide controls. I. LITERATURE REVIEW The integration of technology in educational environments has led to the development of several systems aimed at enhancing communication between stakeholders—students, teachers, and parents. This literature survey reviews key contributions and existing systems related to parental engagement, web-based communication platforms. academic portals, and Parental Involvement in Academic Success According to Epstein (2001), parental involvement significantly influences students' academic achievement. A digital platform that facilitates continuous monitoring and communication can improve parental engagement, which in turn leads to better academic outcomes. Research has also shown that when parents are aware of academic schedules, grades, and attendance, they are more likely to support their children's education at home (Hornby, 2011). Learning Management Systems (LMS) Learning Management Systems such as Moodle, Blackboard, and Canvas provide comprehensive academic tools primarily for student-teacher interaction. These systems offer features like grade tracking, assignment uploads, and announcements. However, parental involvement is usually minimal or indirect. Moodle does allow for parent roles, but it requires technical configuration and lacks direct messaging capabilities with teachers (Rahman et al., 2020). Mobile and Web-Based Parent Portals Some educational institutions use parent portals like PowerSchool or Skyward, which offer dashboards for grades, attendance, and school announcements. While effective, these platforms are often expensive and require subscription licenses, making them inaccessible to small or rural

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institutions. Moreover, customization is limited, especially when trying to tailor the platform to local academic workflows (Zhao et al., 2019). Communication Systems in Education Messaging and notification systems are crucial for timely updates and emergency communication. Apps like ClassDojo and Remind offer messaging services between teachers and parents but are mainly used in primary or high school settings. They do not support full academic record tracking or event management, nor are they open source or customizable (Singh & Kaur, 2018). Need for Custom Web-Based Solutions There is an increasing demand for affordable, customizable platforms developed using open web technologies like HTML, CSS, JavaScript, PHP, and MySQL. These technologies allow educational institutions to build role-based systems that meet specific administrative, academic, and communicative needs (Patel et al., 2021). Local hosting, ease of development, and cost-effectiveness are significant advantages of such systems [1].

2. Related Work

Teacher Panel Several academic institutions use Learning Management Systems (LMS) like Moodle or Blackboard, but these platforms often focus on student-teacher interaction and miss the parental engagement aspect. While applications like ClassDojo or Edmodo provide some parental access, they often lack customization and deeper institutional integration. This project fills the gap by offering a low-cost, customizable platform tailored for college-level institutions, offering transparency, secure communication, and administrative flexibility.

2.1 User Roles

- **Parent:** View academic records, college information, and message teachers.
- **Teacher:** Manage student data, update attendance/marks, and post event notices.
- **Admin:** Full control over the system including user registration, teacher management, and event oversight.

2.2 System Features

The proposed Parental Management System is designed with role-based access to provide tailored functionalities to parents, teachers, and administrators. Each user type is presented with an interface and feature set that aligns with their responsibilities and needs within the academic ecosystem.

2.3 Parental Dashboard

The Parental Dashboard serves as the central point of interaction for parents, enabling them to stay informed about their child's academic journey. Upon logging in with institution-provided credentials, parents are granted access to a personalized dashboard that includes their child's profile information, academic results, attendance records, and fee payment status. In addition to academic data, parents can view a dynamic college calendar that outlines upcoming exams, events, holidays, and important deadlines. A secure messaging interface is also integrated, allowing parents to communicate directly with teachers to discuss academic concerns, behavioral issues, or provide feedback. This streamlined access to academic and institutional data fosters stronger parent involvement and promotes transparency in the student's education.

2.4 Teacher Panel

The Teacher Panel is designed to simplify academic data management and facilitate communication with parents. Teachers can update and manage student records such as marks and attendance directly through the portal. This ensures real time availability of academic data to parents. Additionally, teachers can use the platform to send messages to individual parents, groups of students, or the entire class, thereby improving the responsiveness and clarity of parent-teacher communication. Furthermore, teachers have the capability to create and publish event posts—such as upcoming exams, college functions, or departmental seminars—ensuring that all stakeholders remain informed about important academic and extracurricular activities.

2.5 Admin Console

The Admin Console provides full control over the platform's operations and user management. Administrators have the authority to create, edit, or delete user accounts for teachers and parents, ensuring proper access control and system integrity. They can also oversee and moderate all communication that occurs through the messaging system, safeguarding the platform against misuse and

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maintaining appropriate communication standards. The admin is also responsible for managing college-wide announcements and monitoring system analytics to evaluate user engagement, system usage patterns, and data trends. This centralized control empowers administrators to maintain an organized and well-functioning academic portal that supports the needs of all users.

2.6 Implementation Details

The Parental Management System was developed using open source technologies, ensuring accessibility, ease of customization, and cost-effectiveness. This section outlines the structure of the backend database, security protocols implemented for safe user interaction, and design principles followed for the user interface.

2.7 Database Schema

The system utilizes a relational database structured in MySQL, where each table corresponds to a specific functional area of the application. The Users table holds the login credentials for all users and includes role identifiers to distinguish between parents, teachers, and administrators. The Students table contains academic records such as grades, attendance, and fee status, and it is linked to the parent account for seamless data access. To enable communication between users, the Messages table records all sent messages along with their timestamps and sender/receiver IDs. Lastly, the Events table stores details of institutional events such as exams, functions, and holidays, which are publicly accessible to all users on the platform. These well-structured tables form the backbone of the system's data management layer.

2.8 Security Measures

Security is a critical component of the system, particularly given the sensitive nature of academic data and personal user information. To protect user credentials, passwords are hashed using PHP's built-in password_hash() function, ensuring secure storage and resistance to brute-force attacks.

2.9 User Interface

The user interface of the Parental Management System is designed with a focus on usability, accessibility, and responsiveness across devices. The layout is built using the Bootstrap framework, which enables consistent styling and mobile compatibility. A sidebar navigation menu is implemented for easy access to different dashboard sections, such as student records, messaging, or events. Visual cues like color-coded alerts are incorporated to indicate important updates, such as new messages or upcoming deadlines. The interface prioritizes clarity and simplicity, ensuring that even users with limited technical skills can navigate and use the platform effectively [2].

2.10 System Interface

The following figure illustrates the main interface of the Parental Management System. This screenshot shows the dashboard as viewed by a parent after logging in. Key features such as student academic records, attendance, fee status, college announcements, and the messaging system are clearly displayed. The layout is designed using HTML and CSS, with responsive behavior enabled through Bootstrap. This visual representation demonstrates the practical implementation and usability of the system in a real-world scenario, Shown in Figure 1 & Figure 2.

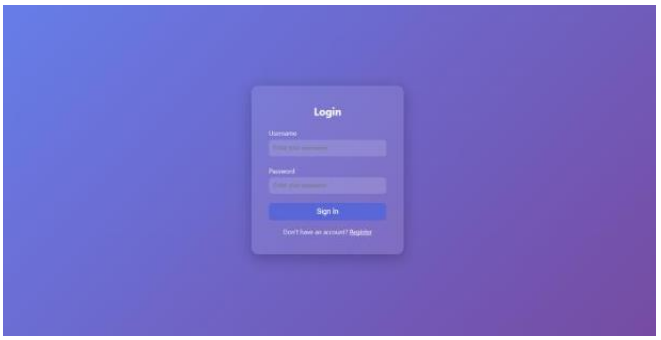

Figure 1 Login Page

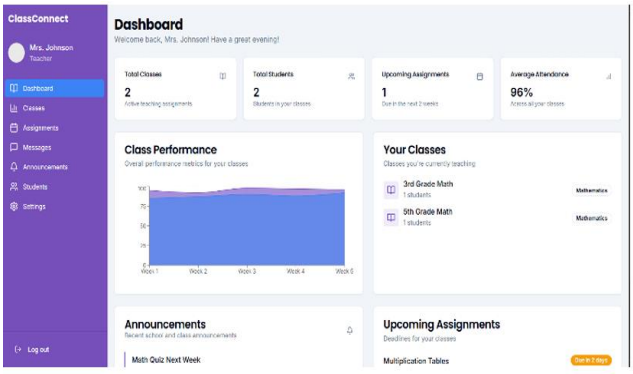

Figure 2 Dashboard for Teacher

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3. Evaluation and Results

The Parental Management System was evaluated through a pilot test conducted in a controlled college environment involving 5 teachers, 10 parents, and 1 administrator. The primary goal of the evaluation was to assess the system's usability, communication effectiveness, and its impact on academic monitoring.

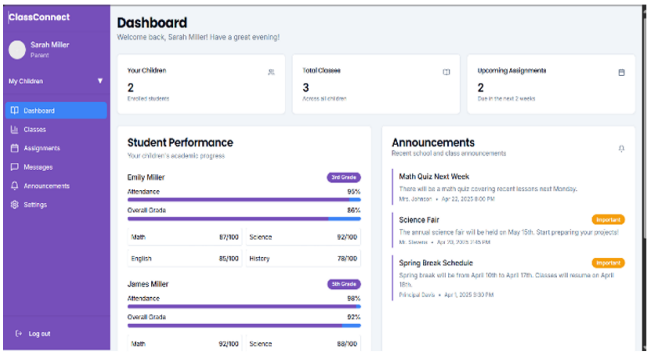

Figure 3 Dashboard for Parent

Feedback was gathered through user surveys and usage logs over a two-week testing period. In terms of usability, more than 90% of users reported that the system was intuitive and easy to navigate. Parents especially appreciated the clean dashboard layout and clear access to relevant student information. Teachers found the process of uploading marks and sending messages straightforward, and administrators were able to efficiently manage users and announcements. The system's integrated messaging feature significantly enhanced communication between teachers and parents. The frequency and quality of interactions improved, with a reported 65% increase in parent-teacher communication compared to previous offline methods. The real-time nature of the platform enabled faster resolution of academic concerns and more immediate feedback. Academic monitoring also showed marked improvement. Parents expressed satisfaction with the real-time visibility into their children's academic performance, including attendance, grades, and fee status. Approximately 80% of the participating parents logged into the system at least once a week, indicating strong engagement and reliance on the platform for academic tracking. Overall, the evaluation demonstrated that the system met its objectives of increasing transparency, improving communication, and involving parents more actively in their child's education, shown in Figure 3 [3].

Conclusion

The Parental Management System bridges communication between colleges and parents by offering real-time access to student data and direct communication with faculty. Built with widely-used web technologies, it is scalable, secure, and user-friendly. This system demonstrates the potential for digital tools to enhance educational engagement and transparency in academic institutions.

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