



# Proceedings of the Fifth Annual Scientific Research Conference

**Baghdad College High School/Adhamiya**

Corresponding Author:  
Dr. Ammar Adel Hussein  
Head of the Research and Innovations Center Unit  
[amaradel61@gmail.com](mailto:amaradel61@gmail.com)  
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**Dr. Riyadh Atta Al-Obaidi**  
**Dean of Baghdad College High School**

**Members of the Research, Innovation and Student  
Talent Center Unit**

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Head of the Research and Innovations Center Unit

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# **Designing an Interactive Periodic Table to Facilitate the Study and Understanding of Chemical Elements and Their Interactions for Middle and Intermediate Stages**

**Researcher's Name: Saif Muhannad Mawlood**

**Supervisor: Dr. Ammar Adel Hussein**

## **Introduction**

The periodic table, also known as the periodic table of elements, is a system for organizing chemical elements into rows (periods) and columns (groups). This organization is used widely in chemistry, physics, and other sciences. The credit for this system goes to the Russian scientist Dmitri Mendeleev, who proposed that arranging the elements by their atomic number reveals recurring properties (periodicity), which helps to demonstrate the shared characteristics of chemical elements and classify them accordingly.

Chemistry is one of the scientific subjects that students often find difficult, especially when it comes to understanding the periodic table and the chemical interactions between elements. According to educational studies, many students struggle with linking chemical symbols to effective reactions, which impacts their deep understanding of the subject.

## **Research Idea**

This research focuses on creating and developing an interactive electronic program that presents the chemical elements in a periodic table with advanced features. It allows students to experience chemical reactions virtually by clicking on any element to display its properties and possible chemical interactions, in a fun and safe way. The program provides a database of chemical interaction data, allowing students to choose a specific element and observe its reaction when clicked, along with a detailed explanation of its chemical properties and possible interactions. It's worth mentioning that the table was designed and programmed using the JavaScript language.



## Research Summary

This project allows students to explore chemical elements and their interactions within a digital environment that simulates a virtual lab. This contributes to simplifying chemistry studies and increasing student interaction with the subject. Students can select different elements and combine them to observe the reaction results, where the interface displays the reaction's color, the resulting chemical compounds, and their properties in an interactive and educational way.

The project also provides a digital library of chemical interactions that enables students to review potential reactions. When a student clicks on any element, a detailed explanation of its chemical properties and potential reactions is displayed in a separate window. This provides an educational tool accessible to all students, eliminating the need for a physical lab. This makes displaying chemical reactions easier, safer, and more engaging, while also opening the door for future development such as adding more complex reactions.

## Research Importance

The importance of the research lies in presenting a modern and innovative method for teaching chemistry by reducing reliance on rote memorization and enhancing interactive learning. It improves student engagement with chemistry through the periodic table and the possibility of simulating chemical experiments virtually, without the risks associated with real experiments. It provides a valuable tool for studying chemical interactions without the need for physical labs.

It also offers teachers an effective educational tool to explain chemical interactions in a flexible and clear way, allowing students to learn anytime and anywhere. This strengthens comprehension and motivates learning via an interactive electronic platform. Through this platform, students can explore elements and reactions in an engaging experimental way that helps solidify chemical concepts in their minds.

**Fe Iron**

Atomic Number 26

Category Transition Metal

Period 2

Alternative Names Ferrum

**Common Reactions**

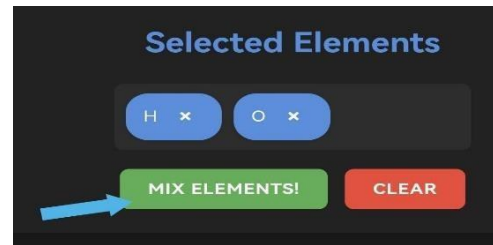
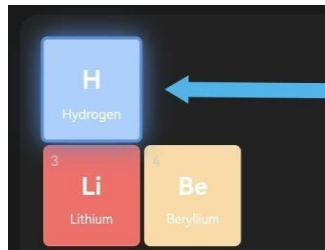
- Nd<sub>2</sub>Fe<sub>14</sub>B - Neodymium Magnet Compound
- Fe<sub>2</sub>O<sub>3</sub> - Iron(III) Oxide
- FeS - Iron Sulfide

Related Elements



### Mixing Recipes

<b>AgOH</b> Silver Hydroxide An unstable compound that decomposes to silver oxide <chem>AgOH</chem>	<b>H2O</b> Water A clear, colorless liquid essential for life <chem>H O</chem>	<b>NaCl</b> Table Salt Common table salt, essential for life and food seasoning <chem>Na Cl</chem>
<b>HCl</b> Hydrochloric Acid A strong acid found in stomach acid and used in industrial processes <chem>H Cl</chem>	<b>HF</b> Hydrofluoric Acid A highly corrosive acid <chem>H F</chem>	<b>CO2</b> Carbon Dioxide A greenhouse gas produced by respiration <chem>C O O</chem>
<b>NH3</b> Ammonia A pungent gas used in cleaning products <chem>N H H</chem>	<b>CH4</b> Methane The simplest hydrocarbon <chem>C H H H</chem>	<b>NaF</b> Sodium Fluoride Used in toothpaste to prevent cavities <chem>Na F</chem>



**H2O**  
Water

### Result

**H2O - Water**  
A clear, colorless liquid essential for life  
*This compound has been added to your available compounds below!*



# **Creating and Designing an Application that helps Determine the Health Status of the user and by Sending them Data and Advise using Artificial Intelligence**

**Researchers' Names: Ahmed Ibrahim Zamil & Abdullah Khaled Jamal**  
**Supervisor: Nihaya Abdul Satter M.**

## **Introduction**

Artificial intelligence has become one of the most important modern technologies, playing a major role in improving the quality of daily life. It is used in many fields such as healthcare, education, industry, and entertainment. It has moved beyond being just an advanced technology confined to research and laboratories to become a vital tool that facilitates tasks and improves human performance accuracy. Among the most prominent sectors that have benefited from AI is the medical sector, where it is used to analyze medical data and diagnose diseases, helping doctors make accurate and timely clinical decisions. With the increasing complexity of medical data, it has become necessary to find advanced technical solutions that contribute to better healthcare goals this research aims to achieve.

## **Research Idea**

The application relies on collecting vital data from smart devices, such as smartwatches, which measure heart rate, blood oxygen level, and blood pressure. This data is sent to an AI system for accurate analysis and health recommendations based on the user's condition. The app aims to simplify the diagnostic process for doctors by providing reports, and ordinary users, especially the elderly, can benefit from it to better understand medical test results. In addition, the app enables storing health data in digital personal profiles, allowing for long-term health monitoring and improving the accuracy of future diagnoses.

## **Research Summary**

The research highlights the effective role of AI in improving the quality of healthcare by analyzing medical data accurately and quickly. The application aims to support doctors by providing analytical data that aids in making informed treatment decisions. Moreover, the app features a user-friendly interface, making it accessible to all age groups without requiring advanced technical knowledge. The research also ensures users' privacy by giving them control over their health data, thus enhancing trust in the use of technology in the medical field.



## Research Importance

The importance of the research lies in utilizing AI capabilities to serve the medical field and achieve a qualitative leap in the level of healthcare. Through this application, the rate of chronic and sudden diseases can be reduced through continuous monitoring and early diagnosis, which improves treatment opportunities and reduces complications. It also helps doctors improve diagnostic accuracy by benefiting from the intelligent analyses provided by the system, enabling them to make faster and more precise medical decisions. Furthermore, the research promotes integration between technology and medical expertise, as AI works hand in hand with doctors. This reflects an advanced vision of the future of healthcare, where technology becomes a means to support humans and enhance their ability to provide better care, thereby improving the lives of individuals and society as a whole.

Enter Your Blood Pressure (mmHg)

SYS/DIA

Enter Your Height (CM)

Enter Your Weight (KG)

Enter details and click Predict

Enter Your Blood Glucose Level (mg/dL)

When Was Your Last Meal? (Time)

Enter Your Heart Rate (BPM)

Import

Tell us about yourself

Result



# Creating an Electronic Sensor to Assist the Visually Impaired Using Arduino

**Researcher Name: Hamza Marwan Fadhel Al-Sewaidi**

**Supervisor: Dr. Ammar Adil Hussein**

## Introduction

Assisting the visually impaired in moving safely and independently is one of the major challenges that modern technology can significantly contribute to solving. Technology plays a vital role in improving the quality of life for the visually impaired, as there are innovative means available to help them overcome obstacles and navigate safely. Through modern developments in artificial intelligence and smart devices applications, assistive tools have become available to the visually impaired, enabling them to communicate quickly and access information more effectively. For instance, providing smart tools that transform written texts into audible speech, or detecting obstacles and alerting the user with audio or vibration signals. Blindness is no longer considered a hindrance to education, employment, and active participation — they form a very important segment of society

## Research Idea

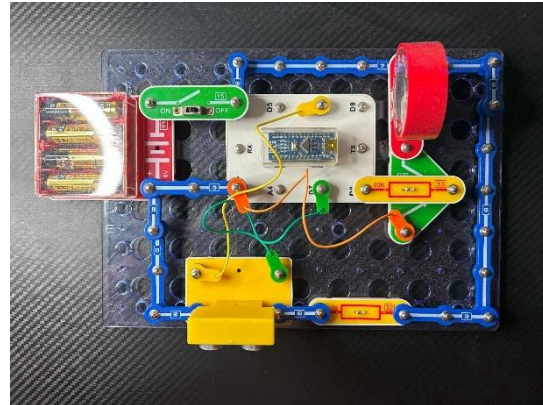
The development of an electronic sensor based on Arduino to assist the visually impaired in navigating safely by detecting obstacles and alerting the user using audible or vibrational signals

## Research Summary

This research presents the design and development of an electronic sensor based on Arduino to help the visually impaired navigate safely. The system relies on ultrasonic sensors to detect obstacles and send audible or vibrational alerts to the user. In testing the device under different conditions to ensure its accuracy and efficiency in improving the movement of the visually impaired, the results showed that the sensor is capable of providing effective real-time alerts, which enhances the user's independence. Additionally, the device is characterized by low cost and ease of manufacturing, making it a practical solution. The research recommends further development of the device in the future by integrating artificial intelligence technologies to improve its performance

## Research Importance

The importance of this research lies in developing a means to assist the visually impaired in moving safely and independently by detecting obstacles and providing real-time alerts. The device stands out due to its low cost and ease of use compared to other methods, making it practically applicable. The research also opens the door to further development to provide more intelligent assistance using modern technologies such as artificial intelligence





# Removal of Pharmaceutical Substances from Water Using the Adsorption Process

**Researcher's Name: Hussein Alaa Jumaa**

**Supervisor: Dr.Fatma Dheif Ali**

## Introduction:

Water pollution is one of the emerging types of pollution resulting from the entry of pollutants into the natural environment, often caused by the discharge of untreated industrial waste and sewage into natural water bodies. This leads to environmental problems, and consequently to health problems due to the pollution of water in aquatic environments, affecting the living organisms and the ecosystems that inhabit these water surfaces. In addition to the pollution of living organisms and plants that are exposed to such conditions, the impact is not limited to individual species but also extends to entire natural biological communities.

## Research Idea

1. Purifying and treating water using natural materials (eggshells).
2. Studying the effect of pH and concentration of the contaminant on the removal efficiency.

## Research Summary

The adsorption process has proven to be one of the best scientifically recognized water treatment techniques, as it depends on the ability of an adsorbent to remove pollutants from water. Activated carbon is widely used due to its high effectiveness. However, due to its high cost, researchers have begun seeking alternative, low-cost natural materials. This study attempts to use eggshells as a natural material to remove pharmaceutical substances, specifically salicylic acid.

A series of experiments were conducted to test the efficiency of removal using eggshells under various conditions (pH levels 1–10 and pollutant concentrations of 1–2.5 ppm). The study showed that the optimal removal efficiency was obtained under acidic conditions, particularly when using salicylic acid at a concentration of 2.5 ppm. The results indicated a high removal efficiency of **73.3%** when the pH was 2 and the eggshell concentration was 2.5 g.

## Importance of the Research

Removing pollutants from water is essential to protect human health from diseases caused by contaminants. It also preserves biodiversity and prevents the deterioration of aquatic ecosystems. Providing clean water for domestic, agricultural, and industrial use promotes sustainability. Furthermore, it helps reduce negative environmental changes and improves the quality of life.



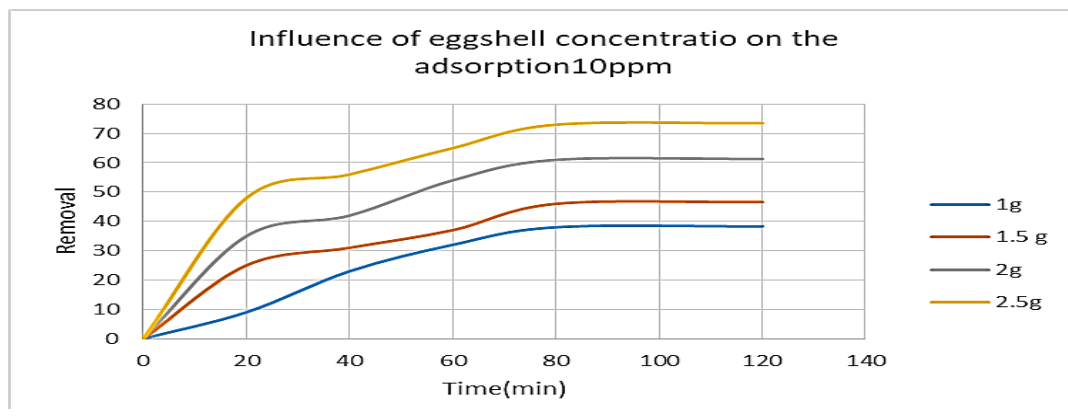
*Examination of the solution using an ultraviolet spectrometer*



*Add eggshells to the solution*



*an aqueous solution contaminated with pharmaceuticals*



*A diagram illustrating the relationship between the removal rate and the amount of adsorbent over time.*



# **Design and Development of an Electronic Application to Teach English Letter Sounds Under the Name “Mr. Cloud” for Children in Early Educational Stages**

**Researcher Name: Al-Hassan Bilal Safaa**

**Supervisor: Maryam Abbas Kashkoul**

## **Introduction**

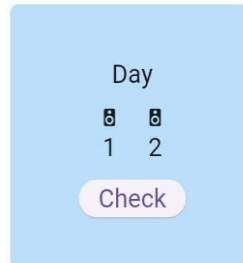
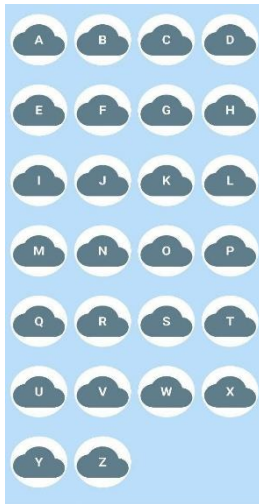
Teaching English letter sounds to children is one of the essential foundations for building reading and correct pronunciation skills. Due to the great development in educational methods, traditional techniques that rely on memorizing letter names without mastering their pronunciation are no longer effective. From here, the idea of designing a smart and interactive educational tool called “Mr. Cloud” emerged to offer children an enjoyable and innovative learning experience. It combines fun and benefit through audio pronunciation blending, explanatory videos, and interactive practice exercises.

## **Research Idea**

This research aims to develop an educational electronic application targeting children and adults to teach English letter sounds in an effective and interactive manner. To achieve this, the application “Mr. Cloud” relies on a set of interactive elements that help students pronounce letters correctly and enjoyably. Its user-friendly interface is suitable for children at an early age. During this stage, the brain can absorb and store knowledge easily. Additionally, the application is made freely available without fees, which contributes to spreading knowledge and helps expand the user base.

## **Research Summary**

This research highlights the importance of correct phonetic sounds in developing reading and pronunciation skills in children. It also clarifies how modern technology can play a significant role in this field. The “Mr. Cloud” application represents an effective model for teaching English letter sounds, relying on modern methods of interactive learning



The application provides integrated content that includes a (QUIZ) feature to ensure understanding by offering practical knowledge tests. It guarantees verifying the extent of concept comprehension. This application, through its educational approach that combines learning with entertainment, can be used for different age groups, especially in the preparatory stages, to achieve noticeable progress in pronunciation and reading skills

### Research Importance

This research gains importance from its focus on correct pronunciation for children in the kindergarten stages (KG1, KG2, KG3). The program presents a new and innovative way to help them learn to read fluently. It also provides opportunities for children and others with speech difficulties to correct their pronunciation and develop their language skills.

Mr. Cloud is considered a supportive tool for previous educational efforts. It can be adopted in nurseries and kindergartens as an advanced and effective educational method. This contributes to enhancing the principle of equal educational opportunities by providing it free of charge to everyone, opening the door to a broader range of learners to benefit from it and assisting in updating traditional educational strategies through the use of modern technology

# Creating an Electronic Lifebuoy for Rapid Rescue from Drowning

**Researcher's Name: Ghaith Omar Farooq**

**Supervisor: Ali Abdul Jabbar Darwish**

## Introduction

Drowning is a leading cause of unintentional death globally. According to the World Health Organization (WHO), around 236,000 people die annually due to drowning, making it the third leading cause of unintentional injury death worldwide. This alarming statistic highlights the urgent need for an innovative and rapid rescue method to reach emergency situations effectively.

## Research Idea

The idea involves designing and manufacturing an electronic lifebuoy that can be controlled remotely to reduce error rates in throwing it and ensure that the rescue team can reach the drowning person more accurately and quickly compared to traditional lifebuoys.

## Research Summary

This research proposes linking the lifebuoy to a small drone controlled electronically. The drone is equipped with a propeller and a camera to facilitate vision, especially at night, with the addition of lighting. By using a remote-control unit, the drone can guide the lifebuoy to the drowning person at the correct time and location, ensuring timely and effective intervention.

## Research Importance

Reducing the number of drowning victims in water by quickly sending the lifebuoy to the drowning person in a short time. The cost of manufacturing the lifebuoy is reasonable, and the success rate of rescue using it is high.





# Developing AI-Integrated Tools to Improve Student Academic Performance and User Capabilities

[ MIRAFIELD-AI ]

Researcher's name: mustafa waleed hameed

Supervisor: Youssef Akram Jawad

## Introduction

In the age of modern development, Artificial Intelligence (AI) has recently emerged as a fundamental component across various fields of life, becoming an indispensable tool for many people, and is constantly being developed on a daily basis.

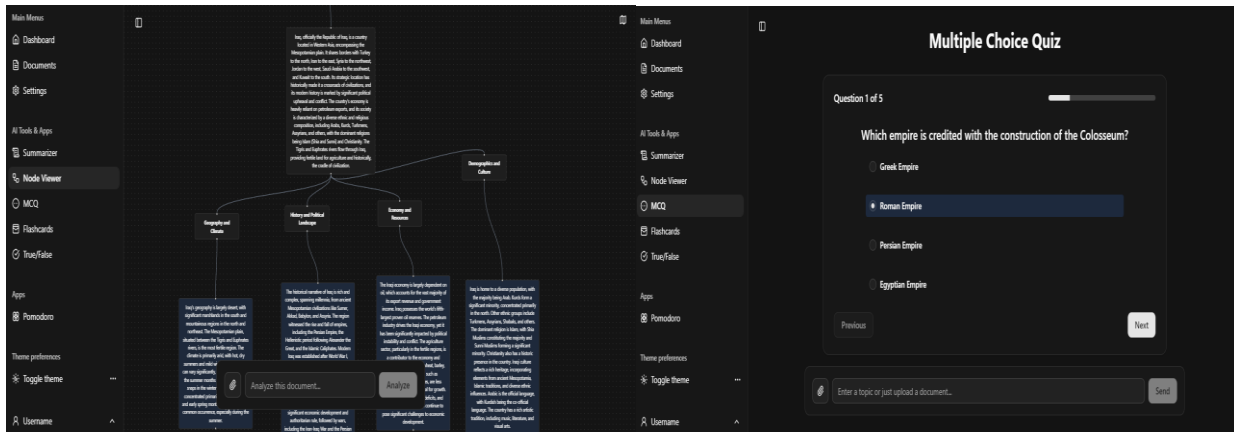
Connecting education with AI is a pivotal step towards developing the educational process, making it more effective and adaptable to the needs of learners. AI allows for the provision of educational content customized for each student based on their level and abilities. It also contributes to improving performance evaluation and providing immediate feedback that enhances understanding. Through data analysis, educators can make more accurate decisions that support the overall improvement of educational outcomes.

## Research Idea

The "Mirafield" project is a web application that offers smart solutions and tools for students and all users. The website provides a set of AI-powered tools that enable users to analyze files and topics, enhance the process of memorization and comprehension, in addition to offering tools for tests, simplifying complex operations, and improving productivity through the integration of various smart tools that receive user input from topics or documents.

The most prominent tools in Mirafield include:

- **Content Analysis and Summarization Tool:** Helps users extract core ideas from long texts.
- **Information Organization Tool:** Facilitates the organization and understanding of information through visual representation that aids in visualizing the relationships between concepts.
- **Questions and Tests Tool:** Allows for the preparation of multiple-choice questions and tests.
- **Flashcards Creation Tool:** To enhance the memorization process and focus on important information.



## Research Summary

Research has shown that integrating AI into user-friendly tools increases individual learning, facilitates task completion, and helps in efficiently inferring broad topics. It was also found that these tools promote deep understanding and contribute to the quick organization and analysis of information, making the learning and comprehension process more accurate and effective. Furthermore, studies have demonstrated that using AI in educational and professional fields reduces the time and effort expended, allowing individuals to focus on creative and developmental aspects instead of routine tasks.

## Research Importance

The significance of this research lies in its representation of the first integrated Iraqi platform that relies on AI to provide innovative educational solutions.

The key points of importance include:

- **Promoting the use of AI:** The project helps expand the scope of using AI technologies in Iraq, opening new horizons for development and innovation.
- **Increasing Productivity:** By providing interactive tools that reduce the time spent on repetitive and complex tasks.
- **Developing Education and Work:** The project contributes to improving the learning and working environment by equipping users with effective tools that help in better understanding and organizing information.

The success of "Mirafield" also reflects Iraq's capability for innovation in the field of digital technology, which encourages more research and technical projects within the country.



# Designing an Electronic Website for Baghdad College High School to Facilitate Administrative Procedures for Visitors

**Researcher: Hasan Diao Aziz**

**Supervisor: Dr. Nihaya Abdul Sttar**

## Introduction

With the rapid advancement of technology and the shift toward digital transformation, educational institutions are increasingly required to adopt electronic systems that enhance administrative efficiency and simplify routine procedures. Creating an online platform for booking appointments with the school principal or assistants represents an important step toward improving the administrative environment within schools. Such a system helps organize communication between students and parents on one side, and school administration on the other. This research aims to highlight the advantages of adopting this digital solution and the problems it helps resolve.

## Research Concept

This study focuses on developing an electronic system that enables students and parents to officially book appointments online with the school principal or administrative assistants. These appointments may include requests for official documents such as graduation verification, enrollment verification, or administrative and academic inquiries.

The system provides predefined available time slots, which helps reduce overcrowding in administrative offices and allows the school administration to manage tasks more efficiently. It also offers an electronic mechanism for tracking requests, thereby reducing administrative errors and speeding up task completion.

## Research Summary

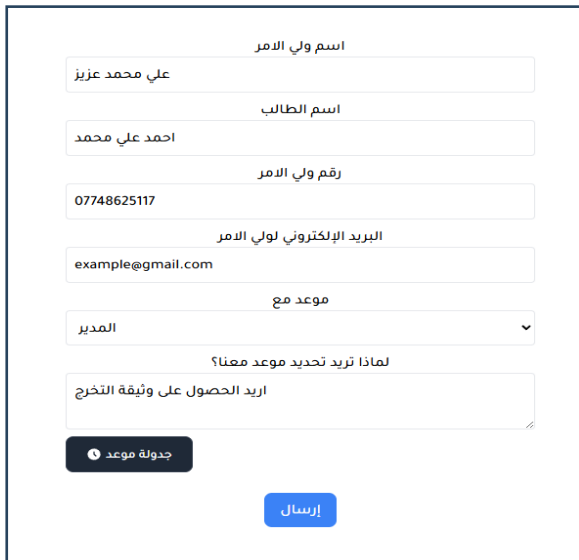
Developing an online appointment-booking platform for handling administrative tasks and school visits aims to improve the quality of administrative services, reduce the workload on staff, and save time for students and parents by organizing the review process smoothly and efficiently. This system minimizes administrative chaos, records requests electronically, and facilitates tracking of procedures, creating a seamless experience for all parties.

Additionally, digitizing these services increases responsiveness and supports creating a modern educational environment that aligns with contemporary trends in school management. This website was built using:

## Node.js – React.js – MongoDB – Tailwind CSS

### Research Importance

The significance of this research lies in presenting an innovative technological solution that enhances the administrative work environment within schools, making it more efficient and organized. The online platform helps reduce waiting time, improve the quality of administrative services, and enhance transparency between the administration and students. Moreover, this digital solution supports the broader movement toward digital transformation in educational institutions, thereby improving overall school performance and increasing student and parent satisfaction with the services provided.



اسم ولي الامر  
علي محمد عزيز

اسم الطالب  
احمد علي محمد

رقم ولي الامر  
07748625117

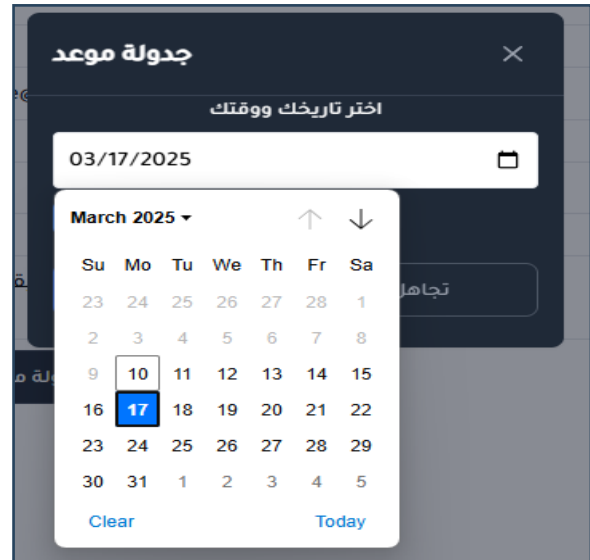
البريد الإلكتروني لولي الامر  
example@gmail.com

موعد مع  
المدير

لماذا تريد تحديد موعد معنا؟  
اريد الحصول على وثيقة التخرج

جدولة موعد

إرسال



جدولة موعد

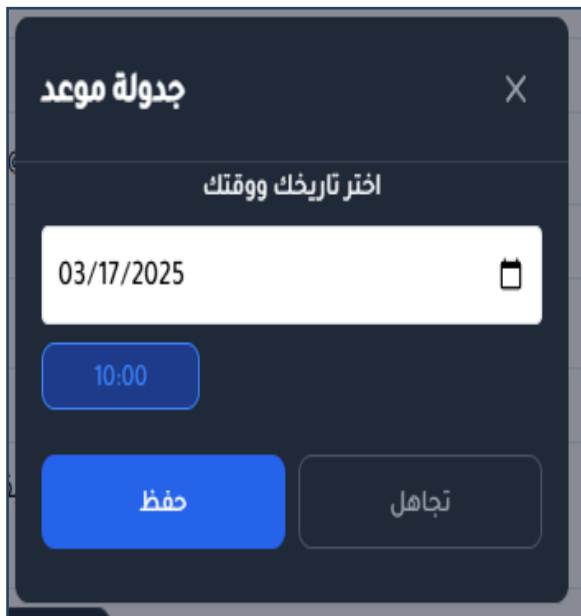
اختر تاريخك ووقتك

03/17/2025

March 2025

Su	Mo	Tu	We	Th	Fr	Sa
23	24	25	26	27	28	1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31	1	2	3	4	5

Clear Today



جدولة موعد

اختر تاريخك ووقتك

03/17/2025

10:00

حفظ تجاهل



لوحة المدير

تحديد الأوقات المتاحة

المواعيد المقبولة

المواعيد المرفوضة

المواعيد السابقة

المواعيد

اسم ولي الامر: علي محمد عزيز  
اسم الطالب: احمد علي محمد  
رقم ولي الامر: 07748625117  
البريد الإلكتروني لولي الامر: example@gmail.com

موعد مع: Principal  
Date: 2025-03-17  
Time: 10:00  
Status: Pending

قبول رفض

عرض المعلومات الإضافية