MNHS LearnHub: An E-Learning System for Muntinlupa National High School

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Chapter 1

INTRODUCTION

PROJECT CONTEXT

This study was conducted at Muntinlupa National High School (MNHS), located in MBP Reservation, Muntinlupa City. The school was selected as the research locale because it is one of the largest public secondary schools in the city and serves as the primary setting for the development and implementation of MNHS LearnHub, an e-learning system designed to support the academic needs of its students.

Many public secondary schools, MNHS faces challenges associated with traditional teaching and learning practices, particularly in monitoring student performance, managing academic records, and supporting blended or remote learning environments. Manual processes in grading, attendance monitoring, and report generation often result in delays, increased workload for teachers, and limited access to real-time academic information for students and parents. These challenges highlight the need for a more efficient and technology-driven approach to learning management.

To address these concerns, the proposed system MNHS LearnHub was developed as a web-based e-learning system tailored specifically for Muntinlupa National

High School. The system aims to provide faster and more accurate tracking of student performance by offering real-time updates and academic insights to teachers, principal, students, and administrators. Through timely access to data, educators can identify students who may be struggling academically and provide early interventions. Students, on the other hand, are given access to interactive learning materials that promote engagement, motivation, and self-paced learning. Additionally, the system automates grading and record-keeping processes, reduces human error, and saves time for teachers. School administrators benefit from organized and reliable academic records that support data-driven decision-making, academic planning, performance evaluation, and reporting. By integrating e-learning and information technology solutions, MNHS LearnHub seeks to modernize the school's educational processes and maximize the benefits of digital learning for sustainable and effective education at Muntinlupa National High School.

PURPOSE AND DESCRIPTION

The system provides a faster and more accurate way of tracking student performance, offering real-time updates. It supports better decision-making by providing timely and relevant data, allowing early intervention for students who may be struggling academically. Additionally, it reduces paperwork and saves time for teachers by automating routine tasks such as grading and record-keeping. The system ensures data security, modernizes school operations, and simplifies the generation of academic reports. It also supports personalized learning by giving students access to tailored learning materials. Furthermore, it promotes accountability, enables effective attendance tracking,

and helps identify behavior patterns and academic trends. The system fosters collaboration among stakeholders—teachers, students and administrators— creating a more efficient, organized, and transparent school environment while reducing the risk of data loss. By improving record accessibility and aiding in the evaluation of teaching effectiveness, the system contributes to a continuous cycle of improvement. Finally, it streamlines the grading process, minimizes administrative errors, and allows performance data to be easily shared for academic assessments and official school reports.

Learners , The learners of Muntinlupa National High School will greatly benefit from the system by having a more accessible and organized platform for their academic activities. Through the system, students can easily access learning modules, receive announcements, submit assignments, and monitor their academic progress. This supports self-paced learning, encourages responsibility, and improves overall academic performance.

Teachers , Teachers will benefit from the system by having a centralized platform for managing their instructional materials, announcements, grading, and student monitoring. The system will help reduce paperwork, save time .It also provides tools for tracking attendance and academic performance, making teaching more efficient and data-driven.

MNHS , As an institution, MNHS will benefit from improved operational efficiency and modernized educational processes. The system supports digital transformation, helping the school keep up with technological advancements in education. It provides accurate

and real-time data for performance monitoring, improves transparency, and simplifies reporting and documentation.

Principal , The system will be very useful for the school principal in terms of monitoring the overall academic and administrative performance of Muntinlupa National High School with more completeness and centrality. Through the system, the principal can monitor student achievement, attendance records, post an events in calendar and school-wide reports all in real time. This therefore provides necessary support to informed decision making, correct policy implementation, and strategic planning. Precisely, it enhances transparency, accountability, and communication within various departments, so that the principal may effectively manage the school's affairs.

Admin , School administrators will benefit from streamlined workflows in monitoring student records, attendance, and academic performance. The system enables quick access to accurate data, which aids in decision-making, policy development, and performance evaluation. It also reduces administrative errors and paperwork, allowing the staff to focus on more critical tasks.

Researchers , The researchers gained valuable knowledge and experience in system development, research writing, and problem-solving. This project also helped them understands the real world application of e-learning system in educational institution

Future Researchers , Future researchers may use this study as a reference or foundation for developing similar educational platforms. The documentation, methodology, and results of this research can provide useful insights into the planning, development, and

implementation of e-learning systems, especially in public school settings. It may also help them identify areas for improvement and innovation.

Company Staff/ Personnel - The Student of Muntinlupa National Highschool will benefits from the system by having a more organized platform for monitoring students' academic, providing announcements, and uploading learning materials efficiently.

OBJECTIVE OF THE STUDY

The main objective of this study is to design, develop, and implement an e-learning system to enhance the teaching and learning process at Muntinlupa National High School.

Specific Objectives

1. The main objective of this project is to develop an interactive and functional elearning system for Muntinlupa National High School. Specifically, it aims to:

A. **Integrate Assessment Tools such as**:

Online quizzes that automatically check student answers and display results.

Interactive activities to reinforce learning concepts.

Timed or scheduled examinations for summative assessments.

B. **Implement a Module Management System that allows**:

Students to download learning modules.

Teachers to upload, update, and organize modules per subject and grade level.

C. **Develop an Interactive Dashboard that can display**:

The total number of users registered in the system.

The number of active users currently engaging with the platform.

The distribution of students per subject.

The number of registered teachers and other relevant data.

D. **Enable Automatic Reports Generation to**:

Generate attendance records.

E. **Facilitate Learner Progress Tracking by**:

Monitoring attendance percentage progress of students.

2. To develop the system using PHP, and MYSQL for the designing database;

3. To test and improved the system using Alpha and Beta Testing method.

4. To evaluate the performance of the system using ISO/ IEC 25010: 2011 Software Characteristics.

5. To implement the system

SCOPE AND LIMITATION

The scope of this study includes the design, development and implementation of "MNHS LearnHub: An E-Learning System", created specifically for Muntinlupa National High School. The system includes features such as user authentication, subject and lesson management, uploading and downloading of learning materials, online quizzes and assessments, attendance monitoring, and academic performance tracking. The system is designed to support and enhance the teaching and learning process across all academic subjects offered at the secondary level, providing a centralized platform for digital learning and academic management.

The platform will be accessible through desktop and mobile web browsers, making it convenient for users without the need for a standalone mobile application. The target users for testing and feedback are selected high school students and teachers from MNHS. The system will be developed using PHP as the programming language and MySQL as the database management system. However, the study is limited to the implementation of basic e-learning features only. It does not include mobile app development, video conferencing, live chat, or integration with external Learning Management Systems (LMS). Evaluation and testing of the system will be conducted exclusively among the selected participants within the school.

CHAPTER 2

REVIEW OF RELATED LITERATURES AND STUDIES

In the current digital age, conventional classrooms are no longer the only setting for successful learning. The advent of technology has revolutionized the education sector, providing new channels for teaching, communication, and evaluation. As schools across the globe respond to contemporary needs, e-learning systems have become vital tools to facilitate blended and remote learning, particularly during and after the COVID-19 pandemic. This chapter provides a literature review and studies that serve as the basis for the creation of MNHS LearnHub: An E-Learning System for Muntinlupa National High School.

This review comprises local as well as foreign literature and research, emphasizing recent innovations in educational technology, characteristics of successful e-learning platforms, as well as challenges encountered during implementation. It further addresses frameworks and standards applicable in the evaluation and design of such systems.

TECHNICAL BACKGROUND

The front-end of MNHS LearnHub was developed using HTML, CSS, and JavaScript, with the integration of PHP for dynamic content and serverside functionality. Development was done in Visual Studio Code (VS Code), a powerful and widely used Integrated Development Environment (IDE) that supports rapid web application development. This combination enabled the creation of a responsive, interactive, and

secure user interface for both students and teachers, ensuring an intuitive learning environment that works well across various web browsers.

For the back-end, the system utilized MySQL as the primary Relational Database Management System (RDBMS). MySQL was chosen for its reliability, efficiency, and compatibility with PHP applications. It handled the storage and retrieval of key data, including user credentials, modules, assessments, and performance records. The database design follows normalization principles to ensure data accuracy and consistency while minimizing redundancy.

To enhance the user interface and experience (UI/UX), the researchers used Bootstrap, a front-end framework that provides pre-designed components and responsive layout utilities. Bootstrap helped maintain visual consistency across different modules of the system while optimizing the layout for both desktop and mobile browsers. Additional custom styling and interaction logic were implemented through JavaScript and CSS to improve usability, visual feedback, and navigation flow.

In terms of hardware and networking, the system was hosted on a local area network (LAN) using a dedicated computer server within the school premises. This setup allowed users to access the system through connected devices over a secure internal network. The deployment also included basic network configuration and IP assignment, ensuring reliable access and data protection. This infrastructure may be upgraded in the future to support cloud hosting for wider access and scalability.

RELATED LITERATURE

Foreign

[1]   Purpose – This paper presents research findings on the effectiveness and impact of ELearning to the teaching and learning process of the Undergraduate Program (UGP) and General Foundation Program (GFP) at Oman Tourism College in Muscat, Sultanate of Oman.

Method – Teacher and student experience on E-Learning were evaluated by utilizing mixed methodology through online survey. Five criteria of effectiveness were established and used to assess E-Learning. The study determined the consensus measure and target

consensus measure of teachers and students on the effectiveness of E-Learning employing the five factors. The study also examined whether students and teachers differ in their perceptions on E-Learning. The effects of E-Learning on teaching methodology and learning styles were also investigated.

[2]   Over the years, technology has become increasingly dominant in every sector of the world, and the impact of digital technology on educational institutions has not been left behind. The concept of "digital education," which entails using technological tools for both learning and teaching in a classroom context, has changed the traditional classroom environment for both teachers and students. In the present era of technological advancements, digital education is essential because it makes learning

efficient through individualized learning, open access to an unlimited amount of information, flexible teaching methods, etc. Digital learning makes it possible for students to communicate and study with a greater variety of materials without having to rely solely on the limited resources available in a traditional classroom setting. Students can study and explore information more easily with the aid of basic digital skills and technology. A student's academic performance and engagement in active learning both improve with a positive attitude and motivation. Digital education has various pros and cons in the teaching environment and its impact on different beneficiaries. Through a literature search, materials from public, educational, and expert sources were obtained. In this chapter, each of these will be explored and conclusions drawn.

[3]   The integration of digital technologies into educational practices has reshaped traditional learning models, creating a dynamic and accessible global landscape for higher education. This paradigm shift transcends geographical boundaries, fostering a more interconnected and inclusive educational environment. This comprehensive literature analysis explores the impact of e-learning on higher education students in the digital era. A meticulous review of 53 studies, sourced from reputable databases including Web of Science, Taylor & Francis, Springer Link, ProQuest, Elsevier, and Scopus, was conducted. Employing the content analysis method, the selected studies spanning from November 2012 to April 2023 were systematically examined. Predominantly utilizing quantitative methods, the studies, largely originating from the

United States, China, Malaysia, and India, focused on university students. Key variables such as student engagement, perception, and academic performance were consistently employed across diverse educational settings. The synthesis of findings revealed that e-learning technologies positively impacted academic achievement, student satisfaction, and collaborative efforts. Moreover, challenges associated with technology usage and internet access were identified, which impact e-learning implementation. The study proposes further investigation through a mixed-methods approach to explore students' interactions with the educational environment while utilizing e-learning technology in institutions of higher education.Ramiz

[4]   Today, online learning is a challenging teaching strategy used by higher educational institutions (HEI) and requires ample technological and psychological preparation. This study aims to assess whether the transition to the virtual classroom improved or deteriorated students' academic performance. Through a systematic literature review, 37 related literatures sourced from Science Direct, Taylor & Francis, and Emerald Insight were obtained. A ten-year timeframe between 2012 and 2022 was used to narrow down the searches. The criteria used for the selection of literature were based on the provided abstract, journal impact factor, and contain the relevant keywords for the study. In this study, four different aspects linked with online learning strategies were noted, namely: technical, technological, psychological, and physical. Findings from this study reveal that online learning strategies are often linked with technical, technological, physical, and psychological elements. Results also show that

students' performance is highly dependent on the presence of these elements during online classes. Furthermore, this study recommends the continued use of online learning if both students and instructors are technologically and physically prepared.

[5]   The high use of web systems in learning implies that e-learning is becoming a common successful learning method in wider academic contexts. In order to enhance and support schooling and literacy, e-learning includes leveraging information and communication technology (ICT). The purpose of the analysis was to determine the correlation between e-learning and the academic achievement of students in higher learning. A set of 150 author's observational studies, carried in Russian educational institutions (both in the period before and during the COVID-19pandemic), was used to measure findings using Cohen's formula focused on a rigorous sampling method. The findings of the equation 0.712) reveal that ICT has a major statistically favorable effect on the academic success of students in Elearning. The results suggest that ICT has a substantial positive effect on the total success of students in universities.

[6]   Purpose-This paper presents research findings on the effectiveness and impact of E-Learning to the teaching and learning process of the Undergraduate Program (UGP) and General Foundation Program (GFP) at Oman Tourism College in Muscat, Sultanate of Oman. Method-Teacher and student experience on E-Learning were evaluated by utilizing mixed methodology through online survey. Five criteria of effectiveness were established and used to assess E-Learning. The study determined

the consensus measure and target consensus measure of teachers and students on the effectiveness of E-Learning employing the five factors. The study also examined whether students and teachers differ in their perceptions on E-Learning. The effects of E-Learning on teaching methodology and learning styles were also investigated. 384 Results-Teachers and students appeared to be in agreement on their perceptions on E-learning and provided higher ratings on E-Learning based on the five criteria of effectiveness. E-Learning was viewed favorably by teachers and students as an effective tool to enhance the delivery of instruction and develop knowledge acquisition skills through transfer of learning. Conclusion-E-Learning can be considered as one of the best strategies to be adopted for teaching and learning. The researchers assert that the provision of education can no longer be restricted within a single campus but can be extended throughout the country through distance learning and integration of E-Learning solutions. Recommendation-It is highly recommended that further study can be conducted to include other Higher Education Institutions in Oman in order to form a more concrete knowledge-based plan in creating E-Learning strategies. Practical Implication-E-Learning could potentially shape the future of education by advancing the traditional classroom setting into the web. There is a need for the entire academic community to ensure that the factors of e-learning effectiveness are delivered adequately and the utilization of e-learning must be evaluated regularly.

[7]   Higher education has recently seen revolutionary changes spurred by technological breakthroughs and a rising desire for adaptive and accessible educational alternatives. E-learning, defined by digital platforms and material distribution across multiple geographical areas, has emerged as a significant breakthrough. This research assesses worldwide e-learning trends in higher education, offering insights into its present condition and influence by evaluating recent advancements, practices, and problems. We used a rigorous theme analysis methodology, which included the collaboration of knowledgeable academics in higher education. To gather relevant data, we meticulously examined blogs using the search filters provided by Google. A threshold value of 0.30 was used to ascertain blogs of considerable importance. The research endeavor resulted in the production of 10 distinct blogs that provide authoritative perspectives. Our study found five notable keywords: accessible learning, blended learning, microlearning, personalized learning, and flexible learning. These observed patterns are consistent with the changing educational environment, which emphasizes the principles of inclusion, flexibility, and student-centered pedagogies. The present study provides valuable insights for decision-making processes, policy development, and instructional design to improve the quality and accessibility of e-learning in higher education.

[8]   The purpose of this study was to examine the relationship between e-learning readiness and academic achievement in an online course in higher-level education. The survey method was employed when collecting the study data, and the

datacollection instrument used was the E-Learning Readiness Scale. The scale comprises 33 items and six sub-dimensions, including (1) computer self-efficacy, (2) internet self-efficacy, (3) online selfefficacy, (4) self-directed learning, (5) learner control, (6) motivation toward e-learning. The study participants comprised 153 freshmen who were taking an online English as a Foreign Language course. A relational model is proposed in this study to measure the predicted levels of readiness on academic achievement in online learning. Reliability analysis, Pearson correlation, linear regression analysis, and structural equation modelling were used to analyze and model the study data. Results indicated that self-directed learning is the strongest predictor of academic achievement, while motivation toward e-learning was found to be another predictor of academic achievement. Internet/online/computer self-efficacy and learner control were not found to be among significant predictors of academic achievement. It is concluded that, especially with the spread of

Covid-19 worldwide, education is currently switching from face-to-face to online learning in an immediate and unexpected way; therefore e-learning readiness has to be carefully taken into consideration within this new educational paradigm.

[9]   Data-driven practices are now crucial in the digital age for streamlining operations and boosting output across a range of industries. With e-Learning emerging as a cutting-edge and promising strategy to improve educational delivery and student engagement, higher education institutions are also adopting this trend. Despite the

potential advantages, e-Learning adoption in higher education is still a developing topic with scant published research.

[10]   Higher education institutions have shifted from traditional face to face to online teaching due to Corona virus pandemic which has forced both teachers and students to be put in a compulsory lockdown. However the online teaching/learning constitutes a serious challenge that both university teachers and students have to face, as it necessarily requires the adoption of different new teaching/learning strategies to attain effective academic outcomes, imposing a virtual learning world which involves from the students' part an online access to lectures and information, and on the teacher's side the adoption of a new teaching approach to deliver the curriculum content, new means of evaluation of students' personal skills and learning experience. This chapter explores and assesses the online teaching and learning impact on students' academic achievement, encompassing the passing in review the adoption of students' research strategies, the focus of the students' main source of information viz. library online consultation and the collaboration with their peers. To reach this end, descriptive and parametric analyses are conducted in order to identify the impact of these new factors on students' academic performance. The findings of the study shows that to what extent the students' online learning has or has not led to any remarkable improvements in the students' academic achievements and, whether or not, to any substantial changes in their e-learning competence. This study was carried out on a sample of University College (UAEU) students selected in Spring 2019 and Fall 2020.

RELATED STUDIES

e-Learning is a key strategy in the course of higher education to improve the results of the educational process and stimulate student motivation. The COVID-19 pandemic imposed on Algerian universities to adopt e-Learning systems to search for effectiveness and efficiency of academic approaches. This paper seeks to remedy these problems by analyzing the impact of e-Learning systems on student motivation and outcomes. A mixed-method approach was used in the data analysis. We conducted the study as a survey, with data being gathered *via* questionnaires distributed to 398 students. The questionnaire includes open questions that were qualitatively analyzed using content analysis with Nvivo, besides Likert scale questions were quantitatively analyzed and modeled using Structural equation modeling (SEM) with Amos to accomplish the path analysis of the research model. The results of the study showed that student motivation (Attention, Relevance, Confidence, and Satisfaction) and student outcomes (knowledge, skills, and attitudes) are significantly affected by e-Learning systems (Technical and electronic requirements, personal requirements, perceived value, and credibility of eLearning). The key findings are discussed, and they provide recommendations for future research.[11].

The pandemic of COVID-19 quickly led to the closure of universities and colleges around the world, hoping that the guidance of social distancing from public health

authorities will help flatten the curve of infection and minimize the overall fatalities from the epidemic. The e-learning framework, however, is the best solution to enable students to learn about the quality of education. The aim of this research was to examine variables reflecting the actual use of the e-learning system during the COVID-19 pandemic among university students. The perceived ease of use and perceived usefulness are positively correlated with facilitating condition, perceived control, and self-efficacy, which in turn influences students' attitude toward use, which in turn affects the actual use of the elearning system during the COVID-19 pandemic. To exam the model on the basis of user data from the e-learning system used collected through an online survey, structural equation modeling (SEM) and path analysis were used. The findings showed that the mindset of students to use had positive effects on the learning of students during the COVID-19 pandemic through the actual use of the e-learning system. In the context of elearning programs in developing countries, previous studies have seldom explored an integrated model. In addition, this article aims to include a literature review of recently published research on the actual use of the e-learning system during the pandemic of COVID-19. [12].

The goal of this study is to develop and verify a model for successful e-Learning based on the experiences of students in the "new normal". From Jordanian universities, 550 students who have taken any e-Learning course were randomly selected. Data were collected via a survey questionnaire, and Structural Equation Modeling (SEM) was employed to test the proposed study model. The findings indicate that contactless learning

and high-quality e-learning systems have a beneficial impact on student satisfaction. In addition, e-Learning cognitive involvement was found to solidify e-Learning satisfaction. Furthermore, the results show a positive and significant impact of e-Learning cognitive involvement and e-Learning satisfaction on e-Learning achievement. Also, e-Learning system quality positively affects e-Learning cognitive involvement, besides a direct impact of contactless learning quality on e-Learning cognitive involvement.[13].

Adaptive e-learning is viewed as stimulation to support learning and improve student engagement, so designing appropriate adaptive e-learning environments contributes to personalizing instruction to reinforce learning outcomes. The purpose of this paper is to design an adaptive e-learning environment based on students' learning styles and study the impact of the adaptive e-learning environment on students' engagement. This research attempts as well to outline and compare the proposed adaptive e-learning environment with a conventional e-learning approach. The paper is based on mixed research methods that were used to study the impact as follows: Development method is used in designing the adaptive e-learning environment, a quasi-experimental research design for conducting the research experiment. The student engagement scale is used to measure the following affective and behavioral factors of engagement (skills, participation/interaction, performance, emotional). The results revealed that the experimental group is statistically significantly higher than those in the control group. These experimental results imply the potential of an adaptive e-learning environment to engage students towards learning. Several practical recommendations forward from this

paper: how to design a base for adaptive e-learning based on the learning styles and their implementation; how to increase the impact of adaptive e-learning in education; how to raise cost efficiency of education. The proposed adaptive e-learning approach and the results can help e-learning institutes in designing and developing more customized and adaptive e-learning environments to reinforce student engagement. [14].

One of the crucial developments in the education paradigm is the rapid growth of Information and Communications Technology (ICT). As a result, most private schools are now at the height of infusing the E-learning system and are seen as one of their advances in the learning management system. Hence, this study tries to look into a way to examine and extrapolate the integration of e-learning system and its correlation to the Junior High School students' study habits and participation. Using a descriptivecorrelation method, the researchers believe in finding a link between and among variables. The study's respondents consist of one hundred and twelve (112) Junior High School students in one private school in the district of Obando, Bulacan, Philippines. The findings of the study indicate that the E-learning system is functional, reliable, usable, and efficient. The level of study habits for high school students is high, and they often participate in class discussions. In addition, a strong link or a significant correlation was observed between the integration of the E-learning system and students' study habits and participation. It is recommended that schools continue to provide teachers with training and skills services to help achieve the adoption of the E-learning framework.[15].

This research used Web-based two-tier diagnostic assessment and Web-based dynamic assessment to develop an assessment-centered e-Learning system, named the 'GPAM-WATA e-Learning system.' This system consists of two major designs: (1) personalized dynamic assessment, meaning that the system automatically generates dynamic assessment for each learner based on the results of the pre-test of the two-tier diagnostic assessment; (2) personalized e-Learning material adaptive annotation, meaning that the system annotates the e-Learning materials each learner needs to enhance learning based on the results of the pre-test of the two-tier diagnostic assessment and dynamic assessment. This research adopts a quasi-experimental design, applying GPAM-WATA e-Learning system to remedial Mathematics teaching of the 'Speed' unit in an elementary school Mathematics course. 107 sixth-graders from four classes in an elementary school participated in this research (55 male and 52 female). With each class as a unit, they were divided into four different e-Learning models: (1) the personalized dynamic assessment and personalized e-Learning material adaptive annotation group (n = 26); (2) the personalized dynamic assessment and non-personalized e-Learning material adaptive annotation group (n = 28); (3) the non-personalized dynamic assessment and personalized e-Learning material adaptive annotation group (n = 26); and (4) the nonpersonalized dynamic assessment and non-personalized e-Learning material adaptive annotation group (n = 27). Before remedial teaching, all students took the prior knowledge assessment and the pre-test of the summative assessment and two-tier diagnostic assessment. Students then received remedial teaching and completed all teaching activities. After remedial teaching, all students took the post-test of the

summative assessment and two-tier diagnostic assessment. It is found that compared to the e-Learning models without personalized dynamic assessment, e-Learning models with personalized dynamic assessment are significantly more effective in facilitating student learning achievement and improvement of misconceptions, especially for students with low-level prior knowledge. This research also finds that personalized eLearning material adaptive annotation significantly affects the percentage of reading time students spend on the e-Learning materials they need to enhance learning. However, it does not appear to predict student learning achievement and improvement of misconceptions. [16].

The effect of e-learning success relies on the learning management system and its effectiveness provided to the learners. As a result, higher education institutions (HEIs) are expanding using various e-learning platforms and focusing on system and information quality. This study adopts the ISS (information system success) model to assess students' perception of e-learning system success (e-LSS).[17].

The COVID-19 pandemic has brought about many changes in all sectors of life, especially in the field of education. These changes aim to make the learning process more effective in the pandemic environment. However, it can be challenging, as some students do not give positive responses to these changes, especially those in remote areas. This article aims to identify and report students' perceptions about the effectiveness of online learning during the COVID-19 pandemic in the remote North Tapanuli region of Indonesia. [18].

The study examines the impact of e-learning platforms on students' interest and academic achievement in Data Structure course. A total of 50 Computer Science students that were taking Data Structure course at tertiary institution level participated in the study. The sample was divided into two major groups: experimental group (n-25) and control group (n-25). The Experimental Group (EG) was taught using an e-learning platform, while the Control Group (CG) was taught using the traditional classroom approach. An achievement test on Data Structure was administered as pre-test and post-test to the two groups. While the hypotheses were tested using ANOVA. The post-test result showed a statistically significant difference between the Academic Achievements of the experimental group and the control group, in favour of the experimental group after the treatment. The mean score of the EG was statistically higher than the CG, showing that the EG outperformed the CG after the treatment. Also, the finding showed that the use of e-learning platforms had a statistically significant effects on the learning interests of the EG after the treatment. Thus, we conclude that the use of e-learning platforms should be encouraged, but the transition has to be gradual to enable the actors understand the new learning strategy, and how to maximize its potentials. [19].

Recognition of user interaction, in particular engagement detection, became highly crucial for online working and learning environments, especially during the COVID-19 outbreak. Such recognition and detection systems significantly improve the user experience and efficiency by providing valuable feedback. In this paper, we propose a novel Engagement Detection with Multi-Task Training (ED-MTT) system which minimizes mean squared error and triplet loss together to determine the engagement level

of students in an e-learning environment. The performance of this system is evaluated and compared against the state-of-the-art on a publicly available dataset as well as videos collected from real-life scenarios. The results show that ED-MTT achieves 6% lower MSE than the best state-of-the-art performance with highly acceptable training time and lightweight feature extraction.[20].

DEFINITION OF TERMS

TECHNICAL TERMS

A. **E-Learning (Electronic Learning)**

A form of education that uses electronic technologies and digital platforms to access curriculum and learning materials outside of a traditional classroom.

B. **Learning Management System (LMS)**

A software application or platform used to plan, implement, and assess a specific learning process. It supports documentation, tracking, reporting, and delivery of educational courses.

C. **User Interface (UI)**

The visual part of the e-learning system through which users interact with the software, such as buttons, menus, and content layouts.

D. **User Experience (UX)**

Refers to how users feel when interacting with the e-learning system, including aspects like ease of use, accessibility, and engagement.

E. **Web-Based Application**

A software or program that runs on a web server and is accessed through a web browser using the internet.

F. **Frontend Development**

The part of web development that involves building the visible parts of the application (e.g., ASP JavaScript , Laravel).

G. **Backend Development**

Refers to server-side programming and database management, which powers the core functionality of the application (e.g., using PHP and MySQL).

H. **Database Management System (DBMS)**

Software that stores and retrieves users' data efficiently. In your case, MySQL is used to manage user accounts, content, and records.

I. **Modules**

Components or sections of the e-learning system that separate functionality such as student login, teacher dashboard, quiz system, or learning content.

J. **Authentication**

A security process that ensures users are who they claim to be—usually done through usernames and passwords.

K. **Responsive Design**

A design approach that ensures the system is usable and looks good on different screen sizes and devices (e.g., desktops, tablets, smartphones).

L. **Bootstrap**

A front-end development framework used for designing responsive and mobilefirst websites.

M. **MySQL**

An open-source relational database management system used to store and manage the application's data.

N. **Content Management**

The process of creating, organizing, and delivering digital educational materials such as lessons, quizzes, and resources.

OPERATIONAL OF TERMS

1. **E-Learning System**

An e-learning system refers to the use of electronic technologies to access educational curriculum outside of a traditional classroom setting. The system includes features for managing course materials, tracking student progress, and facilitating communication between teachers and students, typically via the internet.

2. **User Authentication**

User authentication is the process of verifying the identity of a user attempting to access the system. This is done through usernames and passwords to ensure that only authorized individuals can interact with the platform.

3. **Module Uploading**

Module uploading refers to the feature that allows Teachers to upload digital learning materials (e.g., PDF files, PowerPoint presentations, videos) to the platform for student access.

4. **Performance Tracking**

Performance tracking is a system feature that monitors and evaluates students academic progress, including quiz scores, assignment results, and attendance records.

5. **Announcements**

Announcements can be seen on the dashboard posted by principal or administrators to inform users of important events, class schedules, deadlines, or school-related updates.

6. **Database System**

A database system is the software that manages the storage and retrieval of information such as student data, learning modules, grades, and user credentials. In this study, MySQL is used as the database management system.

7. **Interface Design**

Interface design is the process of designing the layout, navigation, and visual appearance of the e-learning system to ensure it is user-friendly for both students and teachers.

8. **Grading Automation**

Grading automation refers to the system's capability to automatically calculate and record student grades based on their quiz or assignment submissions.

9. **User Experience (UX)**

User experience describes the overall feeling and satisfaction a user gets when interacting with the system, focusing on ease of use, accessibility, and functionality.

10. **Blended Learning**

Blended learning is a teaching approach that integrates traditional classroom instruction with online learning methods to provide a flexible educational experience.

11. **Real-Time Updates**

Real-time updates refer to the instant reflection of changes made within the system, such as newly uploaded materials, posted grades, or announcements.

12. **Data Privacy and Security**

Data privacy and security include practices and technologies that protect sensitive information (such as student records) from unauthorized access or breaches.

13. **Content Management System (CMS)**

A content management system is the tool used by teachers or admins to upload,

edit, organize, and manage digital learning materials within the platform.

CHAPTER 3

METHODOLOGY

This chapter discusses the systematic approach followed in the development of the MNHS LearnHub: An E-Learning System for Muntinlupa National High School. It details the methodology used, requirement gathering and analysis, system design, development, testing, and implementation plan.

Requirements Analysis

To understand the specific needs of Muntinlupa National High School (MNHS), the researchers conducted an analysis of the current learning system and processes. Interviews with faculty members and IT personnel, as well as classroom observations, were conducted to assess how educational content is currently delivered and how students' academic performance is tracked.

At Muntinlupa National High School, the current learning environment is heavily dependent on manual processes. Teachers are responsible for preparing printed modules, creating quizzes, and recording student grades by hand or through spreadsheet programs such as Excel. Students, on the other hand, receive these printed modules during face-toface sessions or designated distribution days, and they are required to manually complete and submit their outputs. School administrators oversee class scheduling, monitor module distribution, and compile academic performance data manually, often

without the aid of a centralized digital system. The school's IT staff have limited involvement in the academic workflow and are primarily tasked with basic hardware setup and occasional troubleshooting.

The core academic activities at the school include instruction delivery, assessments, and monitoring of student performance. These are currently carried out using physical materials, in-person sessions, and manual grade recording. There is no unified digital platform to support the streamlined management of these tasks. All learning and teaching processes take place within the school premises. Modules are distributed physically, and grades are computed manually, either on paper or using basic spreadsheet tools. Communication between teachers and students is mostly done through bulletin boards or informal messaging apps, which often leads to gaps in information delivery.

The manual system involves teachers creating and printing modules, distributing them in class, and students physically returning their outputs. Teachers then manually evaluate the submissions and compute the grades using Excel or handwritten records. Important announcements are delivered through bulletin boards or group chats, which are inconsistent and often ineffective. With no centralized system to store and monitor data, performance tracking and report generation become tedious and prone to errors.
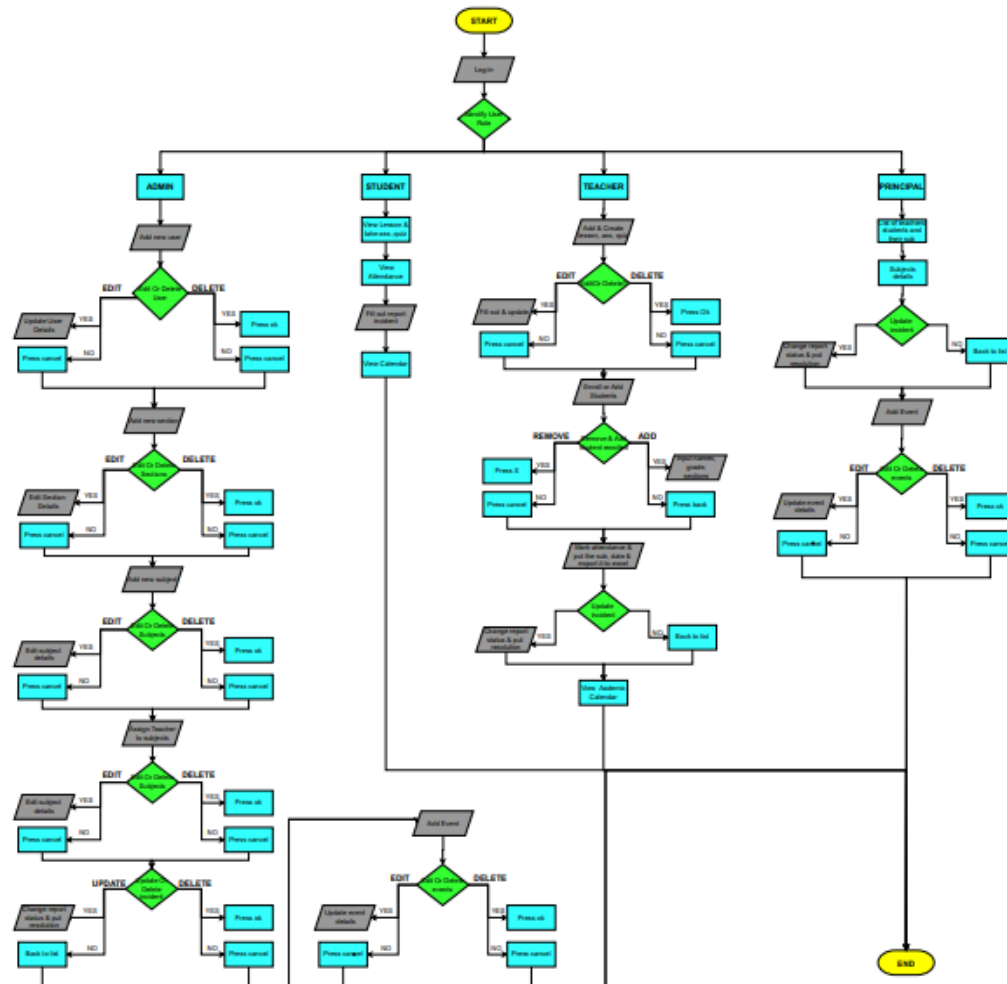
Figure 1. Flowchart of the current system

Flowchart of the proposed system from login to system exit. After the user logs in, the system identifies the user role and redirects the user to the appropriate module: Admin, Student, Teacher, or Principal.

The Admin manages user accounts and system records through adding, editing, updating, and deleting also admin can add an events in calendar.

The Student can view lessons,grades and answer quizzes, assignments, also student can look at the announcements on the dashboard, and can report an incident then view the academic calendar.

The Teacher handles academic tasks such as upload and create a lessons,assignments,quizzes, delete a student user or add,updating incident status reports, and viewing the calendar.

The Principal oversees the system by viewing reports, managing events, and viewing teachers handle subjects and their list of their students

All actions pass through decision processes to ensure correctness and security. The system ends once the user completes their tasks.

REQUIREMENT DOCUMENTATION

To address these issues, the researchers propose the development of "MNHS LearnHub: An E-Learning System", a web-based platform designed to modernize and improve the teaching and learning experience at Muntinlupa National High School. The main objective of this system is to design, develop, and implement a centralized and userfriendly e-learning platform.

The system will include secure user login and authentication features to ensure data privacy and controlled access for students, teachers,principal and administrators. Teachers will be able to upload and organize modules and learning materials directly within the system, making them easily accessible to students anytime through desktop or mobile web browsers. The platform will also allow principals and administrators to send announcements, replacing physical bulletin boards and fragmented communication tools.

An online quiz and assessment feature will be included, allowing automatic scoring and real-time feedback to students. The system will also enable performance tracking by displaying student progress, scores, and attendance history, helping teachers identify areas for intervention. For administrators, the system will include management tools for monitoring classes, users, and academic trends. Automated grading and report generation features will significantly reduce paperwork and save time.
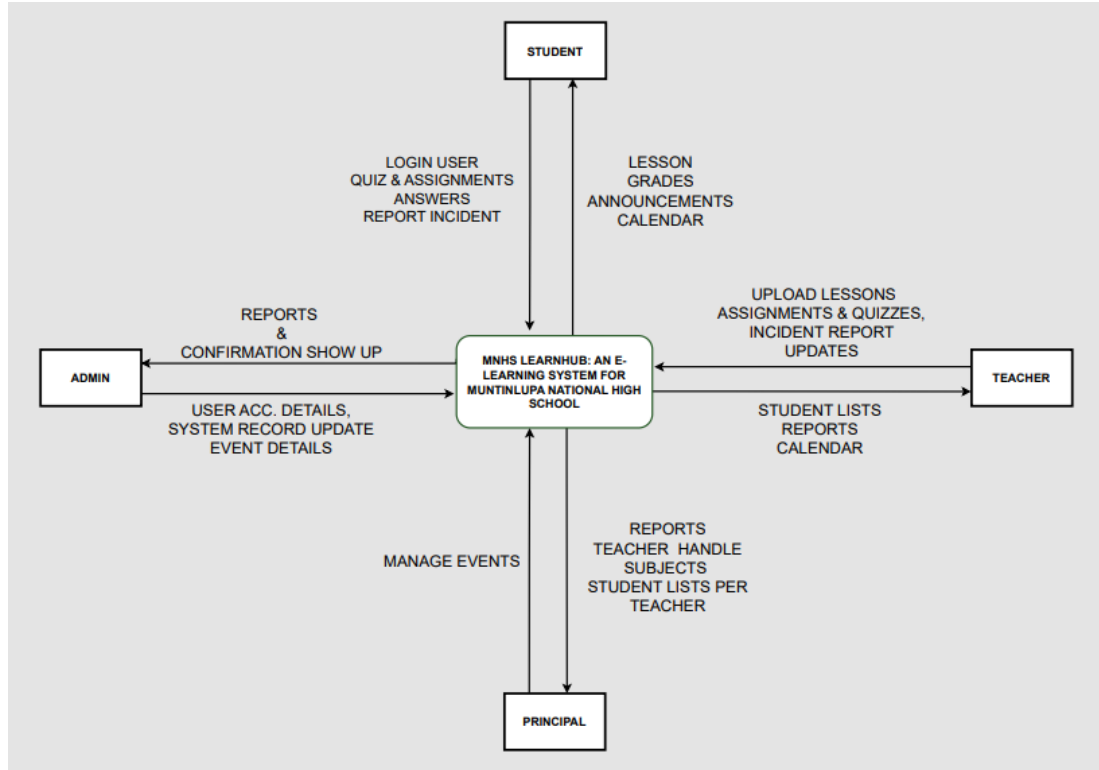
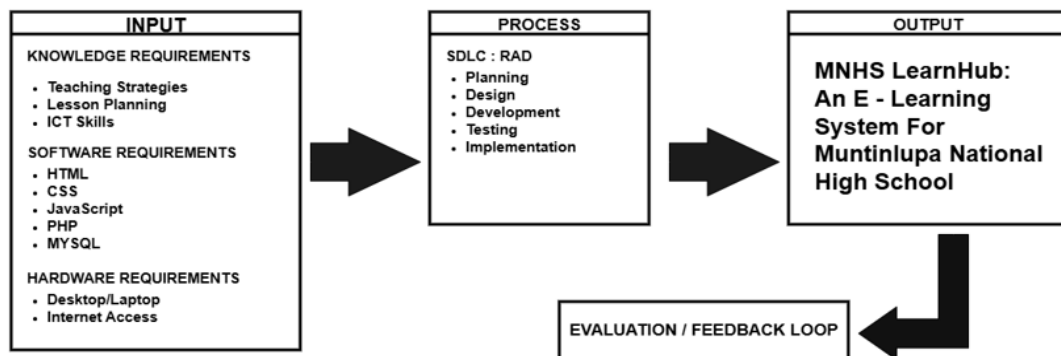**Figure 2.** Context Diagram of the proposed system:

MNHS LearnHub: An E-Learning System for Muntinlupa National High School

Figure 2 shows how the MNHS LearnHub system functions. Based on this diagram , after logging in, the system recognizes their roles in order to offer corresponding functions. Admin deals with the system's infrastructural features (users, sections, subjects),the Teacher enables learning through the uploading of educational contents as well as responding to incident reports, Students can view subjects and grades in addition to submitting quizzes and assignments also an incident reports, Lastly, the Principal can view all school-based reports as well as event calendars.
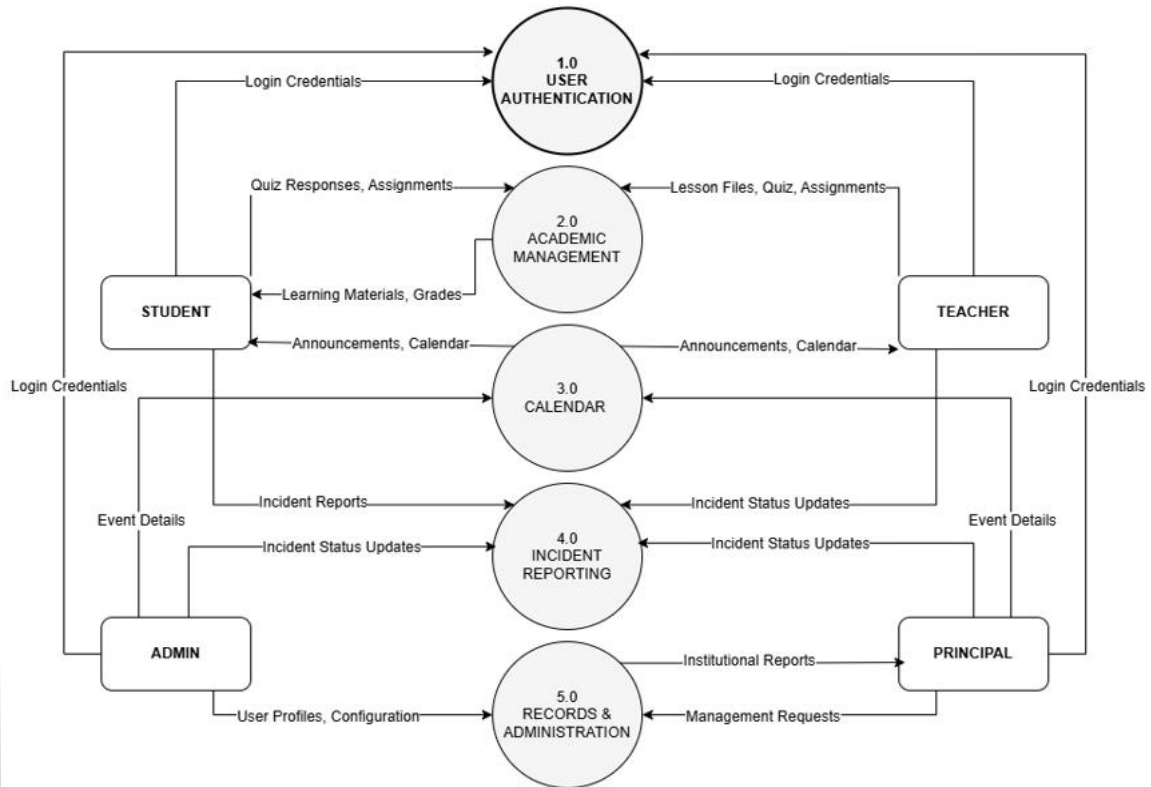
Figure 3. Data Flow Diagram of the proposed system: MNHS LearnHub: An E-

Learning System for Muntinlupa National High School

Figure 3 illustrates the Data Flow Diagram (DFD) of the proposed system, MNHS

LearnHub. The system begins with User Authentication (1.0), which serves as the secure

gateway for all roles to access the platform. Academic continuity is maintained through

Academic Management (2.0), where teachers distribute materials and students submit

assessments, while Calendar (3.0) synchronizes schedules and announcements across the

institution. The diagram also highlights specialized administrative workflows: Incident

Reporting (4.0) manages the lifecycle of school-related issues from reporting to status

updates, and Records & Administration (5.0) facilitates high-level governance by

allowing Admins to configure user profiles and providing Principals with essential institutional reports and management tools.
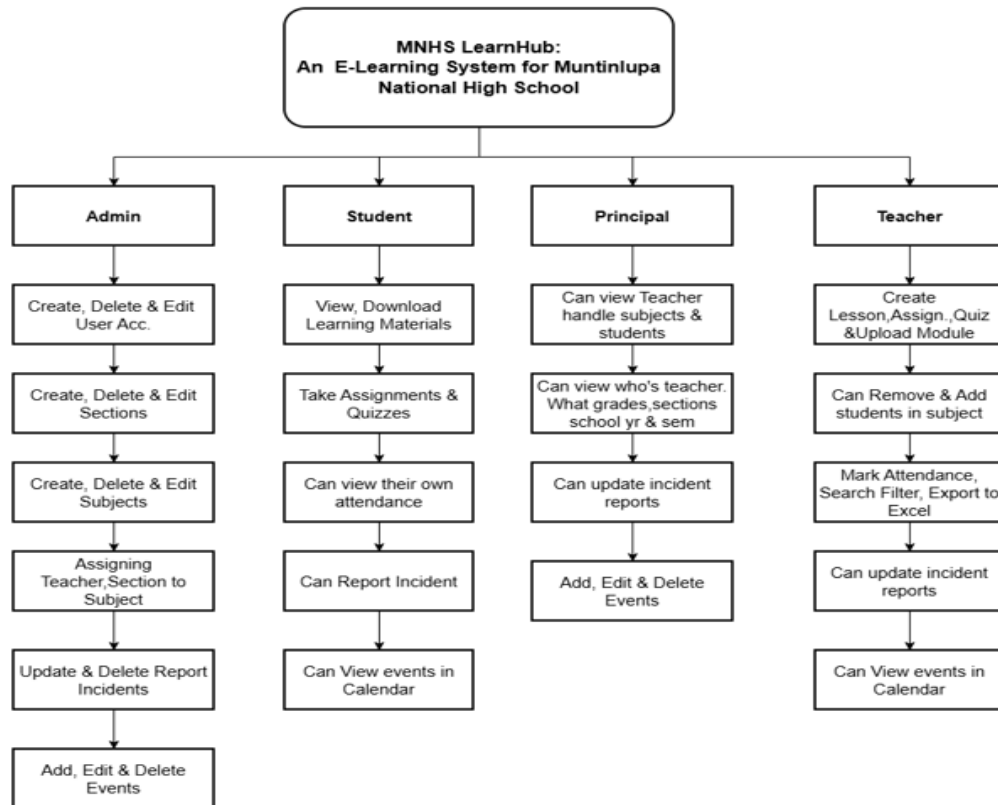
Figure 4. Functional Decomposition diagram of the proposed: MNHS LearnHub: An E-

Learning System for Muntinlupa National High School

Figure 4 presents the functional decomposition diagram for the proposed MNHS LearnHub: An E-Learning System for Muntinlupa National High School. This diagram breaks down the primary roles and their corresponding functionalities within the system,

providing a clear overview of how the system operates and how each user group contributes to its effectiveness

Design of Software, System, Product, and/or Process

This chapter outlines the conceptual framework and system architecture of the developed application. The conceptual framework of MNHS LearnHub provides a structured view of how users interact with the system, how data flows between components, and how learning content is managed. The model used for this framework follows the Input–Process–Output (IPO) model to highlight how data is entered, processed, and returned as useful learning materials and records.

Figure 5. Conceptual Framework of the proposed system: MNHS LearnHub: An ELearning System for Muntinlupa National High School

Figure 5 The conceptual framework illustrates how the MNHS LearnHub e-learning system is developed and improved through a structured flow of inputs, processes, and

outputs. The inputs represent the essential requirements needed to build the system, including the teachers' knowledge and skills (teaching strategies, lesson planning, and ICT competence), the necessary software tools (HTML, CSS, JavaScript, PHP, and MySQL), and basic hardware and internet access. These inputs are transformed during the process stage, where the system is developed using the Rapid Application Development (RAD) model, which involves planning the system, designing its features, developing the actual platform, testing its functionality, and implementing it for use. The output of this process is MNHS LearnHub, an e-learning system created specifically for Muntinlupa National High School to support online learning and academic monitoring. Finally, the evaluation and feedback loop ensures continuous improvement by collecting feedback from users, identifying issues or needed enhancements, and feeding this information back into the system development process to maintain effectiveness and relevance.
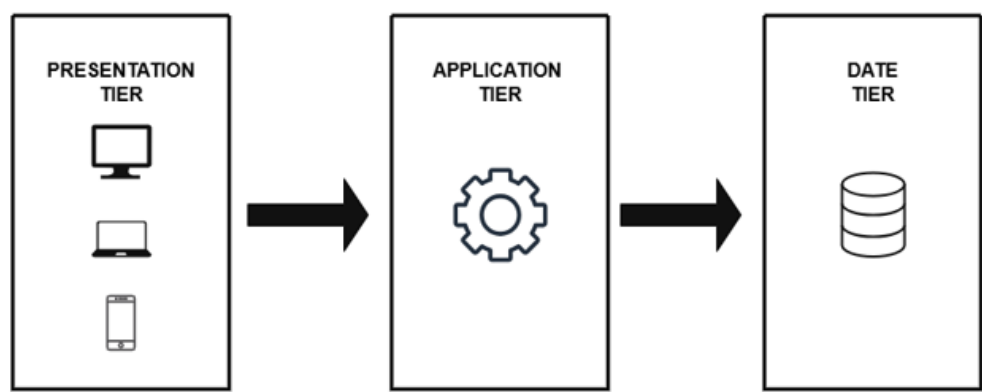
Figure 6. system architecture diagram, of the propose system: MNHS LearnHub: An ELearning System for Muntinlupa National High School

Figure 6 shows the system architecture diagram, which illustrates the components and flow of data between the front-end, back-end, and database. It serves as the foundation for how the system is built and interacts with its users.

Frontend Interface

Built using HTML, CSS, JavaScript, and Bootstrap, the front-end serves as the primary interface for students, teachers, and administrators. It allows users to:

- Navigate the dashboard
- Upload/download learning materials
- Take quizzes
- Monitor academic progress

Backend Services

The back end is powered by PHP, which serves as the server-side scripting language responsible for the following functions:

- User authentication and role-based access control
- Implementation of business logic for quizzes, submissions, and progress tracking
- Server-side data processing and communication between the front end and the database

Database Integration

MySQL is used for data storage. It contains:

- User accounts and roles

- Lesson content and quiz items

- Student grades and activity logs

Forms and Input Modules

These forms allow teachers to input new content (e.g., lessons, quizzes), and students to submit activities. Validation checks ensure input quality before data is saved.

Reporting Module

Admins and teachers can generate reports on user activity, quiz performance, and system usage to support data-driven educational decisions.

DEVELOPMENT AND TESTING Development Procedure

Rapid Application Development (RAD) was the chosen methodology for the development of MNHS LearnHub: An E-Learning System for Muntinlupa National High School. RAD is particularly effective for projects requiring quick turnaround, user collaboration, and adaptive development—a perfect match for educational systems where feedback from teachers and students is essential. This approach prioritizes speed, iterative

prototyping, and continuous user feedback over rigid planning, making it ideal for the academic setting of MNHS.
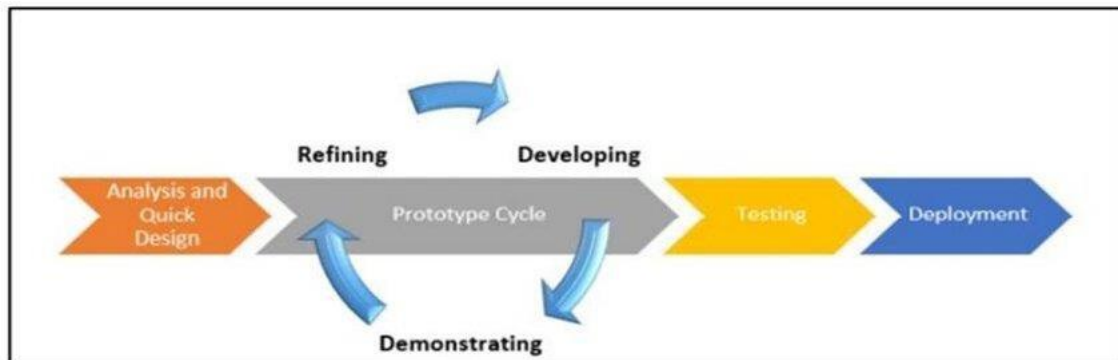
Figure 7. Rapid Application Development (RAD) Model
(Source: ResearchGate)

Figure 7 illustrates the RAD model used in this study. Unlike the traditional waterfall model, RAD enables flexible, user-centered development through repeated cycles of development, testing, and refinement. It allowed the team to incorporate real-time feedback from both students and teachers, ensuring the system meets user expectations and academic needs.

While RAD shares similarities with Agile methodologies, such as iterative development and stakeholder involvement, it places stronger emphasis on rapid prototyping and toolbased development, which helped speed up the delivery of functional modules like quiztaking, lesson uploads, and grade tracking in MNHS LearnHub.

Phase 1: Analysis and Design

This initial phase involved gathering requirements from key stakeholders—school administrators, teachers, and students—through interviews and surveys. The system was designed to support essential academic functionalities such as:

- Student access to learning modules and quizzes,

- Teacher content management,

- Admin monitoring and reporting.

Using RAD, analysis and design were intertwined, allowing for rapid feedback and adaptation. Instead of a long planning phase, wireframes and early prototypes were developed and validated immediately with target users.

Phase 2: Develop, Demonstrate, Refine

In this phase, the core modules of the system—student dashboard, quiz system, lesson upload, and admin panel—were developed using:

- **Front-End:** HTML, CSS, JavaScript

- **Back-End:** PHP

● **Database:** MySQL

Prototypes were shown to teachers and students to gather feedback. Based on their input, features like user-friendly navigation, quiz feedback, and assignment tracking were refined. This cycle was repeated until all core features met user expectations.

Phase 3: Testing

Testing in RAD is not a one-time process but an ongoing activity. Each prototype underwent:

Unit Testing – Conducted by developers to ensure individual functions (e.g., login, quiz submission) worked as expected.

Integration Testing – Verified that all system components (e.g., student and teacher modules) worked together seamlessly.

System Testing – Simulated usage within a school LAN setup to ensure reliability.

User Acceptance Testing (UAT) – Teachers and students tested the system to validate ease of use and relevance to their academic needs.

Bugs and usability concerns were logged and resolved in subsequent iterations.

Phase 4: Implementation

Unlike traditional models with a single final release, implementation in RAD is continuous. As soon as a stable prototype was ready, it was deployed in a test environment for real-time use by selected users. Feedback from this live interaction further shaped the development of the next version.

The final version of MNHS LearnHub was deployed after a cycle of continuous improvements, ensuring it was user-approved, functionally stable, and academically relevant. Implementation was not a final step, but an ongoing integration of system improvements until all key stakeholders were satisfied.

Implementation Plan

The system was deployed on a **Local Area Network (LAN)** within the school using a dedicated computer server. The plan included:

- Installation of the system on a secured LAN server.

- Configuration of IP settings for access via student and teacher devices.

- User orientation and system training for faculty members.

- Gradual rollout starting with selected grade levels.

- Monitoring usage and collecting feedback for post-deployment improvements.

The implementation schedule was phased over a month to allow adjustments based on real-time feedback.

Testing Procedures

Table 1 Testing Procedures

Component / Module	Test Conducted
Login Panel	Login as Admin Login as Teacher Login as Student
User Interface	Load speed of dashboard and modules Navigation responsiveness Design consistency and readability
Content Access	View lessons uploaded by teachers Access and submit quizzes Preview/download uploaded materials
Teacher Module	Upload lessons and quizzes Check and grade student submissions and mark attendance
Student Module	View enrolled subjects Take quizzes and see attendance progress

Admin Panel	Add/edit/remove users ,Monitor platform usage
Principal Module	View Teacher handle subject and student lists; Review Incident Status Updates
Database Integration	Verify data is saved accurately Confirm user role-based access Ensure quiz results and activity logs are recorded correctly

Table 1. Testing procedures were guided by ISO 25010:2011 software quality characteristics such as functionality, usability, performance, and reliability.

The process begins with Login Panel verification to ensure secure, role-based access for Admins, Teachers, Students, and Principal role. While the User Interface and Content Access tests focus on technical performance and material availability, the Teacher and Student Modules validate the core academic exchange of quizzes and grades. Crucially, the Principal Module is tested to confirm executive oversight, allowing the user to monitor teacher subject lists, review Incident Status Updates. Finally, Admin Panel and Database Integration tests ensure that all user configurations and activity logs are accurately recorded and that role-based permissions are strictly maintained throughout the system.

Table 2 Likert Scale

Scale	Range of Mean Value	Interpretation
5	4.51 – 5.00	Strongly Agree
4	3.51 – 4.50	Agree
3	2.51 – 3.50	Neutral
2	1.51 – 2.50	Disagree
1	1.00 – 1.50	Strongly Disagree

Table 2. This Likert scale was used by evaluators (teachers, students, and admins) to rate the features and usability of MNHS LearnHub.

Table 3 Comparison Between Existing Learning Platforms and MNHS LearnHub

Feature	Google Classroom	MNHS LearnHub
Upload lessons and quizzes	✓	✓
Student progress tracking	✓	✓
Role-based account access	✓	✓
Admin panel for reports	✗	✓

Designed for MNHS-specific grading system	✗	✓
Incident Reporting	✗	✓
Automated Grading System	✗	✓

Table 3. Shows the improvements and advantages of MNHS LearnHub compared to common platforms like Google Classroom. LearnHub was built with features tailored specifically for MNHS faculty and students.

IMPLEMENTATION PLAN

Table 4 Implementation Plan

After revisions and final testing, the MNHS LearnHub system will be presented to Muntinlupa National High School for adoption. Should the school approve the system, it will be officially handed over along with the documentation and training materials. A memorandum of understanding will be signed indicating that the school will take full responsibility for maintenance and future updates.

Strategy	Activities	Persons Involved	Duration

Approval from School Administration	Formal letter and system presentation	Researchers, School Head, ICT Coordinator	1 day
System Deployment	Installation in the school's local server or web host	Researchers, ICT Coordinator	1 day
Orientation and Information Campaign	Announcement via school Facebook page and advisory bulletin	Admin, Teachers, Students	1-3 days
Hands-on Training	Lecture and demo sessions on how to use the system	Researchers, Teachers, Students	2-4 days
Feedback and Evaluation	Collection of suggestions and final adjustments	Teachers, Students	2 days

Table 4. The Implementation Plan outlines a five-stage strategy to transition the MNHS LearnHub from a researched project to a fully operational school tool. The process begins with Administrative Approval, where a formal presentation is made to the School Head and ICT Coordinator to secure official adoption. Once approved, System Deployment takes place over one day, involving the technical installation of the platform onto the school's local server or web host. This is followed by an Orientation and Information Campaign lasting one to three days to announce the system to the community via social media and bulletins. To ensure user competency, a Hands-on Training phase of two to four days provides live demos and lectures for teachers and students. Finally, a two-day

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Feedback and Evaluation period allows for final adjustments based on user suggestions before the system is officially handed over through a memorandum of understanding.

CHAPTER 4

RESULTS AND DISCUSSION

A.Project Description

MNHS LearnHub is a web-based e-learning system developed for Muntinlupa National High School (MNHS). The system was designed to support blended and online learning by providing a centralized platform for managing learning materials, student activities, assessments, and communication between teachers and learners. MNHS LearnHub serves as a digital learning environment that enhances accessibility to educational resources and promotes continuity of learning inside and outside the classroom.

The system allows teachers to upload learning modules, quizzes, assignments, and other instructional materials, while students can access lessons, submit outputs, and monitor their academic progress. Principal can see a teacher handle subjects and student lists and also can add an events. Administrators are responsible for managing user accounts, monitoring system usage, and ensuring the smooth operation of the platform.

MNHS LearnHub was developed using web-based technologies, ensuring accessibility through commonly used browsers such as Google Chrome, Mozilla Firefox, Microsoft Edge, and Opera. The system is intended to improve learning efficiency,

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organization of instructional content, and interaction among members of the school community.

B.Project Structure

MNHS LearnHub is composed of several interconnected modules designed to support digital learning, student performance tracking, and administrative efficiency within the school. These modules function together to ensure a centralized, organized, and user-friendly system for students, teachers, and school administrators.

a.   User Management - This is the User Management interface for the MNHS ELMS (Electronic Learning Management System). This dashboard serves as a central hub for administrators to oversee all accounts registered within the system.

Figure : User Management Module

- User Management Module

  o In this module a search bar allows admins to find users by name, email, or phone. There are also category buttons to filter the list by role: Administrator, Principal, Teacher, or Student.

  o It also includes delete and edit user details button.

   o Only administrators can add a user.

b. **Subject Management -** the Admin Dashboard serves as the primary control center for creating, editing, and deleting academic subjects, also assign teacher every subject which must be finalized before they appear on the teacher subjects handle. Once a subject is active, the Teacher Dashboard enables educators to manage subject details by first creating a lesson.

Subject Managing is divided into two parts; the admin subject managing and teacher and subject assigning.

Figure :Admin Subject Managing

- Admin Subject Managing

  o In this module admin can add new subject and input the subject details.

  o It also includes delete and edit the subject details button.

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Figure : Teacher and subject Assigning

- Teacher and subject Assigning

  o In this Module this is the primary button used to establish a new topic container; it must be clicked first before any learning materials or activities can be added.

o Edit & Delete: In the subject catalog you can delete and edit a subject and the same goes for subject assignments.

c. **Handle Subjects/Students-** Teacher Directory viewed from a Principal User's perspective. The main content area displays a structured table listing teacher names, email addresses, the number of subjects they are currently assigned, and their account status. Each entry includes a prominent "View Details" button, allowing the principal to look teacher subjects and students name and their enrolled subjects .

Figure : Handle Subjects and Students

d. **Teacher Module Figures -** Teacher Module provides a centralized platform for managing the subject through a tabbed navigation system that allows educators to switch seamlessly between Modules, Assignments, and Quizzes. Specifically, the Assignment and

Quiz management views function as comprehensive tracking dashboards where teachers can initiate new tasks via the "Create Assignment" and for quiz "Create Quiz" button. To ensure full administrative control, each entry includes integrated tools to Edit or Delete content, as well as a "View Submissions" feature.

Teacher Module Figures is divided into three parts; the Lesson/Module Upload Interface, Quiz Creator and Assignment creator.
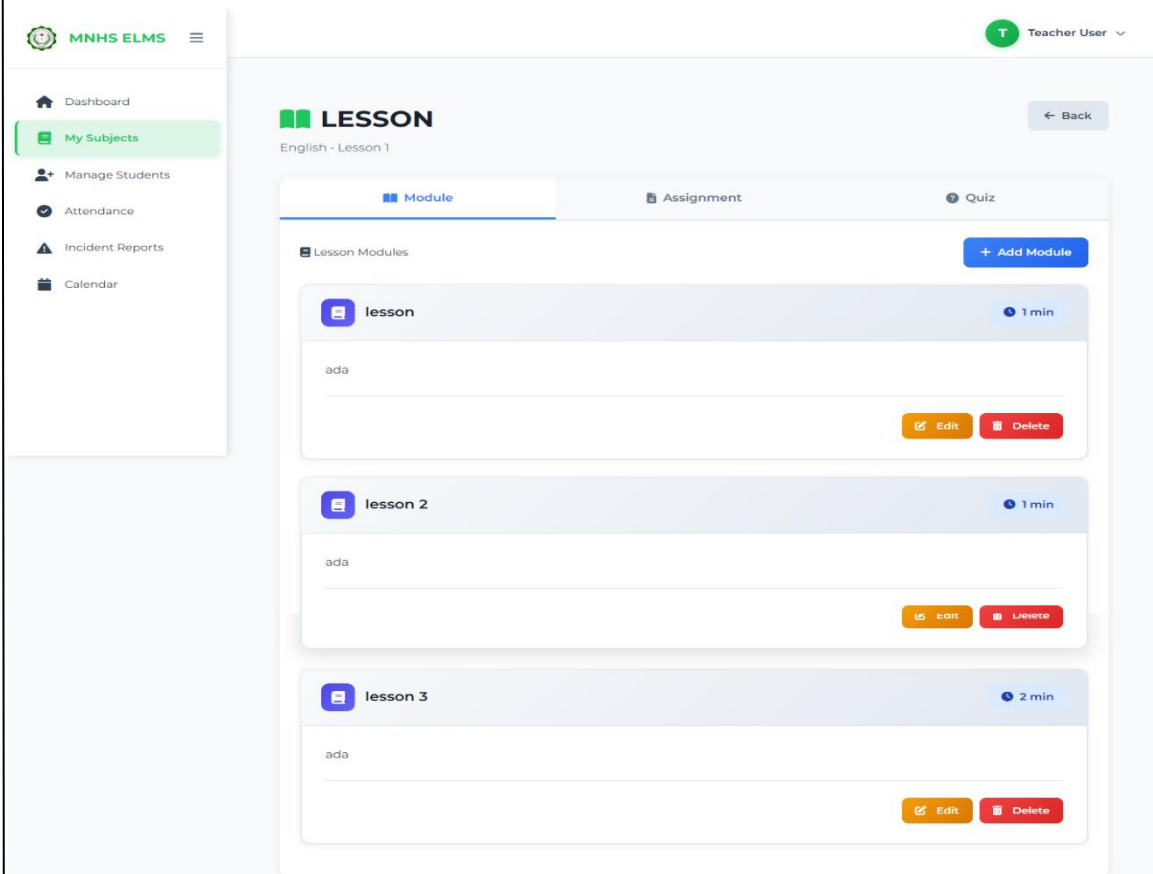
Figure : Lesson/Module Upload Interface

- Lesson/Module Upload Interface

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o Add new Lesson/Module: In this figure by selecting the "Add Lesson" function and subsequently the "Add Module" button, teacher needs to input details and upload the required module files.

o It also includes delete and edit the lesson details button.

o

Figure : Assignment Creator

- Assignment Creator

o In this Module, by selecting "Create Assignment" button teacher needs to put the details and also upload the file.

o It also includes delete and edit the assignment details button.

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Figure : Quiz Creator

- Quiz Creator

  o In this Module, by selecting "Create Quiz" button teacher needs to put the details and make an questions for quiz.

  o It also includes delete and edit the quiz details button.

e.   Student Portal Figures - The Student Dashboard functions as the primary hub, providing a concise overview of enrolled subjects, attendance rates, and pending assignments to help students stay organized. Through the Learning Module Viewer, students can access specific course content and download lesson materials for study. Finally, the Examination/Quiz Interface provides a streamlined environment for completing assessments, allowing students to engage with the "Take Quiz" feature to demonstrate their subject mastery.

Student Portal Figures is divided into three parts; the Student Dashboard, Module Downloading and Quiz Interface .

Figure : Student Dashboard

- Student Dashboard

    o In this Module student can see Enrolled Subjects, Attendance Rate, and the total count of Pending Assignments.

    o It also includes Announcements, My Classes, and Upcoming Events to ensure students stay informed about school updates and scheduled activities it also have

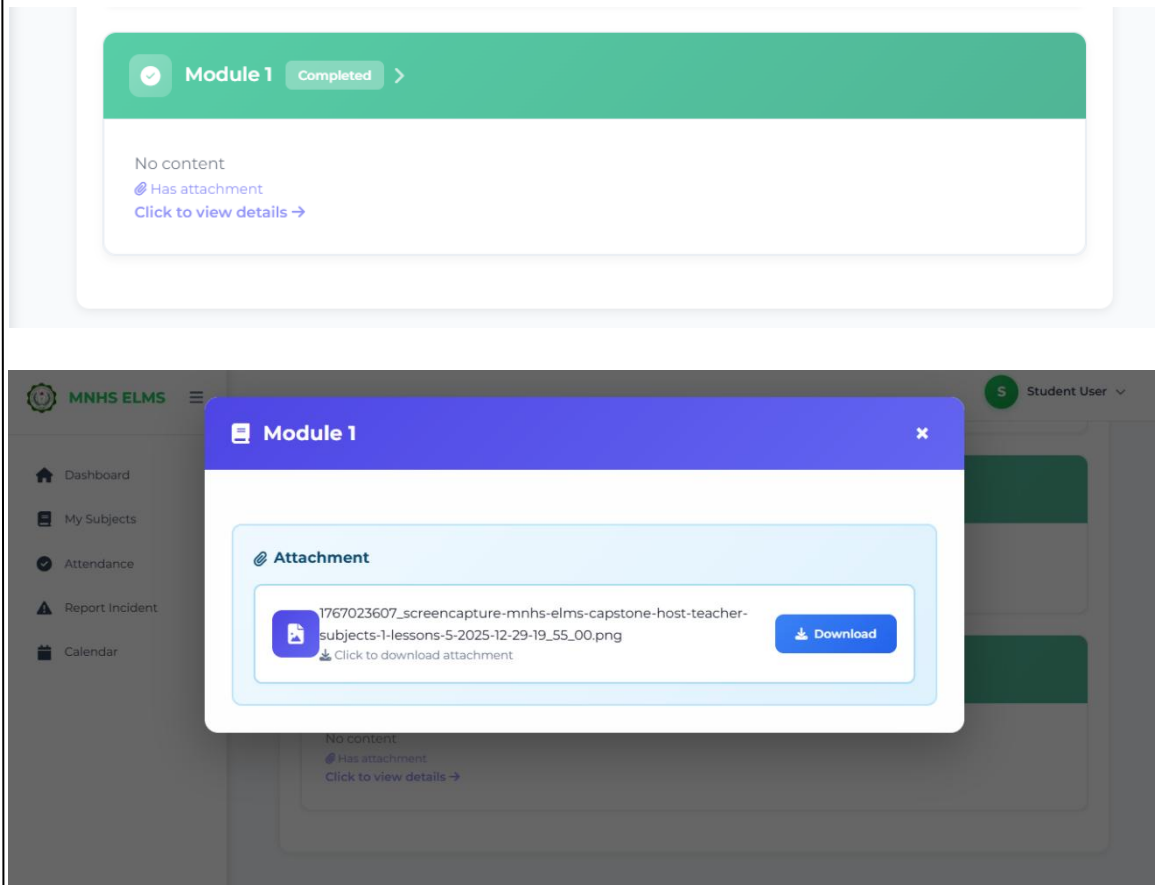Recent Quizzes and Recent Grades allow students to monitor their progress and view scores immediately.

Figure : Module Downloading

- Module Downloading
  - o In this Module first the student user needs to start a lesson and they will see a "Click to view details" and it will show the module file and the user can download it.

Figure : Quiz Interface

- Quiz Interface

  o In this Module there's three tabs and student needs to click the quiz and click "Take Quiz" and submit it then the it will automatic show the student score.

f. Attendance Management - the Attendance Management system allows teachers to efficiently record and track student presence through dedicated Marking and Reporting interfaces. The marking dashboard features Quick Actions to mass-assign statuses such as

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"Mark All Present," while the reporting view enables educators to use Filter Options—including subject, start date, and end date—to generate precise summaries and Export to Excel for administrative use. Together, these tools provide a structured data log of student names, dates, and attendance statuses, ensuring accurate monitoring of classroom engagement.

Attendance Management is divided into two parts; the Mark Attendance, and Search/Filter Reports

Figure : Mark Attendance

- Mark Attendance

    o This interface utilizes Quick Actions to mass-assign statuses such as "Mark All Present," "Mark All Absent," or "Mark All Late," while allowing for individual status updates and custom remarks for each student.

Figure : Search/Filter Reports

- Search/Filter Reports

    o In this Module Search/Filter Reports, this section enables educators to use Filter Options—including subject and date ranges—to Generate Reports, view

specific status summaries (Present, Absent, Late), and Export to Excel for administrative documentation.

C. Project Capabilities and Limitation

In the capstone project entitled "MNHS LearnHub: An E-Learning System for Muntinlupa National High School," we, the researchers and developers, designed and developed the web-based application to modernize the delivery of educational resources and streamline administrative workflows within the institution. The project was created to address persistent challenges in the school's traditional system, including the difficulty of centralizing learning modules, the manual and time-consuming process of recording student assessments, and the lack of a real-time tracking system for student attendance and progress. Guided by the objectives of the study, the MNHS LearnHub was built using the PHP programming language and MySQL for robust database management, ensuring a structured and reliable environment for academic data.

The system integrates key modules such as User Management for secure role-based access, Module Management for the organized distribution of lessons, and Automated Assessment Tools that feature timed examinations and instant checking to improve instructional efficiency. Furthermore, the platform includes specialized functions like Incident Reporting for behavioral tracking and an Attendance Management module equipped with "Quick Action" features and exportable Excel reports for administrative documentation.

However, as a capstone prototype, the system operates within certain defined boundaries. Its capabilities are currently dependent on a stable internet or local network connection, meaning real-time features such as quiz submissions and dashboard updates require active connectivity. Additionally, while the system is fully responsive across standard web browsers, it does not include a dedicated standalone mobile application (APK/iOS). The current scope also excludes advanced data mining or AI-driven predictive analytics for student performance and does not support integrated live video conferencing or real-time instant messaging. These limitations define the current development scope of the MNHS LearnHub as a specialized institutional platform for curriculum management and academic reporting.

Project Capabilities

The MNHS LearnHub system has the following capabilities:

1. The system enables teachers to upload, organize, and categorize learning modules by subject and grade level, ensuring that students have a centralized digital repository for all their academic resources.

2. The system provides a secure hub for administrators to oversee all accounts, allowing them to add, edit, or delete users (Administrators, Principals, Teachers, and Students) to maintain an organized school database.

3. The platform supports the creation of online quizzes and summative examinations with automatic checking features, providing students with instant results and reducing the manual grading workload for faculty.

4. The system includes a timer functionality for assessments, ensuring that examinations are conducted within a set duration to maintain academic integrity and simulate a real classroom environment.

5. The system features a real-time dashboard that visualizes institutional data, such as the total number of registered users, active participants, and the distribution of students across different subjects.

6. The system utilizes a specialized interface with "Quick Actions" (Mark All Present/Absent/Late), allowing teachers to monitor classroom engagement efficiently without manual paper-based logs.

7. The platform enables educators to filter academic and attendance data by date or subject to generate comprehensive reports, which can be exported to Excel for official administrative documentation.

8. The system provides tools for both teachers and students to track academic progress and attendance percentages, allowing for early intervention if a student is falling behind.

9. The system includes a unique module for filing and tracking student incidents (behavioral or academic), helping the Principal and Teachers identify patterns and maintain a safe learning environment.

10. The system allows for a clear hierarchy where the Administrator finalizes subjects, and Teachers manage specific lessons, ensuring the curriculum is updated and visible to the correct student sections.

11. The system integrates advanced search bars and category filters across all modules, making it easy for users to find specific students, subjects, or reports within seconds.

12. The platform is built to be accessible through standard web browsers, ensuring that students and staff can access their lessons and school data using desktops, laptops, or tablets.

Project Limitations

1. The system requires a constant internet or local network connection to access files, take quizzes, and update the dashboard in real-time.

2. While the system works on mobile browsers, the layout is designed for desktops and tablets, which may cause some buttons or tables to look unaligned on smaller phone screens.

3. The platform does not have built-in live chat, messaging, or video calling features, meaning users must use external apps to talk to one another.

4. The system provides basic data summaries like totals and percentages but cannot perform complex AI predictions or deep data mining of student behavior.

5. The MNHS LearnHub is an independent platform that cannot automatically sync or share data with other outside school apps or databases.

6. The system can automatically grade multiple-choice or objective quizzes, but teachers must still manually grade essays and performance tasks.

7. There is no "self-register" button for students, so administrators must manually create and input every user account to keep the data secure.

8. Users can upload and download files, but they cannot edit documents together at the same time inside the system like they do in Google Docs.

CHAPTER 5

CONCLUSIONS AND RECOMMENDATIONS

A. Summary of Findings

Based on the results of system testing and evaluation, the following findings were identified:

1. **Functional Suitability:** The system does exactly what it was built to do, like managing lessons and checking quizzes without errors.

2. **Performance Efficiency:** The website loads quickly and handles data like student lists and reports without lagging.

3. **Compatibility:** The system can be opened and used on any modern web browser without breaking the layout.

4. **Usability:** The design is simple enough that even new users can figure out how to use the buttons and menus easily.

5. **Security:** Only people with a registered username and password can see private info, protecting the school's records.

6. **Portability:** Since it is a website, it is easy to move to different servers or access from different devices anywhere.

B. Conclusions

Based on the findings of the study, the following conclusions were drawn:

1. That the "MNHS LearnHub: An E-Learning System for Muntinlupa National High School" is a centralized and unified digital platform specifically designed for the students and faculty of Muntinlupa National High School.

2. That the system effectively manages and displays the personal information, roles, and academic profiles of students, teachers, and administrators through a secure User Management Module.

3. That the system successfully computerized the organization and distribution of learning materials through a Module Management System, allowing for categorized access by subject and grade level.

4. That the system is capable of conducting Online Assessments and Quizzes with automatic checking features, providing immediate results and generating student performance summaries.

5. That the system has the ability to Generate Attendance Reports and academic summaries either individually or in bulk, which can be exported for official documentation.

6. That the system provides an Interactive Dashboard capable of monitoring the real-time status and distribution of users and academic activities across the institution.

7. That the system includes specialized documentation features, such as the Incident Reporting Module, to track and manage student behavioral and academic concerns efficiently.

8. That the system is a secured web-based system utilizing role-based access control to protect sensitive school data from unauthorized access.

C. Recommendations

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