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Development of an E-learn site DZ-Teacher

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GENERAL INTRODUCTION

In a constantly evolving world, education remains a fundamental pillar for personal and societal development. The rise of digital technologies has transformed not only the way knowledge is disseminated but also how learners and teachers interact. This dynamic context presents unprecedented opportunities to address modern educational challenges, particularly in terms of personalized learning and accessibility to educational resources.

With this vision in mind, **DZ-Teacher**, a platform designed to connect private tutors with students and parents seeking academic support, aims to bridge the gap between quality education and those who need it. By leveraging technology, the platform facilitates the search for qualified teachers based on subjects, educational levels, and geographic location, while also offering tools to manage lessons, payments, and access to pedagogical resources.

This report explores the conception, development, and implementation of DZ-Teacher, highlighting its role in transforming the traditional tutoring experience into a modern, flexible, and accessible educational solution.

CHAPTER I

PROJECT PRESENTATION

I.1 INTRODUCTION

This chapter explores the selection of the theme for the **DZ-Teacher** platform and outlines the objectives of this report. We will examine the motivations behind this thematic choice, its significance in the field of education, and the specific expectations set for this document. The chapter begins with an analysis of the reasons for developing a platform connecting private tutors with students and parents, emphasizing its strategic importance in the context of modern educational challenges. In parallel, we will clearly define the specific objectives of this report, aimed at providing a comprehensive understanding of the creation process for a platform designed to enhance access to personalized learning and support.

I.2 THE CHOSEN SCENARIO AND ITS SIGNIFICANCE

The emergence and rapid advancement of technology have revolutionized the education sector, providing new opportunities for collaboration, accessibility, and tailored learning experiences. In this context, the decision to develop **DZ-Teacher**, a platform connecting private tutors with students, is driven by several key factors:

◊ **Enhanced Access to Quality Education**

The platform leverages digital connectivity to bridge the gap between students, parents, and highly qualified tutors, ensuring access to quality education regardless of geographical constraints. This approach addresses disparities in educational opportunities and promotes inclusivity.

◊ **Flexibility in Learning**

Through the platform, students and parents can find tutors based on their specific needs, including subject matter, educational level, and availability for in-person or online sessions. This flexibility ensures a customized learning experience tailored to individual goals.

◊ **Simplified Resource Management**

DZ-Teacher provides tools for scheduling sessions, tracking payments, and accessing a library of educational resources. These features simplify the management of tutoring sessions and enhance both tutor and student experiences.

◊ **Cost-Effective Solution**

By creating a centralized platform, operational costs associated with traditional in-person tutoring arrangements are reduced. This efficiency benefits both tutors and students by streamlining administrative processes.

◊ **Encouraging Lifelong Learning**

The platform fosters a culture of continuous education by making it easy for learners to find and engage with tutors who match their specific learning objectives, encouraging skill development at all levels.

- ◊ **Promoting Collaboration and Feedback**

Through integrated communication and feedback features, the platform encourages productive interactions between students, parents, and tutors, ensuring that the learning experience is continuously improved.This thematic choice reflects the growing demand for innovative educational solutions, addressing key challenges while promoting accessibility, flexibility, and collaboration.

I.3 OBJECTIVE OF THE REPORT

The primary objective of this report is to provide a detailed examination of the process involved in designing and implementing the **DZ-Teacher** platform. This document will offer an in-depth analysis of the platform’s functional and non-functional requirements, covering key aspects such as user profiling, personalized search capabilities, course management, and the integration of educational resources.

The report will explore the conceptualization of the platform, including the use of system diagrams and models to design its structure, the implementation of search and filtering functionalities, and the development of tools to manage schedules, payments, and resources.

By outlining the specific requirements, constraints, and technologies employed, this report serves as a comprehensive guide for anyone undertaking a similar project in the field of educational technology. Through this detailed analysis, the report aims to demonstrate how a well-designed platform can effectively support tutoring services, ensuring accessibility, reliability, and a user-friendly experience for all stakeholders. In summary, the document provides a clear and practical understanding of the processes and considerations involved in creating **DZ-Teacher**, a platform dedicated to enhancing personalized learning and educational support.

CHAPTER 2

REQUIREMENTS ANALYSIS

II.1 INTRODUCTION

This chapter focuses on a detailed analysis of the functional and non-functional requirements for the **DZ-Teacher** platform. We will thoroughly examine the expected functionalities, specific features, and constraints necessary to ensure the platform's smooth operation and optimal performance.

II.2 ANALYSIS OF FUNCTIONAL REQUIREMENTS

The **DZ-Teacher** platform is designed to address the functional needs of its users, providing essential features to deliver an optimal user experience. The primary functional requirements include:

Features for Teachers:

1. **Profile Management:**
    - Teachers can create and manage their profiles by uploading CVs, diplomas, and other credentials.
    - They can specify the subjects and levels they teach, set their rates, and indicate their availability.
2. **Resource Sharing:**
    - Teachers have access to a dedicated space for uploading and sharing pedagogical resources with their students.
3. **Course Scheduling:**
    - Teachers can plan and organize sessions with students, ensuring a clear and structured timetable.

Features for Students/Parents:

1. **Personalized Search:**
    - Users can search for teachers based on subject, level, geographic location, and availability for in-person or online sessions.
    - Advanced filtering options allow users to refine results by price and other criteria.
2. **Teacher Profiles:**
    - Students and parents can view detailed teacher profiles, including qualifications, subjects taught, rates, and reviews from other users.
3. **Session Booking:**
    - Students can book tutoring sessions directly through the platform, selecting available time slots as per the teacher's schedule.

Shared Functionalities:

1. **Payment Management:**

    - The platform supports secure online payment for sessions, with tracking for completed transactions and outstanding payments.
2. **Feedback and Reviews:**
    - Students and parents can leave feedback on their tutoring experience, which teachers can use to enhance their services.
3. **Notifications:**
    - The system sends reminders and updates regarding upcoming sessions, payment deadlines, and new resources added by teachers.

By addressing these functional requirements, the **DZ-Teacher** platform ensures a seamless, efficient, and user-friendly experience for both tutors and students.

II.3 ANALYSIS OF NON-FUNCTIONAL REQUIREMENTS

The non-functional requirements ensure the platform's quality and enhance the overall user experience. Key aspects include:

- **Performance:**
  The platform must deliver a fast, responsive experience with minimal delays, even during peak usage periods.
- **Security:**
  Protect user data and ensure privacy through robust measures to prevent unauthorized access and data breaches.
- **Reliability:**
  Ensure consistent availability and stability to minimize service interruptions.
- **Usability:**
  The interface should be user-friendly, intuitive, and accessible to all user types, providing a seamless experience.
- **Scalability:**
  The system must accommodate a growing number of users and data without compromising performance.
- **Maintenance:**
  Simplify platform maintenance and updates to ensure ongoing stability and user satisfaction.
- **Compatibility:**
  The platform must integrate smoothly with various devices, operating systems, and technologies used by its users.

II.4 REQUIREMENT COLLECTION

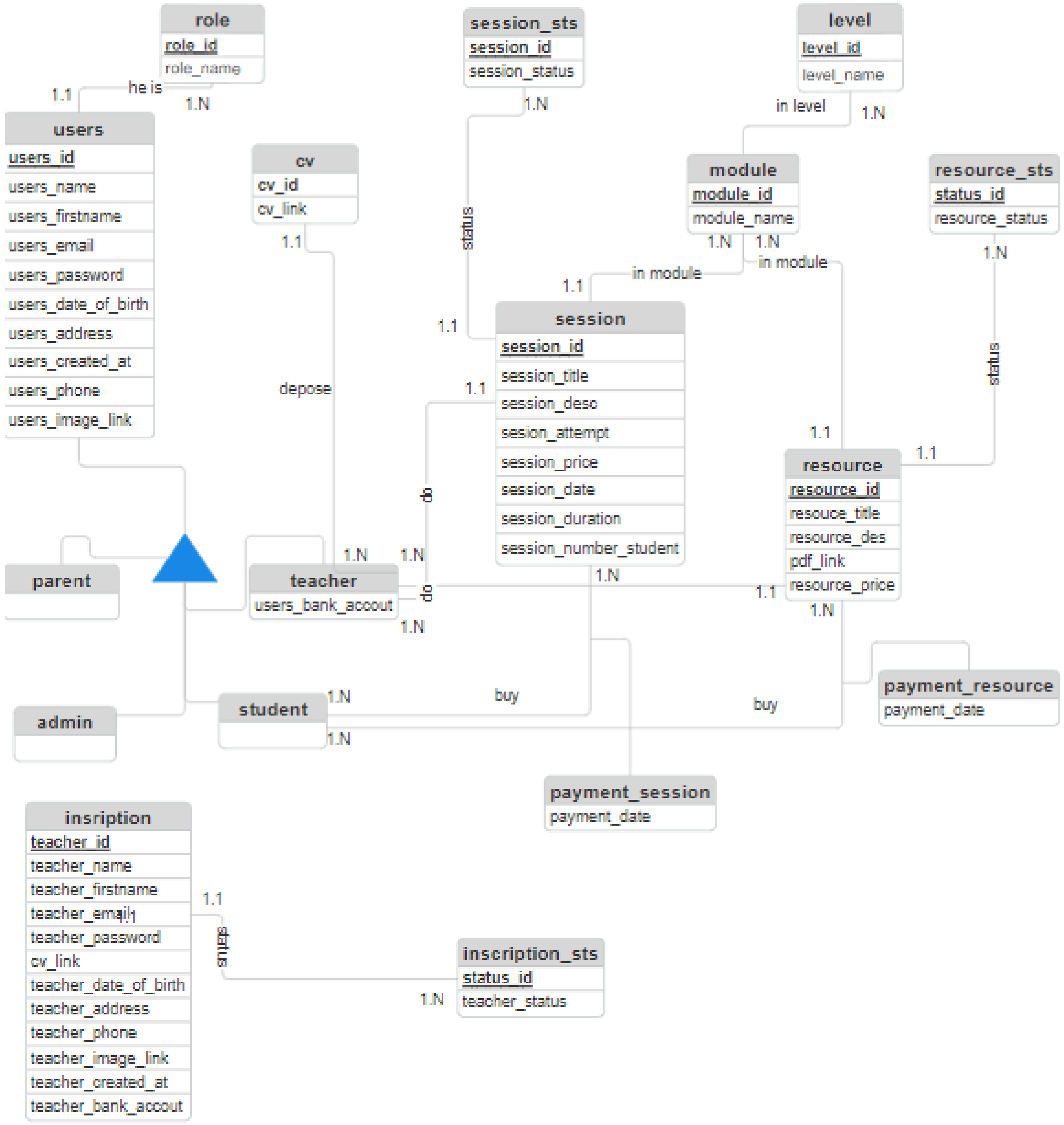
The requirements for the **DZ-Teacher** platform were gathered through a collaborative approach. The team conducted:

1. **Internal Discussions:**
    - Sessions with all team members to align on visions, share ideas, and consolidate perspectives.
2. **Research and Analysis:**

- ○ Exploring best practices and current trends in the educational platform industry to identify user expectations, competitive features, and security standards.

This collaborative approach and comprehensive research helped define functional and non-functional requirements tailored to the platform's objectives. These requirements form the foundation for a robust, user-friendly, and secure platform, ensuring a seamless experience for all users.

II.5 ER Model



Constraints:

-the teacher post request first to get accepted as a teacher, the request will be into inscription table,
-the admin choose to accept the teacher or not.
-the request in inscription can have one of three inscription status : waiting, hired, rejected
-the resource pdf can have one of status: published, deleted
-the session can have one of status: published, finished, canceled

II.6 Relational Model

The term relational data model refers to a way of structuring information in the form of matrices called tables or relations. This model, very simple, is by far the most widespread in Database Management Systems (DBMS), which are thus called relational DBMS.[4] The Rules for transforming the entity-relationship model into the relational model are as follows:

→ an entity becomes a relationship.

→ a property becomes an attribute.

→ an identifier becomes a primary key (underlined).

→ an association becomes a relation, if the maximum cardinalities are n.n

→ an association transmits the identifier of the entity with maximum cardinality n to the entity with maximum cardinality 1 (the identifier is thus preceded by a #). For our model, we will have:

1- Users (user_id , users_name , users_firstname , users_email , users_password , users_date_of_birth , users_address , users_phone , users_image_link ,users_created_at , users_bank_account, #role_id ,#users_parent)

2- Role (role_id , role_name)

3- Level (level_id , level_name)

4- Inscription (teacher_id , teacher_name , teacher_firstname , teacher_email , teacher_password , cv_link , teacher_date_of_birth , teacher_phone , teacher_address , teacher_image_link , teacher_created_at ,teacher_bank_account ,#teacher_status)

5- Module (module_id , module_name ,#module_level)

6- Resource (resource_id , resource_title , resource_description , pdf_link , resource_price , #resource_module , #uploaded_by , #resource_status)

7- Resource_sts (status_id , resource_status)

8- Payment_resource (payment_date , #resource_key , #download_by)

9- Inscription_sts (status_id , teacher_status)

10- Session (session_id , session_title , session_description , session_attempt , session_price , session_date , session_duration , session_number_student #session_status , #session_teacher , #session_module)

11- Session_sts (status_id , session_status)

12- Payment_session (payment_date , #session_key , #attempted_by)

13- Cv (cv_id , cv_link , #teacher_cv)

CHAPTER 3

DATA DICTIONARY

III.1 INTRODUCTION :

-This chapter provides a detailed overview of the essential structure of our Dz-teacher platform. We present in detail each table of the database, accompanied by its specific attributes and their corresponding data types.By exploring these elements, we reveal how information is organized and stored within the system.

Each table is thoroughly examined, describing the data it stores and the crucial relationships between the different entities.

This in-depth analysis aims to provide a comprehensive understanding of how our platform manages students, teachers, courses, resources and other essential data, ensuring a solid foundation for a smooth and efficient user experience.

III.2 DESCRIPTION OF TABLES :

In the following we will provide a description that offers a detailed view of the

structure of the database used for our platform

Each table in the database is presented with a detailed description of its attributes, their meaning, and their usefulness in the context of the application. This section provides a better understanding of the key entities, their relationships, and the essential elements that form the foundation of the platform. By understanding the composition and meaning of each table, it becomes possible to more clearly understand the logic underlying data management within our website.

Table	Description	Primary/Foreign Key

users	Table containing the information of users(teacher , student) registered on the online education platform. It includes data such as the name, firstname, address,telephone number, email and password of the users.	**PK**:user_id **FK**:users_parent
role	A table consisting of a name and a ID that identifies the roles on the site.	**PK**:role_id
inscription	A table containing teachers' registration requests, including their personal information, such as their first name, date of birth, phone number, and many other pieces of information.	**PK**:teacher_id **FK**:teacher_status
inscription_sts	Table representing the results of registration requests for each teacher	**PK**:status_id
cv	Table containing ID and link to teacher ' CVs	**PK**:cv_id **FK**:teacher_cv
session	A table containing information about the class, including the title, explanation, price, date, and many other information.	**PK**:session_id **FK**:session_status session_teache session_module
session_sts	A table representing the status of the class by its ID and status, whether valid or expired.	**PK**:status_id
module	Table representing the subjects and represented by name and identifier	**PK**:module_id **FK**:module_level
level	Table representing the educational levels represented by name and identifier	**PK**:level_id

resource	A Table containing external lessons, exercises and exams.	**PK**:resource_id **FK**:resource_module uploaded_by resource_status
resource_sts	Table representing the status of external sources sold or not	**PK**:status_id
payment_resource	Table representing the purchase record for lessons	**FK ,PK**:resource_key download_by
payment_session	Table representing the purchase record for session	**PK,FK**:session_key attempted_by

III.3 DESCRIPTION OF ATTRIBUTES AND THEIR TYPES

Attribute	Data type	Description
users_id	INT	**Unique User identifier**
users_name	VARCHAR	**User Name**
users_firstname	VARCHAR	**User Firstname**
users_email	VARCHAR	**User Email**
users_password	VARCHAR	**User Password**
users_role	INT	**ID role associated with the user**
users_date_of_birth	DATE	**User Date**
users_address	VARCHAR	**User Address**
users_phone	VARCHAR	**User Phone**
users_image_link	VARCHAR	**User Image**
users_created_at	DATE	**User creation date**
users_bank_account	VARCHAR	**User Bank account**
users_parent	INT	**ID of the parent associated with theuser**

Users

Attribute	Data type	Description
level_id	**INT**	**Unique level identifier**
level_name	**VARCHAR**	**Level name**

Level

Attribute	Data type	Description
module_id	**INT**	**Unique module identifier**

module_name	VARCHAR	Module name
module_level	INT	ID level associated with the module

Module

Attribute	Data type	Description
resource_id	INT	Unique resource identifier
resource_title	VARCHAR	Resource title
resource_description	TEXT	Resource description
pdf_link	VARCHAR	Link of pdf (resource)
resource_module	INT	ID module associated with the resource
resource_price	FLOAT	Resource Price
uploaded_by	INT	ID user associated with the resource
resource_status	INT	ID resource_sts associated with the resource

Resource

Attribute	Data type	Description
status_id	INT	Unique resource identifier
resource_status	VARCHAR	Resource status

Resources status

Attribute	Data type	Description
resource_key	INT	ID resource associated with thePayment resource
download_by	INT	ID user associated with the payment resource
payment_date	DATE	Payment Date

Payment_Resource

Attribute	Data type	Description

session_id session_title session_description session_attempt session_price session_module session_status session_teacher session_date session_duration session_number_student	INT VARCHAR TEXT INT FLOAT INT INT INT DATE INTERVAL INT	Unique session identifier Session title Session description Session attempt Session price ID module associated with the session ID session_sts associated with the session ID user associated with the session Session duration Session number student

Session

Attribute	Data type	Description
status_id	INT	Unique session_sts identifier
session_status	VARCHAR	Session status

SESSION_STS

Attribute	Data type	Description
session_key	INT	ID session associated with the Payment session
attempted_by	INT	ID user associated with the Payment session
payment_date	DATE	Payment Date

PAYMENT_SESSION

Attribute	Data type	Description
teacher_id teache_name teacher_firstname teacher_email teacher_password cv_link teacher_date_of_birth	INT VARCHAR VARCHAR VARCHAR VARCHAR VARCHAR DATE	Unique session_sts identifier Teacher name Teacher firstname Teacher email Teacher password Cv link

teacher_status teacher_address teacher_phone teacher_image_link teacher_created_at teacher_bank_accout	INT VARCHAR VARCHAR VARCHAR DATE VARCHAR	Teacher date of birth ID inscription_sts associated with the inscription Teacher address Teacher phone Teacher image Teacher creation date Teacher bank account

INSCRIPTION

Attribute	Data type	Description
status_id	INT	Unique inscription_sts identifier
teacher_status	VARCHAR	Teacher status

INSCRIPTION_STS

CHAPTER 4

SQL QUERIES AND EXAMPLES

IV.1 INTRODUCTION :

The "SQL Queries and Examples" section highlights the practical use of SQL queries to interactwith the database dedicated to our DZ Teacher platform. It offers a series of concrete examples demonstrating the use of queries for operations such as retrieving, inserting, and modifying data. Each query is accompanied by a detailed explanation describing its purpose, its usefulness in the context of the application, and its contribution to the overall functionality of the system. This section aims to provide a practical understanding of the SQL interactions required to effectively manage data within our DZ Teacher application.

IV.2 TYPES OF SQL QUERIES :

IV.2.1 Data recovery :

select * from module where module_id = $1

. Explanation:

This SQL query searches for a specific module_id (represented as $1) in the module table. It retrieves all the columns of the module that matches the given module_id.

How Is This Query Used in the Website?

This query is used to ensure that the module selected by the user (for example, when uploading a resource or creating a session) exists in the database. By checking the module_id, the system can verify that the user is associating the new content with a valid, existing module.

select * from resource

Explanation:

This SQL query retrieves all columns from the resource table. It returns every record (or row) stored in the resource table, with each row representing a resource in the system.

How Is This Query Used in the Website?

This query is used to fetch and display all the available resources on the website, such as educational materials, PDFs, videos, etc. When users visit a section that lists resources (e.g., a learning material page), this query ensures that the system retrieves the data from the resource table to display the relevant resources to the users.

SELECT * FROM users

WHERE users_id = $1 AND users_role = 2;

Explanation:

This SQL query retrieves all columns from the users table where:

1. The users_id matches the placeholder value $1 (usually replaced with a specific ID at runtime).

2. The users_role equals 2, indicating a specific role (e.g., role ID 2 could represent an

teacher, predefined role in the system).

How Is This Query Used in the Website?

This query is typically used to:

- Verify and retrieve details of a specific user based on their unique ID (users_id) and role (users_role).
- Restrict access or provide specialized functionality to users with a specific role, such as teacher (role = 2).

IV.2.2 Data insertion :

INSERT INTO resource (resource_title, resource_description,pdf_link,resource_module, resource_price, uploaded_by, resource_status)

VALUES ($1, $2, $3, $4, $5, $6, $7)

RETURNING *;

Explanation:

This SQL query is used to insert a new record into the resource table with the following details:

1. resource_title: The title of the resource (e.g., name or subject of the resource).

2. resource_description: A brief description of the resource, explaining its purpose or

contents.

3. pdf_link: The link to the PDF file associated with the resource, likely stored in a file storage system.

4. resource_module: The module or category to which the resource belongs.

5. resource_price: The price of the resource (could be 0 for free resources).

6. uploaded_by: The ID of the user (or entity) who uploaded the resource.

7. resource_status: The status of the resource (e.g., active, inactive, or pending approval).

The RETURNING * clause retrieves the newly inserted record, including all columns, after the insertion is complete.

How Is This Query Used in the Website?

This query is typically used in features that allow users to upload resources, such as:

1. Uploading New Content: When a user adds a new resource (e.g., an educational material or document), this query stores the details in the database.

2. Confirming Insertion: The RETURNING * clause ensures that the system immediately retrieves and confirms the details of the newly added resource, which can be displayed back to the uploader or logged for administrative purposes.

```
INSERT INTO users (
users_name,
users_firstname,
users_email,
users_password,
users_role,
users_date_of_birth,
users_address,
users_phone,
users_image_link
)
VALUES ($1, $2, $3, $4, $5, $6, $7, $8, $9);
```

How Is This Query Used in the Website?

This query is typically executed when a new user is created, such as during:

1. User Registration: When a new user signs up, their information is captured from the website's registration form and inserted into the database.

2. Admin Addition of Users: Admins may use this to manually add users to the system, such as creating accounts for staff or special users.

IV.2.3 Data modification :

```
UPDATE session

SET session_status = 3

WHERE session_id = $1;
```

- **UPDATE session:** Specifies that the operation will modify data in the session table.
- **SET session_status = 3:** Changes the value of the session_status column to 3.
    - **session_status:** Likely represents the current state of the session. For example:
        - **1: published**
        - **2: finished**
        - **3: Canceled**

- **WHERE session_id = $1:** Targets the specific session record based on its uniqueidentifier, session_id. The placeholder $1 is replaced with the actual session ID when the query is executed.

```
UPDATE session

SET

session_title = $1,

session_description = $2,

session_attempt = $3,

session_price = $4,

session_module = $5,

session_status = $6,

session_date = $7,

session_duration = $8,
session_number_student = $9

WHERE session_id = $10

RETURNING *;
```

- **UPDATE session:** Specifies that this query updates records in the session table.
- **SET Clause:** Lists the columns to be updated and assigns new values to them using placeholders ($1, $2, etc.)
- **WHERE session_id = $10:** Ensures that only the record with the matching session_id (provided via $10) is updated.
- **RETURNING *:** After updating the record, this clause returns the updated row forconfirmation or further processing.

How Is This Query Used in the Website?

This query is used for updating details about an existing session. Examples include:

1. Editing Session Details: Allowing an admin or instructor to modify session information like title, description, price, or schedule.

2. Rescheduling or Status Updates: Changing the date, duration, or status of a session based on real-time requirements.

3. Enrollment Adjustments: Updating the number of students in response to enrollments or cancellations.

IV.2.4 Data deletion :

```
DELETE

        FROM inscription

        WHERE teacher_id = $1;
```

1. DELETE FROM inscription: Specifies that the query deletes rows from the inscription

table.

2. WHERE teacher_id = $1: Ensures that only the rows where the teacher_id column matches the value provided for $1 are deleted. This prevents accidental deletion of all records in the table.

How Is This Query Used in the Website?

1. Purpose:

a. To remove all records of inscriptions (registrations) linked to a specific teacher.

b. Useful in scenarios where a teacher's account is being deactivated, or their associated sessions are canceled.

2. Typical Scenarios:

- **a. Teacher Account Removal:** Deleting inscriptions tied to a teacher when they leave the platform.
- **b. Session Management:** Clearing inscriptions if a teacher no longer offers specific sessions.

3. Implications:

- **a. Data Consistency:** Ensures that registrations are cleaned up when a teacher is removed.
- **b. Avoid Orphan Data:** Prevents stale or irrelevant inscriptions from lingering in the database.

```
DELETE
FROM inscription
WHERE teacher_id = $1;
```

How Is This Query Used in a Website?

1. Purpose:

2. This query is often used to remove registrations (inscriptions) associated with a specific teacher. For example:

- a. If a teacher is removed from the platform.
- b. If a teacher’s sessions or services are no longer available.

3. Practical Use Case:

- a. When a teacher decides to leave the platform, their associated inscriptions are cleaned up to maintain data integrity.
- b. During administrative actions, such as clearing invalid or outdated inscriptions.

4. Impact:

a. Ensures the database does not retain irrelevant inscriptions tied to teachers no longer active.

b. Maintains a clean and consistent state in the application data.

IV.2.4 Search for data:

These SQL queries are used to filter data in the MySQL database to retrieve categories and articles matching the specified search term.

```
SELECT *,
        TO_CHAR(users_date_of_birth, 'DD') AS day_of_birth,
        TO_CHAR(users_date_of_birth, 'FMMonth') AS month_of_birth,
        TO_CHAR(users_date_of_birth, 'YYYY') AS year_of_birth
FROM users
WHERE users_id = $1;
```

How Is This Query Used in a Website?

1. Purpose:

a. This query is used to fetch user details, including a formatted breakdown of their date of birth (day, month, year).

2. Practical Use Cases:

a. Displaying user information on a profile page in a user-friendly format (e.g., "5 January 1990").

b. Enhancing visual representation of dates in dashboards or reports.

c. Simplifying backend logic by formatting date values directly in the query.

3. Benefits:

a. Reduces the need for additional formatting on the front end.

b. Ensures consistency in how dates are displayed throughout the website.

Chapter 5 : used tools

Languages and Libraries Used

- **JavaScript:** The primary language used for developing the frontend with React and handling backend logic with Express. JavaScript allows for dynamic interaction and is essential for building single-page applications (SPA).

- **SQL:** Used with MySQL for querying and managing the relational database. SQL is the language used to interact with and manage structured data in the backend

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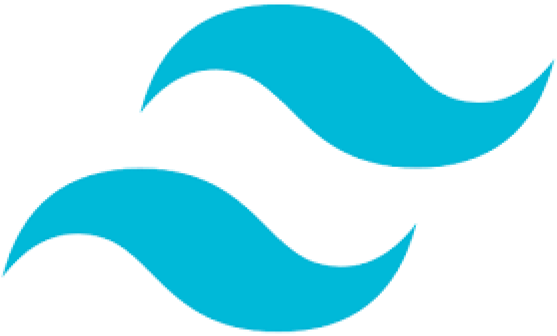
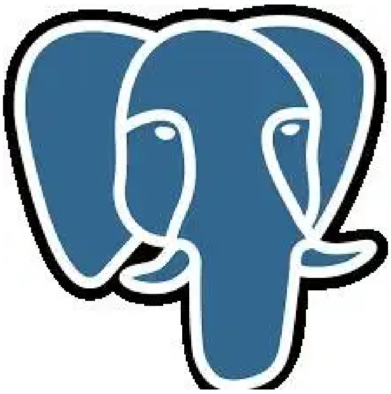
- **React Router:** A library used for handling routing in React applications, enabling navigation between different views or pages.

- **Tailwind CSS:** A utility-first CSS framework that provides pre-defined classes for rapid UI development, ensuring responsive and scalable designs.



- **PostgreSQL :**is an open-source, relational database management system (RDBMS) that uses SQL (Structured Query Language) to manage data. It is known for its reliability, scalability, and support for advanced features like transactions, foreign keys, and multi-version concurrency control.

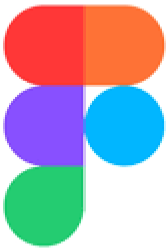


- **i18next:** A popular internationalization (i18n) framework used to enable multi-language support in the application, making it easier to translate content based on the user's locale.

Used Tools :

1. Figma

Figma was utilized for designing UI/UX elements, including wireframes and prototypes. It was essential in creating visual designs and collaborating on the layout and structure of the web application. Figma’s real-time collaboration and cloud-based platform made it easy for teams to share feedback and iterate on designs quickly.



2. Visual Studio Code (VS Code)

Visual Studio Code was the primary text editor for development. Its wide range of extensions, including code formatting, debugging tools, and Git integration, helped improve coding efficiency. The editor's flexibility allowed for seamless work with React, Express, and other technologies.

3. Visual Paradigm

Visual Paradigm was used for planning and diagramming. It was helpful in mapping out the system architecture, designing database schemas, and generating flowcharts for the application. Visual Paradigm assisted in ensuring clarity and maintaining a well-organized structure for the project.

4. GitHub

GitHub played a crucial role in version control, enabling collaboration across multiple developers. It allowed for managing the project's codebase efficiently, implementing pull requests, tracking changes, and ensuring proper code review before deployment. GitHub's integration with CI/CD pipelines streamlined the development and deployment processes.

5. Docker

Docker was used for containerization, ensuring that the development environment could be replicated consistently across different stages of the project lifecycle. By creating isolated containers, Docker helped in managing dependencies, reducing the "it works on my machine" issue, and ensuring the application runs smoothly in production.

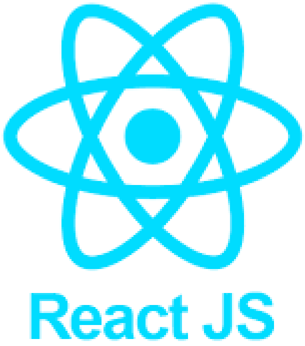
Frameworks and Technologies Used

1. Express.js

- **Express.js** is a lightweight and robust web application framework for **Node.js** that simplifies the development of server-side applications. It facilitates the creation of RESTful APIs, dynamic web applications, and microservices by providing built-in features like routing, middleware integration, and HTTP utility methods. Express's minimalistic approach ensures flexibility and scalability, making it the perfect framework for building production-grade applications quickly and efficiently.

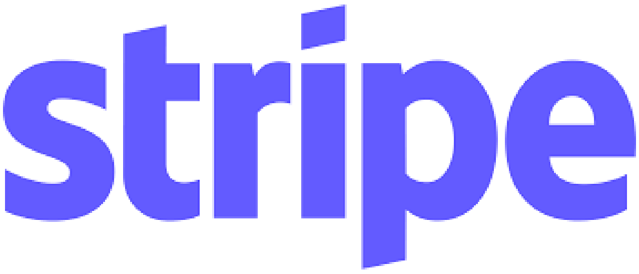
2. React.js

- **React.js** is a powerful front-end JavaScript library for building interactive user interfaces, especially for single-page applications (SPAs). React enables the creation of reusable components that efficiently update and render data as user interactions occur. It uses a virtual DOM for faster rendering and offers a component-based architecture, which makes it a go-to solution for building modern, responsive UIs.

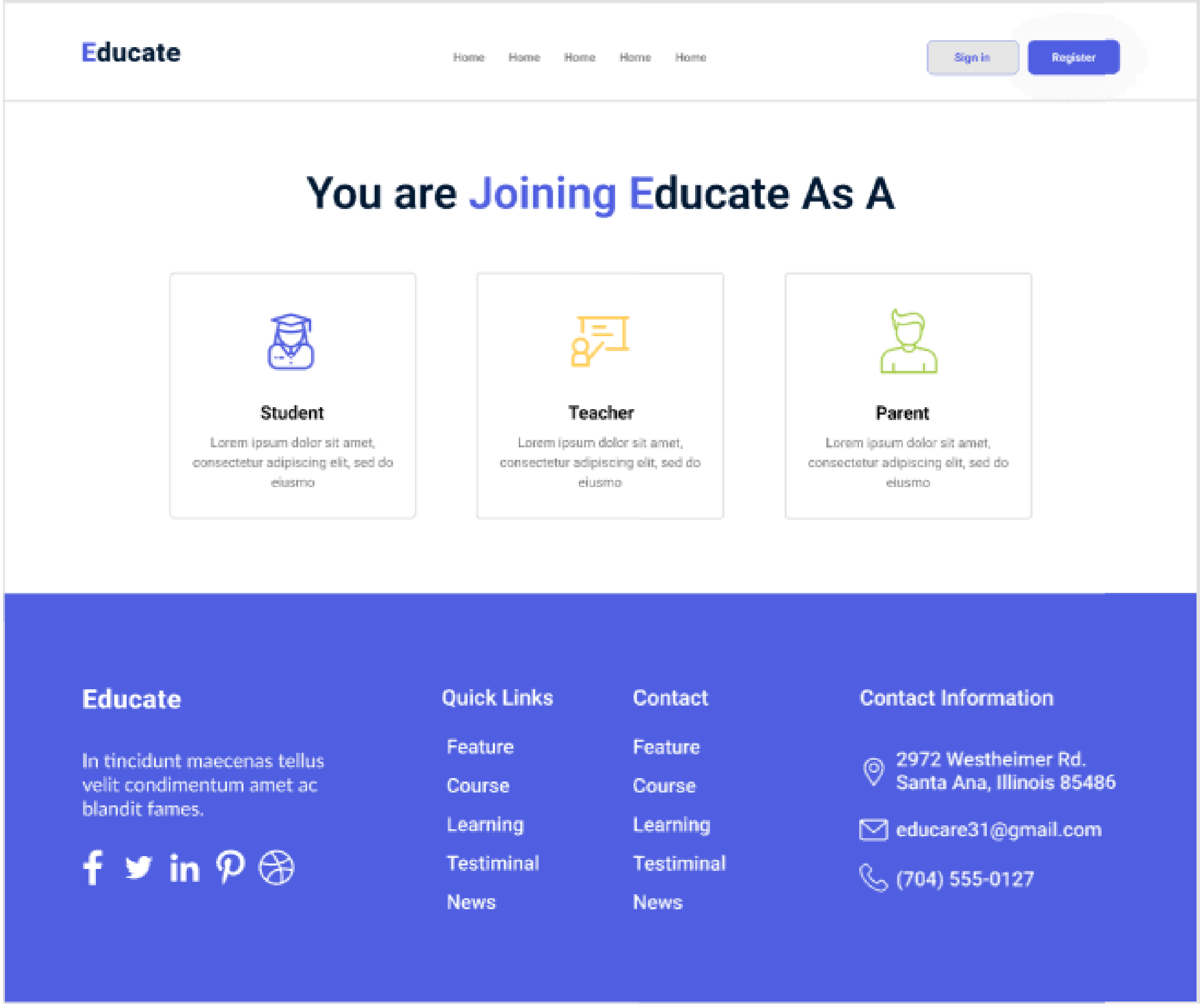


3. Stripe

Stripe is a widely-used payment gateway API that allows businesses to accept payments online securely. It provides tools for integrating payment systems into web applications with ease. With **Stripe**, users can make payments using credit cards, wallets, and other online payment methods. It supports features like subscription billing, invoicing, and fraud protection, making it a comprehensive solution for managing payments.



Chapter 6 : Screen Shots



You are Joining Educate As A

Student

Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmo

Teacher

Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmo

Parent

Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmo

Educate

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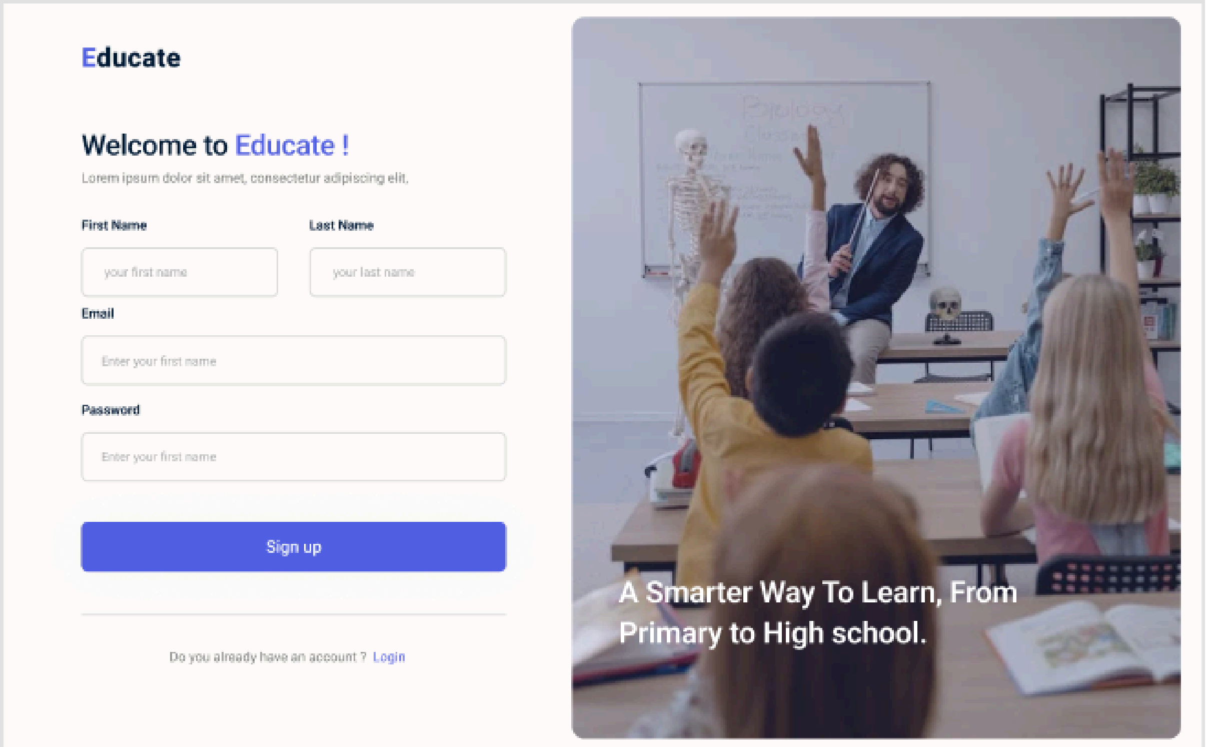
Contact Information

2972 Westheimer Rd.
Santa Ana, Illinois 85486

educare31@gmail.com

(704) 555-0127

Figure 9.1 – before sign in/register interface



Educate

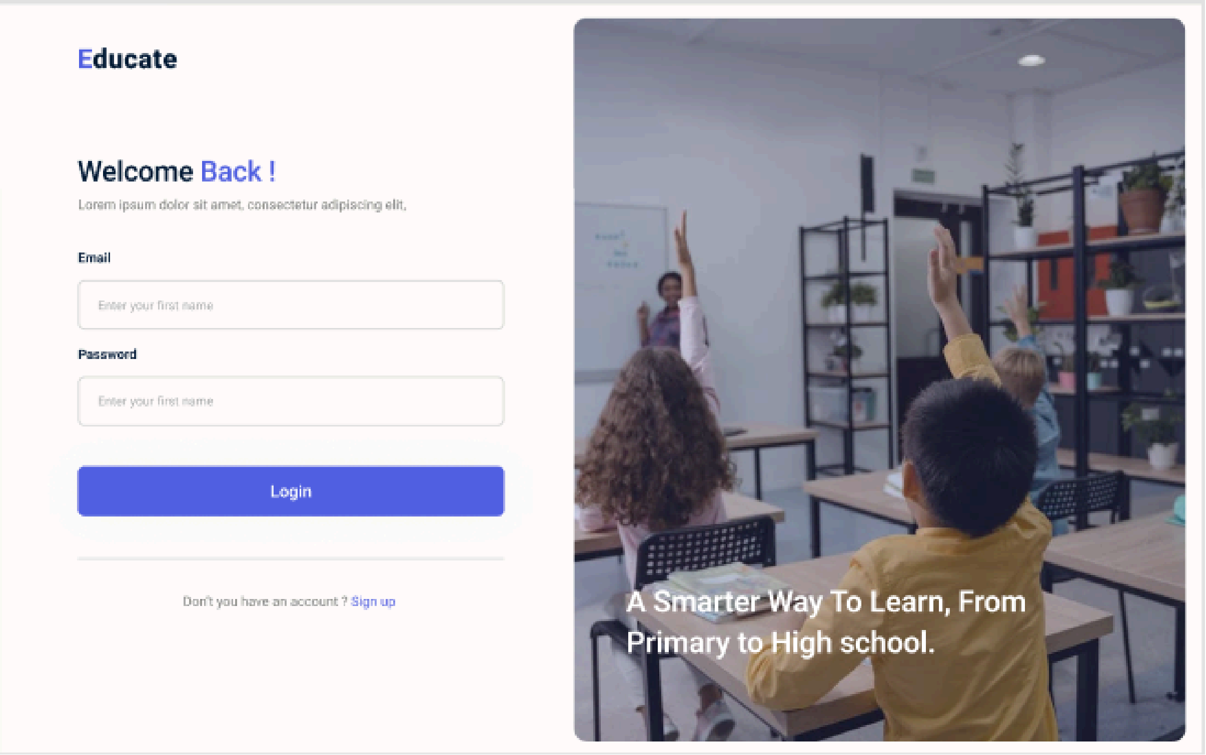
Welcome to Educate !

Lorem ipsum dolor sit amet, consectetur adipiscing elit.

Do you already have an account ? Login

A Smarter Way To Learn, From Primary to High school.

Figure 9.2 – sign up page



Educate

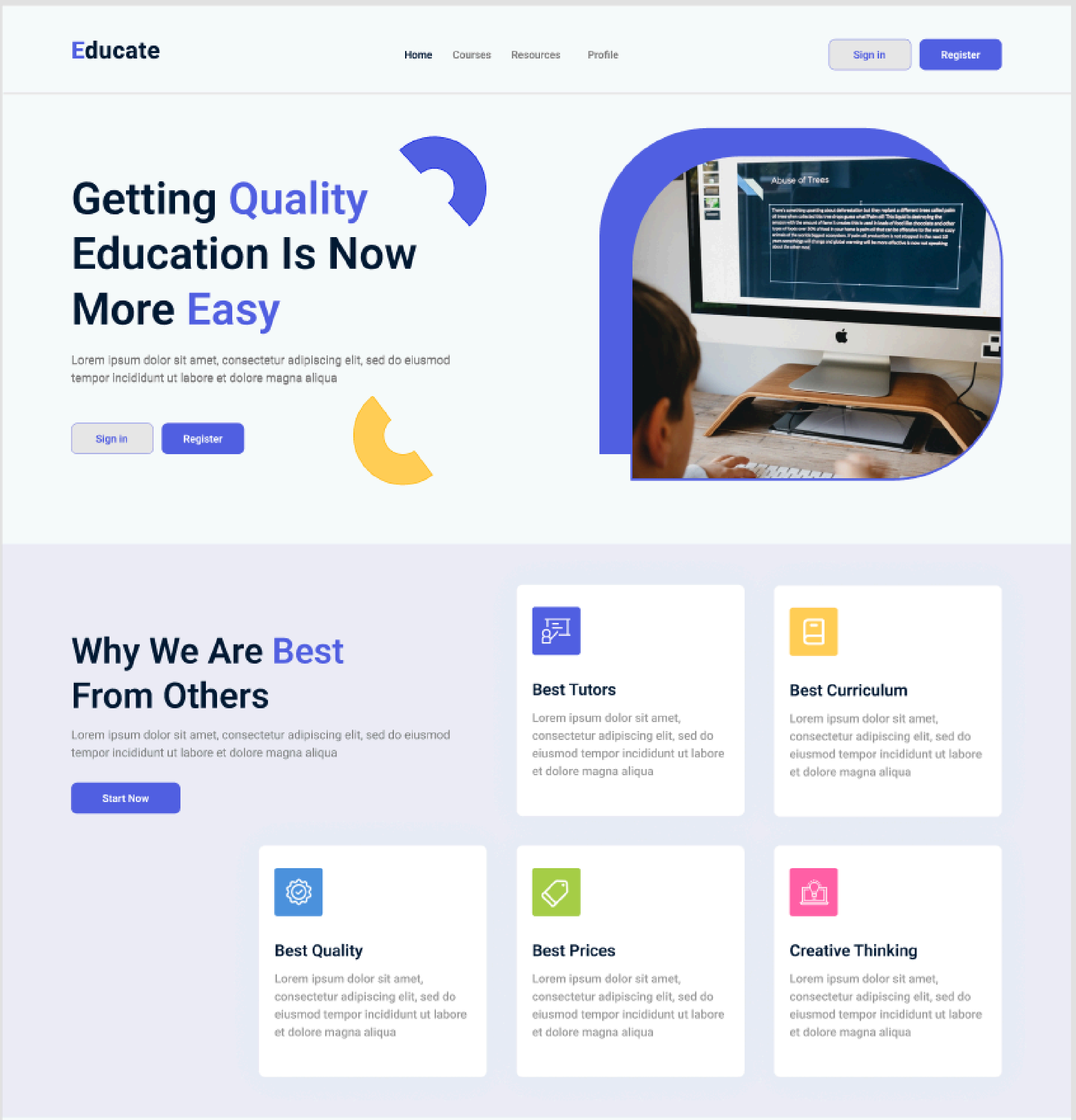
Welcome Back !

Lorem ipsum dolor sit amet, consectetur adipiscing elit.

Don't you have an account ? Sign up

A Smarter Way To Learn, From Primary to High school.

Figure 9.3 – login page



Educate

Home Courses Resources Profile

Sign in Register

Getting Quality Education Is Now More Easy

Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua

Sign in Register

Why We Are Best From Others

Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua

Start Now

Best Tutors

Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua

Best Curriculum

Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua

Best Quality

Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua

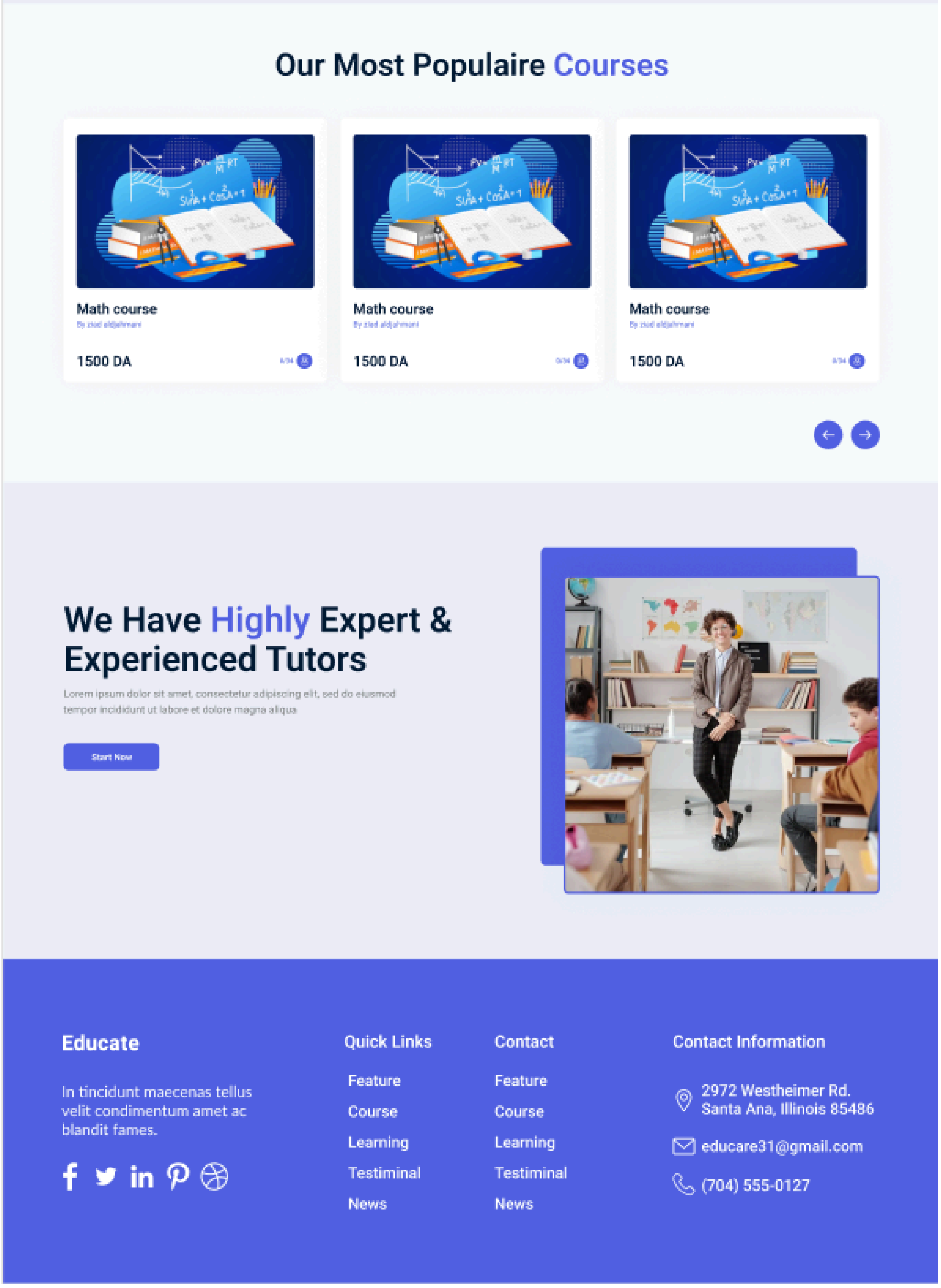
Best Prices

Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua

Creative Thinking

Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua

Figure 9.4 – Home page 1 : about us



Our Most Populaire Courses

Math course
By ziad aldjahmani
1500 DA

Math course
By ziad aldjahmani
1500 DA

Math course
By ziad aldjahmani
1500 DA

We Have Highly Expert & Experienced Tutors

Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua

Educate

In tincidunt maecenas tellus velit condimentum amet ac blandit fames.

Contact Information

2972 Westheimer Rd.
Santa Ana, Illinois 85486

educare31@gmail.com

(704) 555-0127

Figure 9.5 – Home page 2 : our populaire courses and inscription functionality

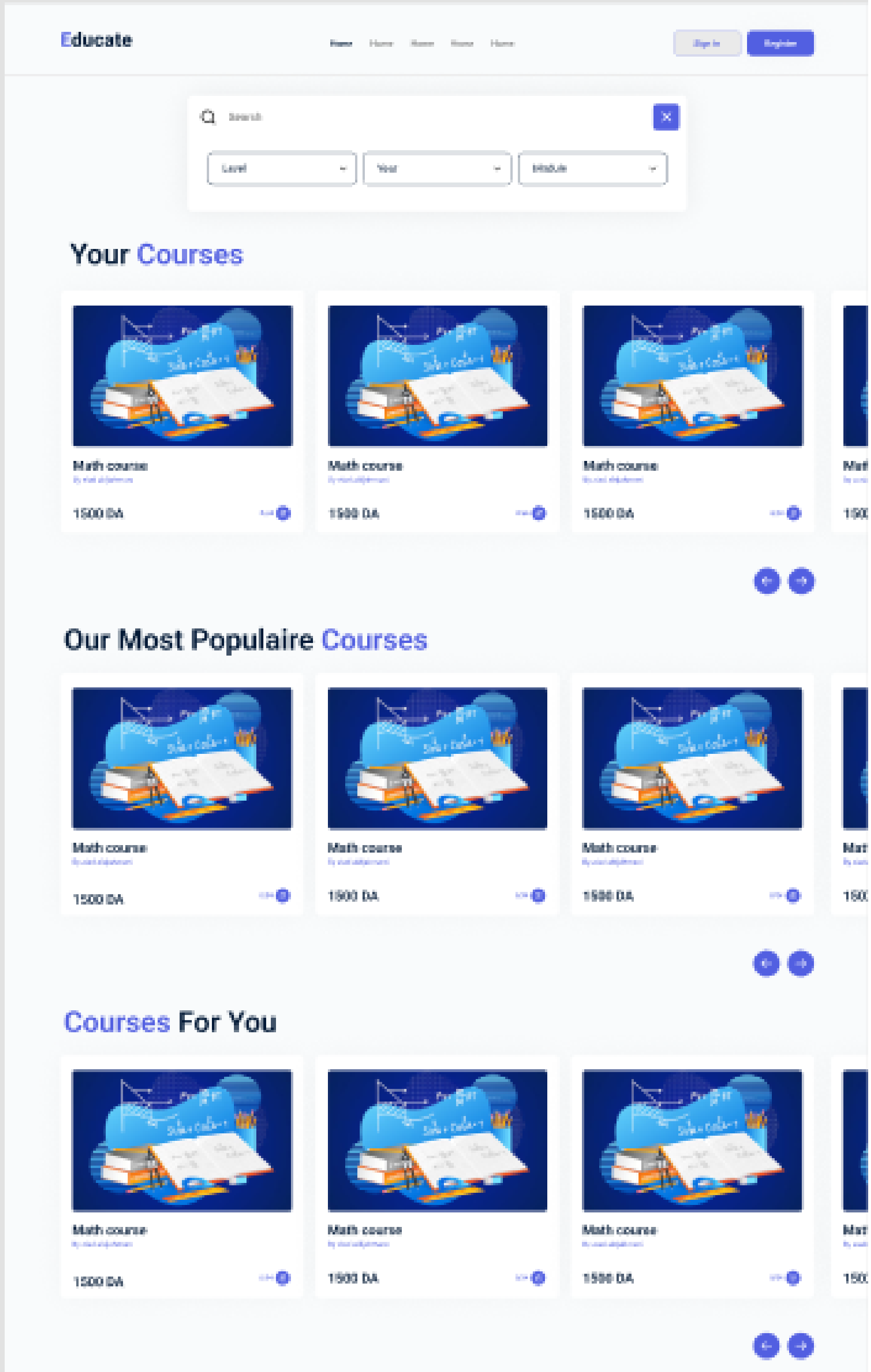
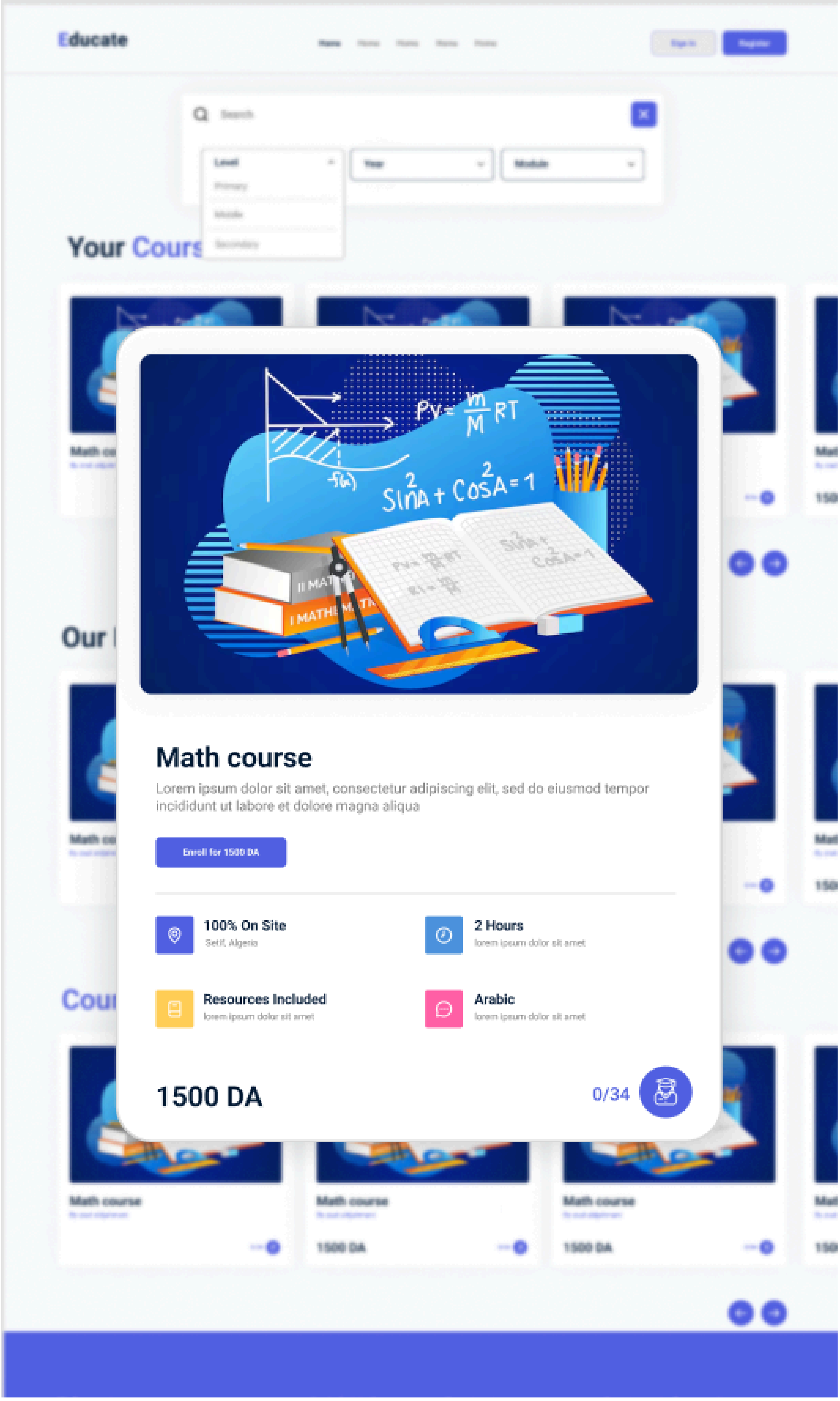


Figure 9.6 – courses page 1 : filtered search



Math course

Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua

100% On Site
Setif, Algeria

2 Hours
lorem ipsum dolor sit amet

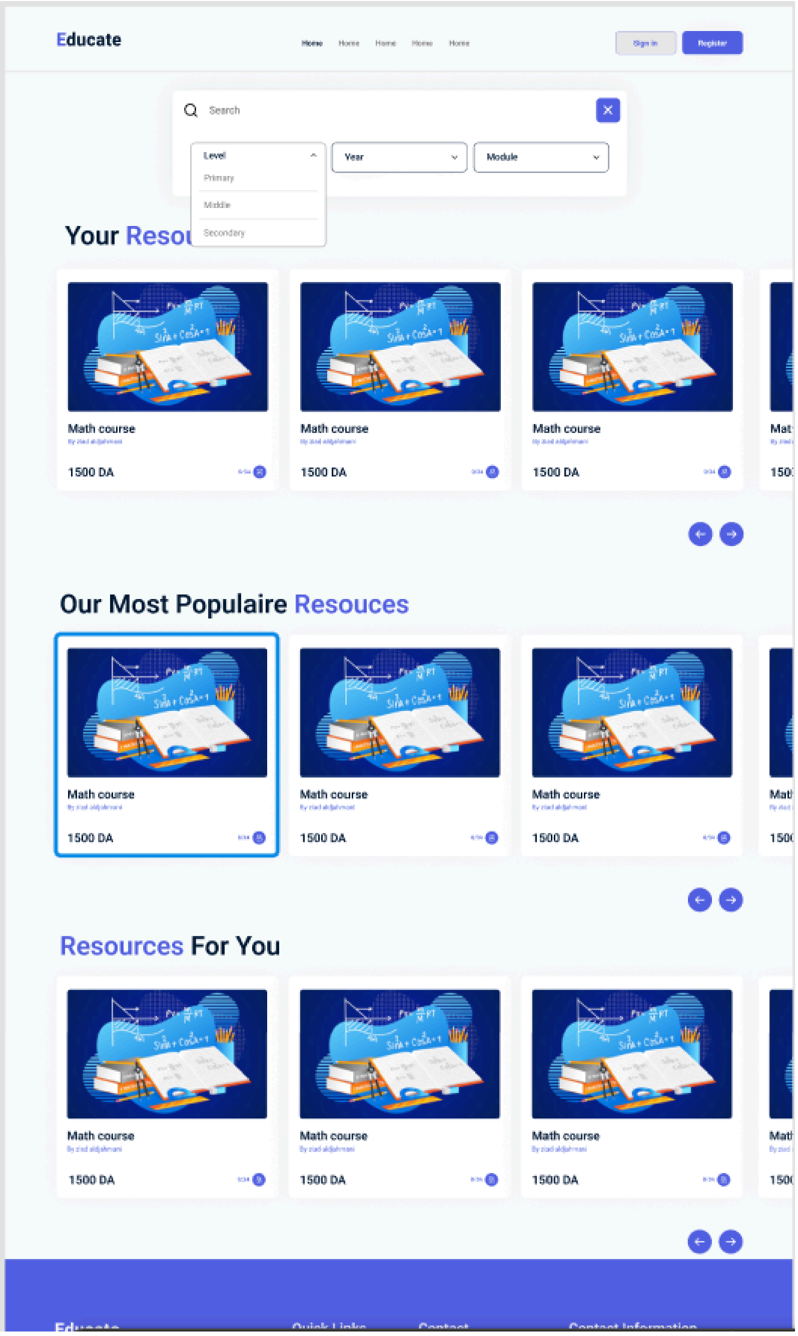
Resources Included
lorem ipsum dolor sit amet

Arabic
lorem ipsum dolor sit amet

1500 DA

0/34

Figure 9.7 – courses page 2 : showing course informations



Your Resou

Math course

1500 DA

Math course

1500 DA

Math course

1500 DA

Our Most Populaire Resouces

Math course

1500 DA

Math course

1500 DA

Math course

1500 DA

Resources For You

Math course

1500 DA

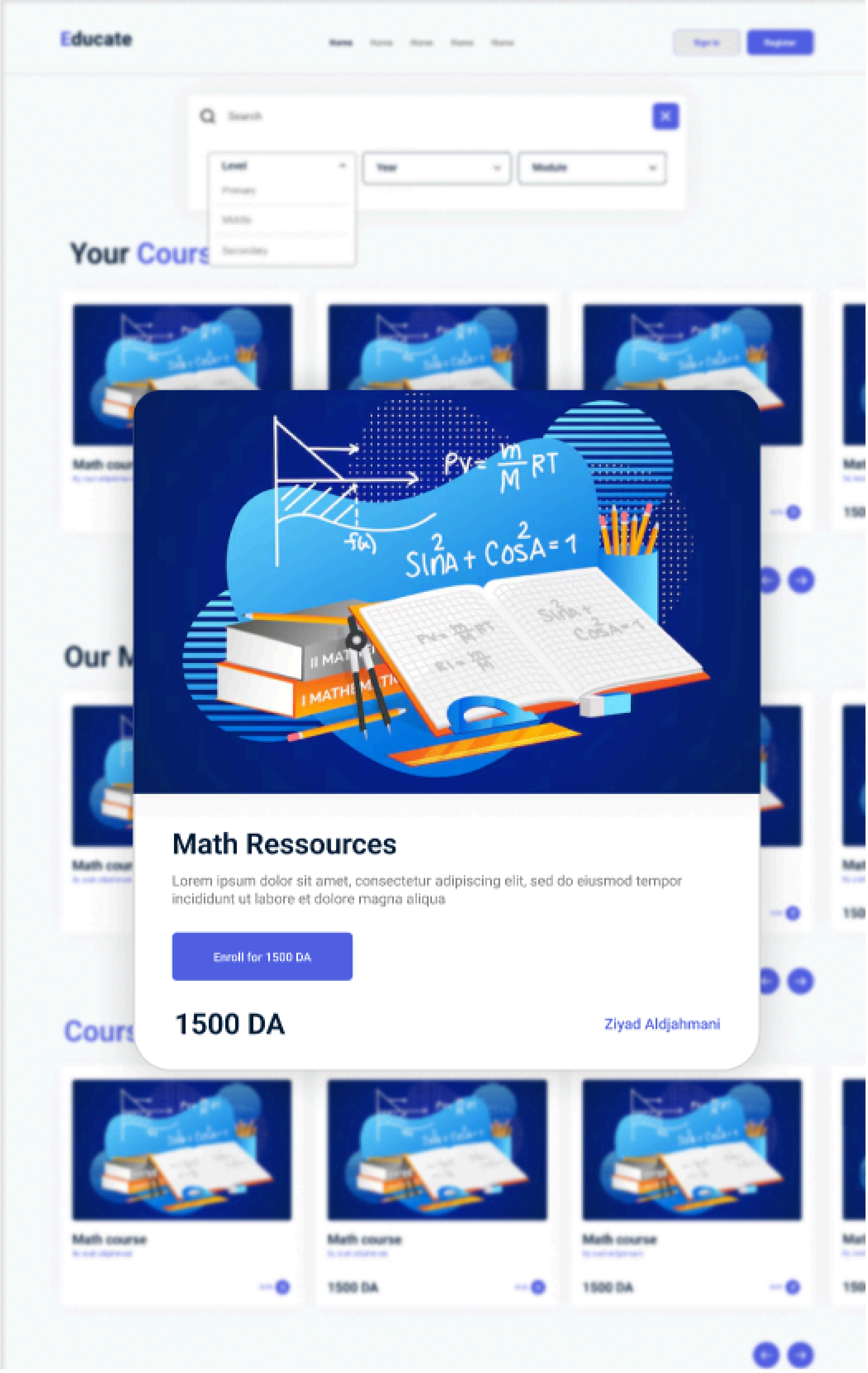
Math course

1500 DA

Math course

1500 DA

Figure 9.8 – resources page 1 : filtered search



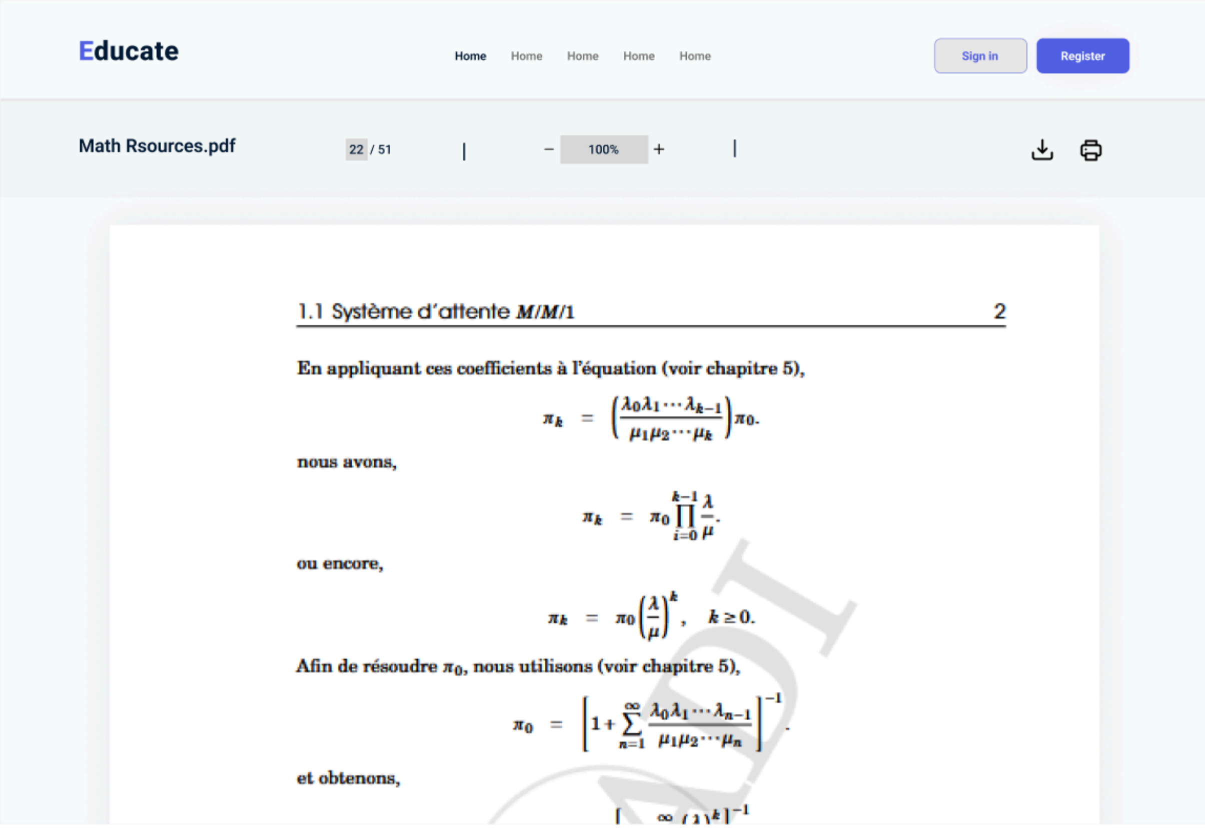
Math Ressources

Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua

1500 DA

Ziyad Aldjahmani

Figure 9.9 – Resources page 2 : showing Resource informations



1.1 Système d'attente $M/M/1$ 2

En appliquant ces coefficients à l'équation (voir chapitre 5),

$$\pi_k = \left(\frac{\lambda_0\lambda_1\cdots\lambda_{k-1}}{\mu_1\mu_2\cdots\mu_k}\right)\pi_0.$$

nous avons,

$$\pi_k = \pi_0\prod_{i=0}^{k-1}\frac{\lambda}{\mu}.$$

ou encore,

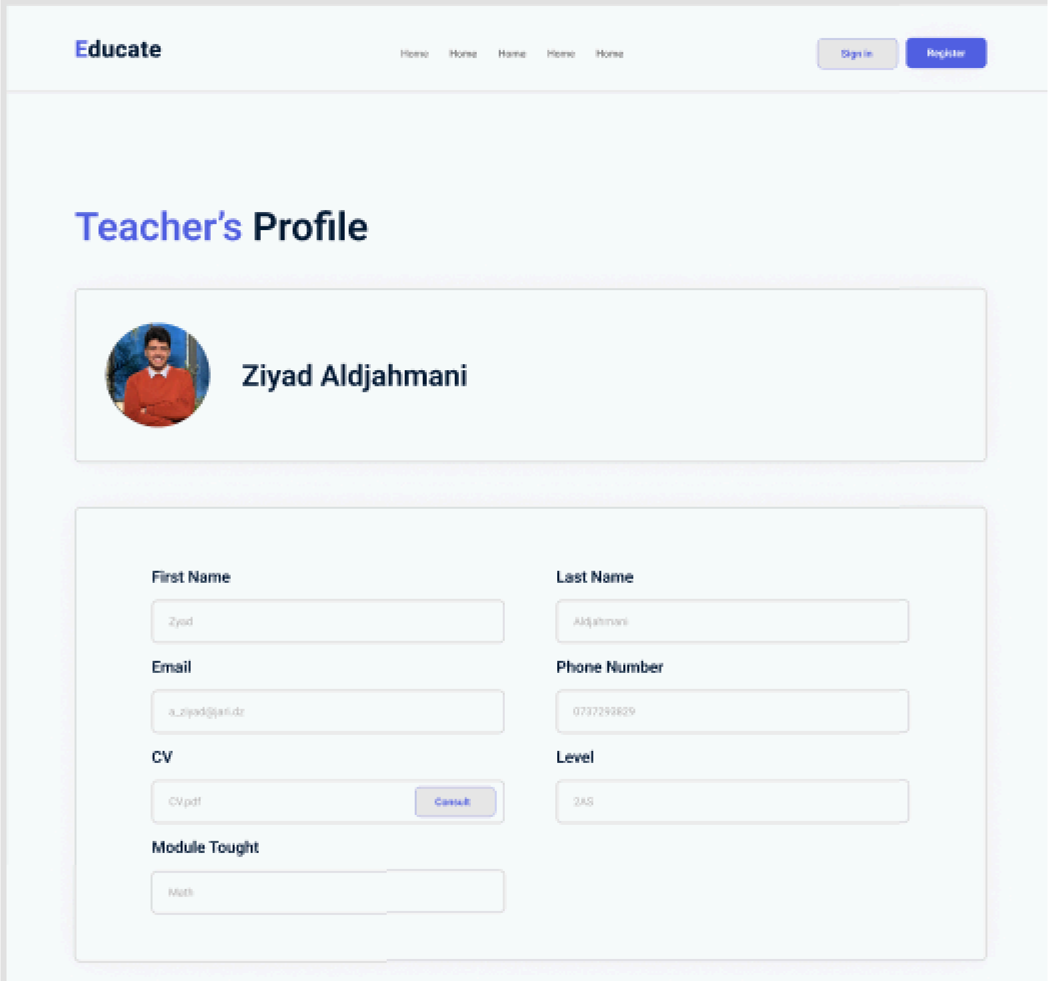
$$\pi_k = \pi_0\left(\frac{\lambda}{\mu}\right)^k, \quad k \geq 0.$$

Afin de résoudre π_0, nous utilisons (voir chapitre 5),

$$\pi_0 = \left[1+\sum_{n=1}^{\infty}\frac{\lambda_0\lambda_1\cdots\lambda_{n-1}}{\mu_1\mu_2\cdots\mu_n}\right]^{-1}.$$

et obtenons,

Figure 9.10 – Resources page 3 : Pdf reader for Student's Resources

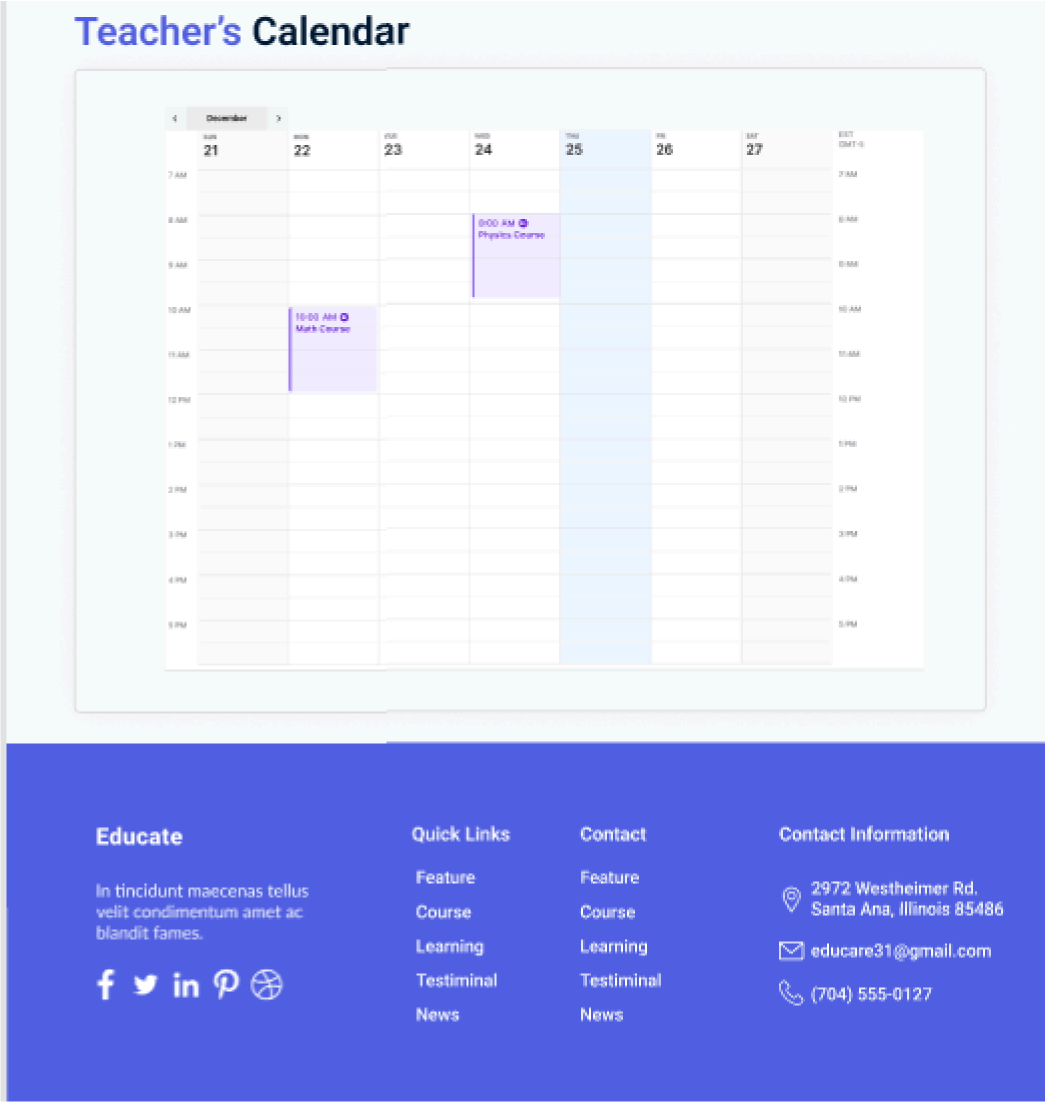


Teacher's Profile

Ziyad Aldjahmani

First Name Zyad	Last Name Aldjahmani
Email a_ziyad@jari.dz	Phone Number 0737293829
CV CV.pdf	Level 2AS
Module Tought Math	

Figure 9.11– Viewing Teacher's Profile and Qualifications



Teacher's Calendar

Educate

In tincidunt maecenas tellus velit condimentum amet ac blandit fames.

Quick Links

- Feature
- Course
- Learning
- Testiminal
- News

Contact

- Feature
- Course
- Learning
- Testiminal
- News

Contact Information

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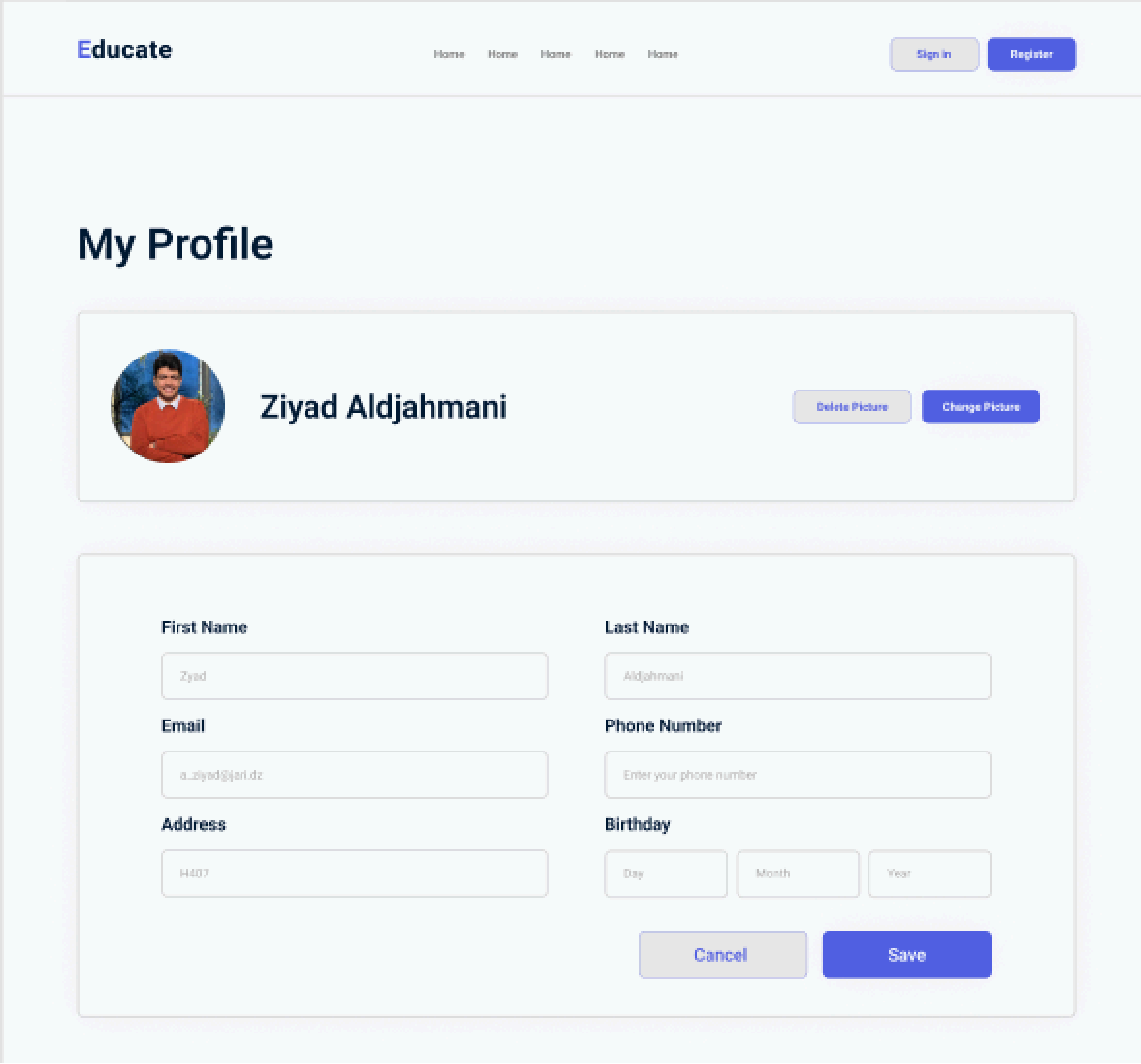
Santa Ana, Illinois 85486

educare31@gmail.com

(704) 555-0127

Figure 9.12 – viewing Teacher's disponibility through a Calendar



My Profile

Ziyad Aldjahmani

First Name

Zyad

Last Name

Aldjahmani

Email

a_ziyad@jari.dz

Phone Number

Enter your phone number

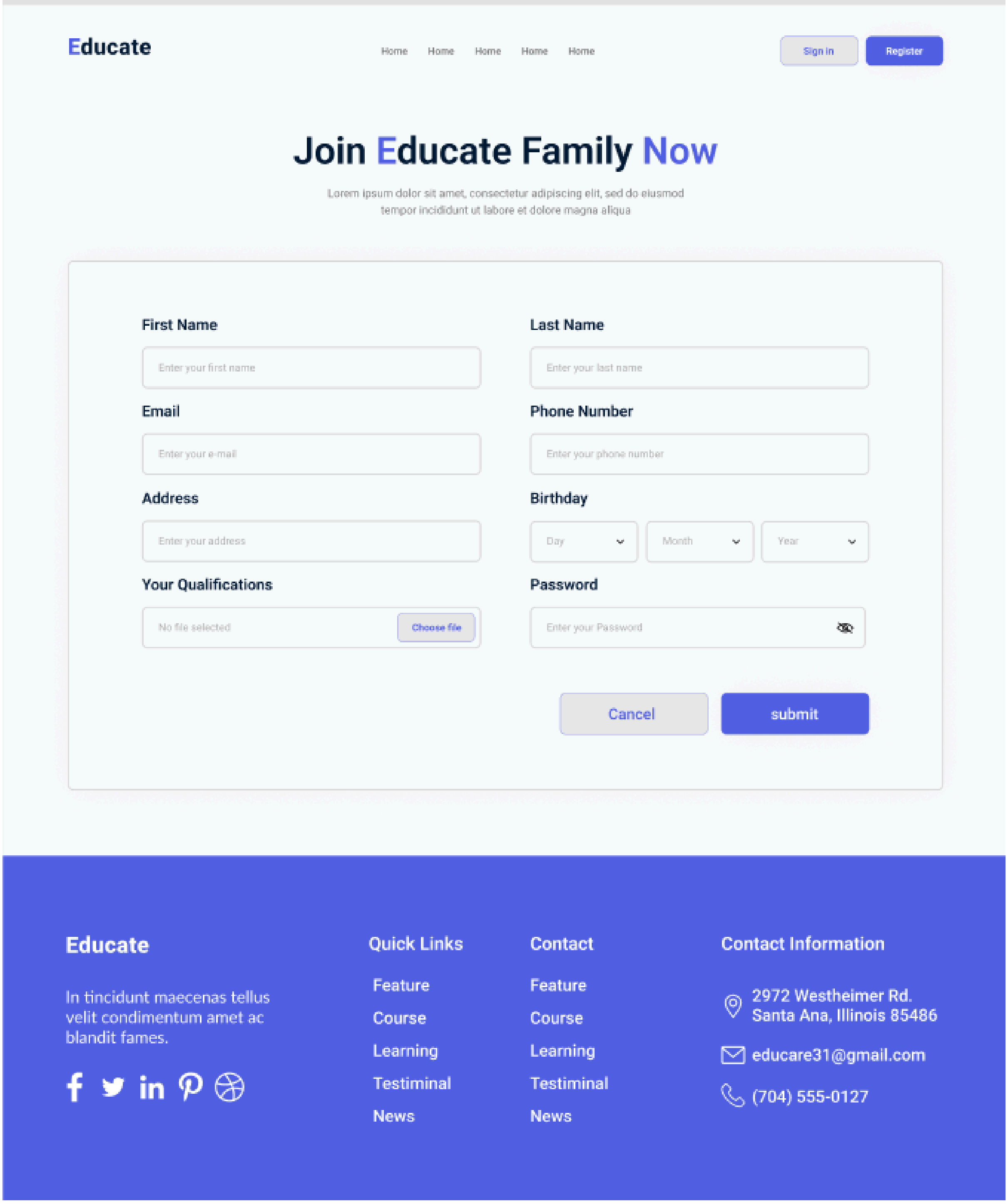
Address

H407

Birthday

Day Month Year

Figure 9.13– Student Profile



Join Educate Family Now

Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod
tempor incididunt ut labore et dolore magna aliqua

First Name
Enter your first name

Last Name
Enter your last name

Email
Enter your e-mail

Phone Number
Enter your phone number

Address
Enter your address

Birthday
Day
Month
Year

Your Qualifications
No file selected

Password
Enter your Password

Educate

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Quick Links
Feature
Course
Learning
Testiminal
News

Contact
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Contact Information

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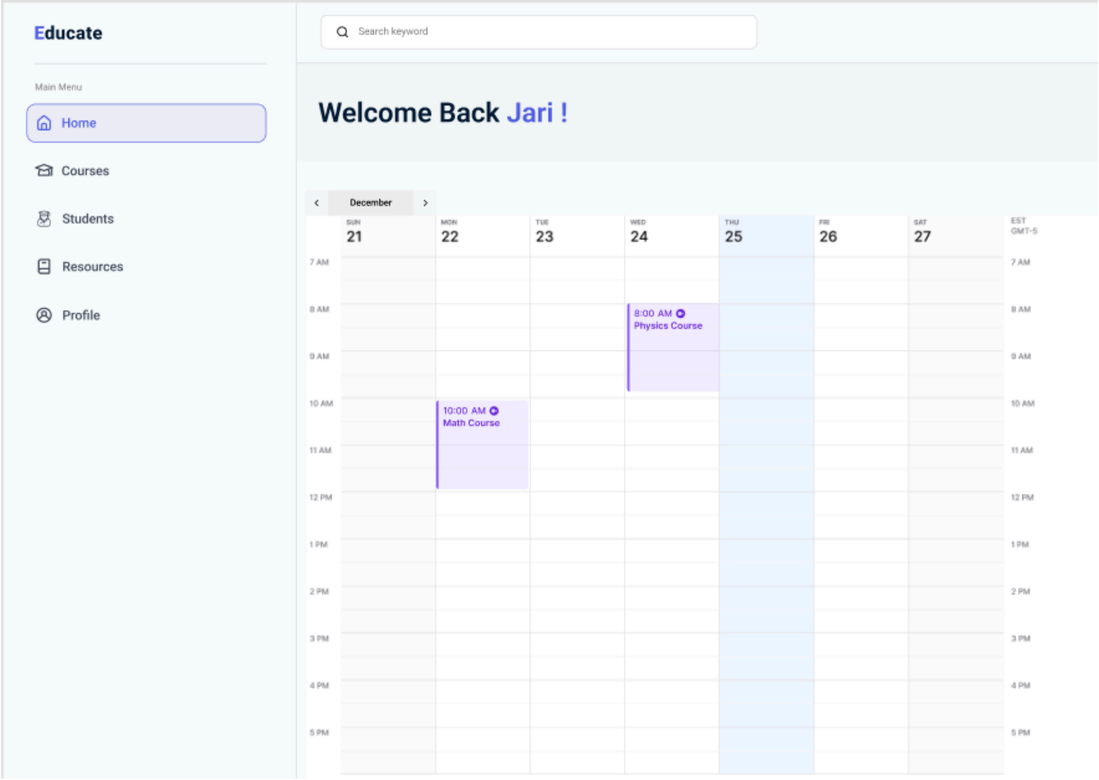
Santa Ana, Illinois 85486

educare31@gmail.com

(704) 555-0127

Figure 9.14– Page For Teacher’s Application To work With Us

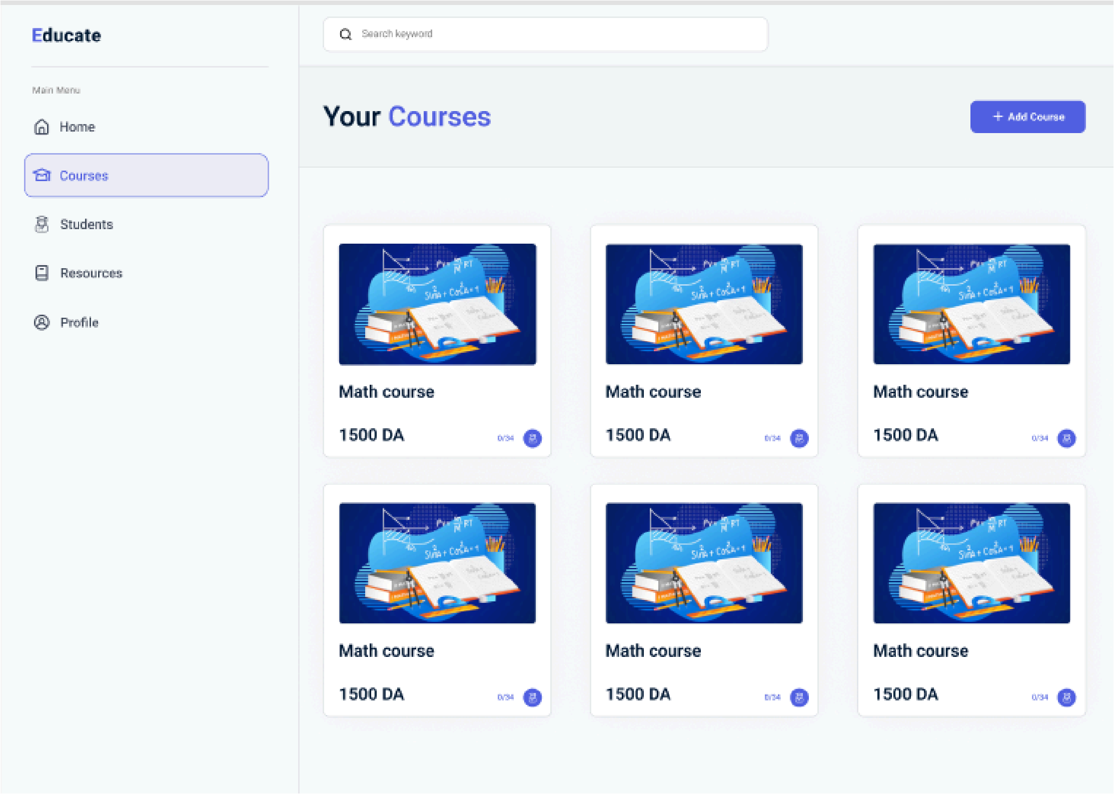


Welcome Back Jari !

8:00 AM Physics Course

10:00 AM Math Course

Figure 9.15– Teacher's Home Page : Displaying Calendar for Teacher



Your Courses

Math course
1500 DA 0/34

Math course
1500 DA 0/34

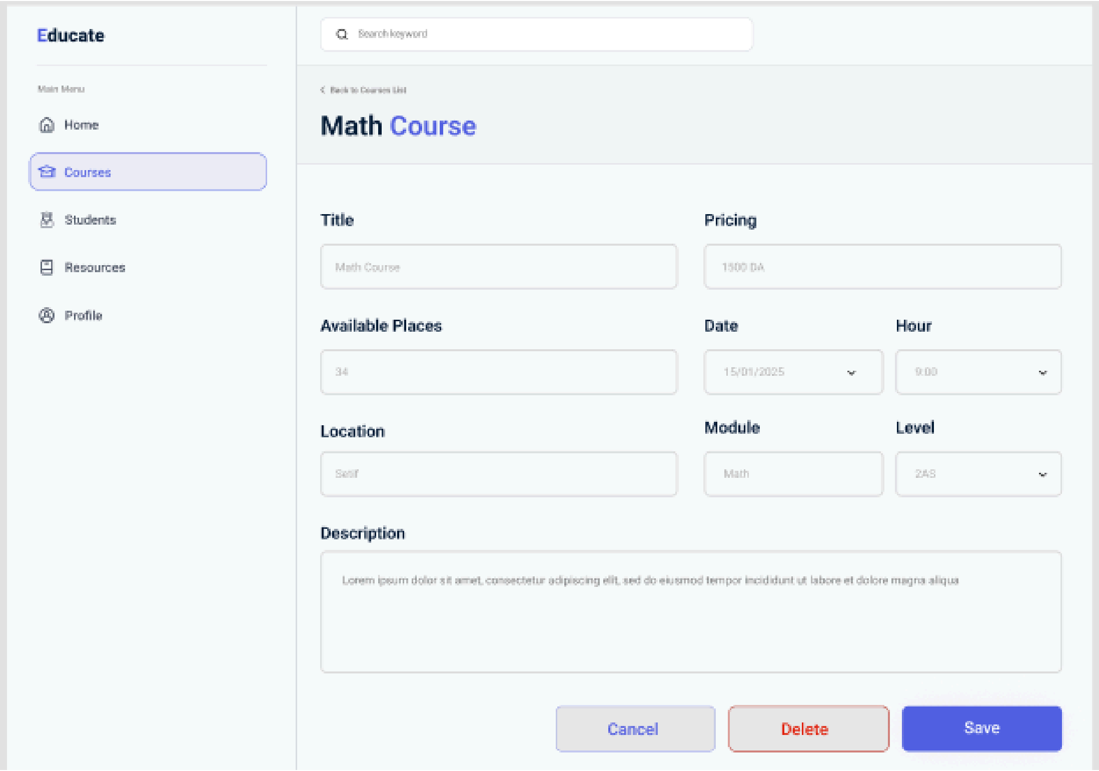
Math course
1500 DA 0/34

Math course
1500 DA 0/34

Math course
1500 DA 0/34

Math course
1500 DA 0/34

Figure 9.16–Teacher’s Courses Page : Displaying Teacher’s Courses with the ability to add new or edit courses



Title: Math Course

Pricing: 1500 DA

Available Places: 34

Date: 15/01/2025

Hour: 9:00

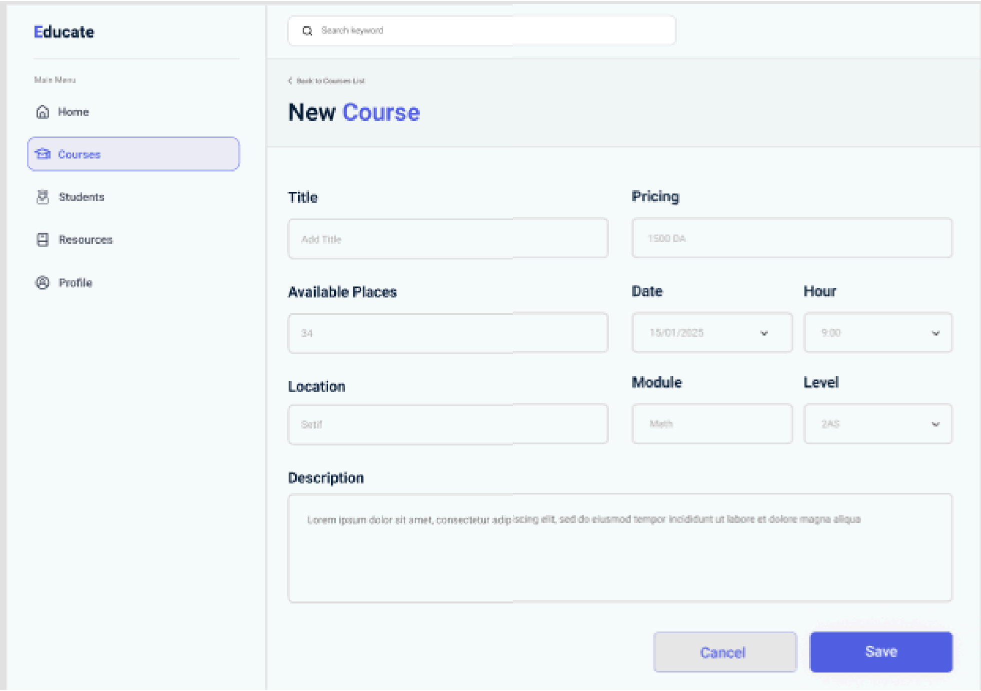
Location: Setif

Module: Math

Level: 2AS

Description: Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua

Figure 9.17–Teacher’s Courses Page2 : Teacher Editing an existing Course



Title: Add Title

Pricing: 1500 DA

Available Places: 34

Date: 15/01/2025

Hour: 9:00

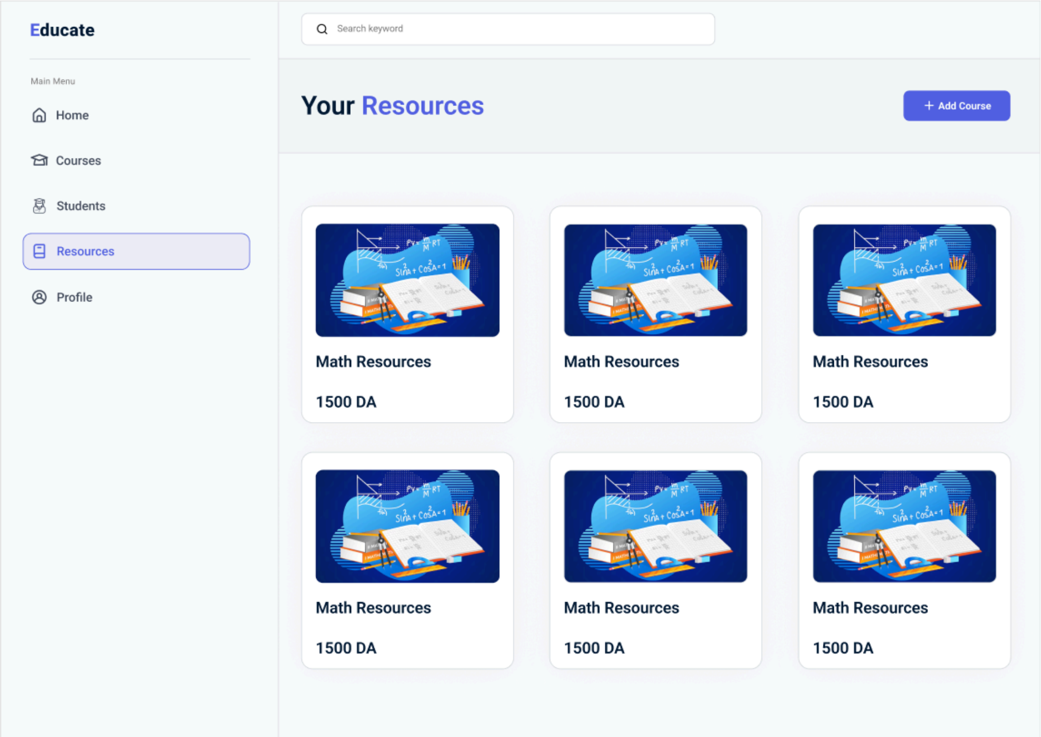
Location: Setif

Module: Math

Level: 2AS

Description: Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua

Figure 9.18–Teacher’s Courses Page3 : Teacher Adding New Course



Your Resources

Math Resources

1500 DA

Math Resources

1500 DA

Math Resources

1500 DA

Math Resources

1500 DA

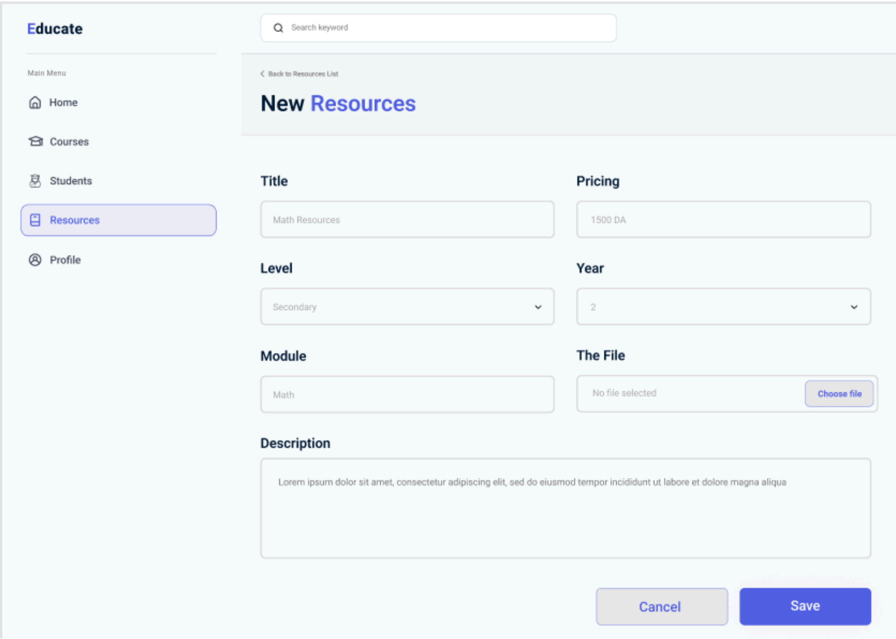
Math Resources

1500 DA

Math Resources

1500 DA

Figure 9.19–Teacher’s Resources Page : Displaying Teacher’s Resources with the ability to add new or edit existing Resources



New Resources

Title: Math Resources

Pricing: 1500 DA

Level: Secondary

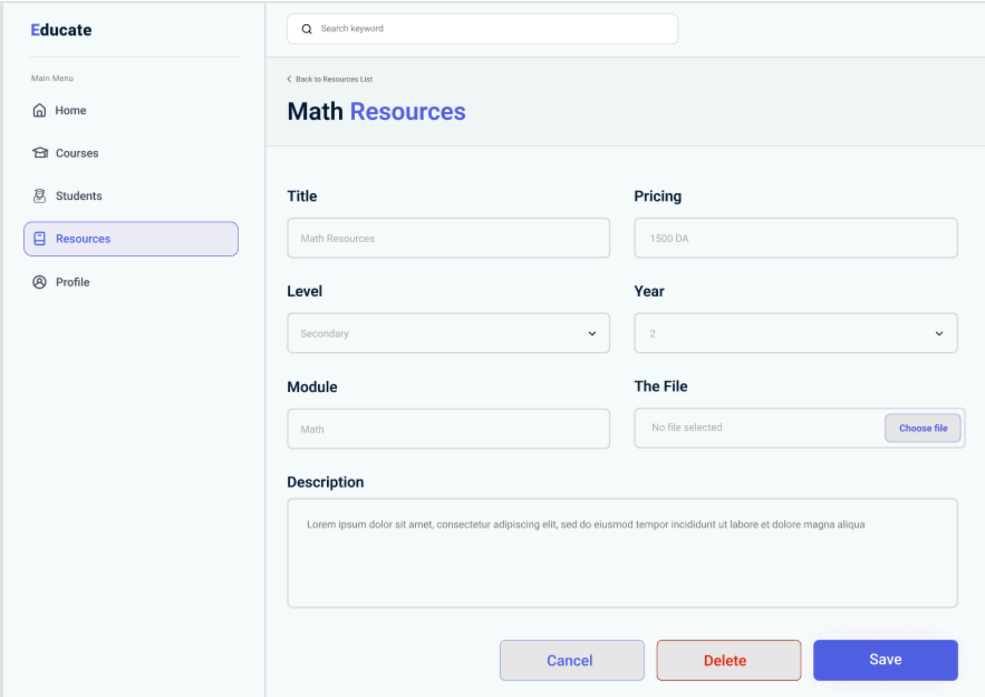
Year: 2

Module: Math

The File: No file selected

Description: Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua

Figure 9.20–Teacher's Resources Page3 : Teacher Adding new Resources



Math Resources

Title: Math Resources

Pricing: 1500 DA

Level: Secondary

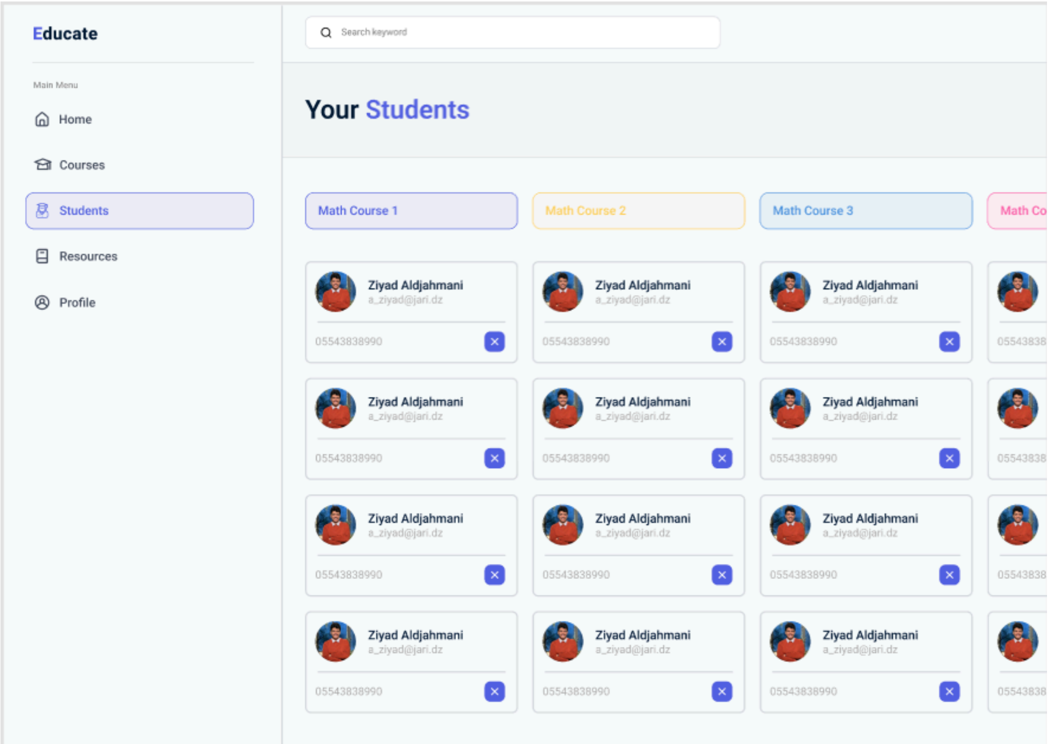
Year: 2

Module: Math

The File: No file selected Choose file

Description: Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua

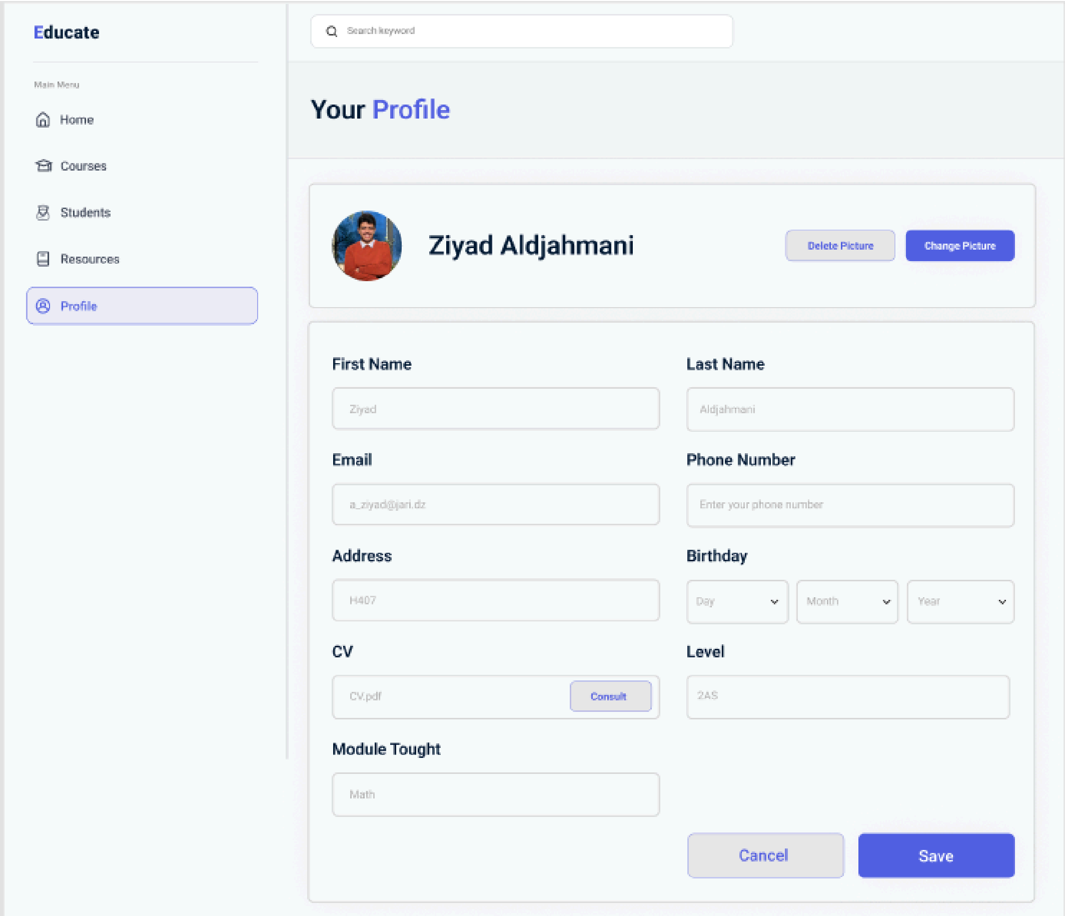
Figure 9.21–Teacher's Resources Page3 : Teacher Editing an existing Resources



Your Students

Math Course 1	Math Course 2	Math Course 3	Math Co
Ziyad Aldjahmani a_ziyad@jari.dz 05543838990	Ziyad Aldjahmani a_ziyad@jari.dz 05543838990	Ziyad Aldjahmani a_ziyad@jari.dz 05543838990	05543838
Ziyad Aldjahmani a_ziyad@jari.dz 05543838990	Ziyad Aldjahmani a_ziyad@jari.dz 05543838990	Ziyad Aldjahmani a_ziyad@jari.dz 05543838990	05543838
Ziyad Aldjahmani a_ziyad@jari.dz 05543838990	Ziyad Aldjahmani a_ziyad@jari.dz 05543838990	Ziyad Aldjahmani a_ziyad@jari.dz 05543838990	05543838
Ziyad Aldjahmani a_ziyad@jari.dz 05543838990	Ziyad Aldjahmani a_ziyad@jari.dz 05543838990	Ziyad Aldjahmani a_ziyad@jari.dz 05543838990	05543838

Figure 9.22 – Teacher's students Page : Displaying Teacher's students registered in His Courses With the Ability To Remove



Your Profile

Ziyad Aldjahmani

First Name: Ziyad

Last Name: Aldjahmani

Email: a_ziyad@jari.dz

Phone Number: Enter your phone number

Address: H407

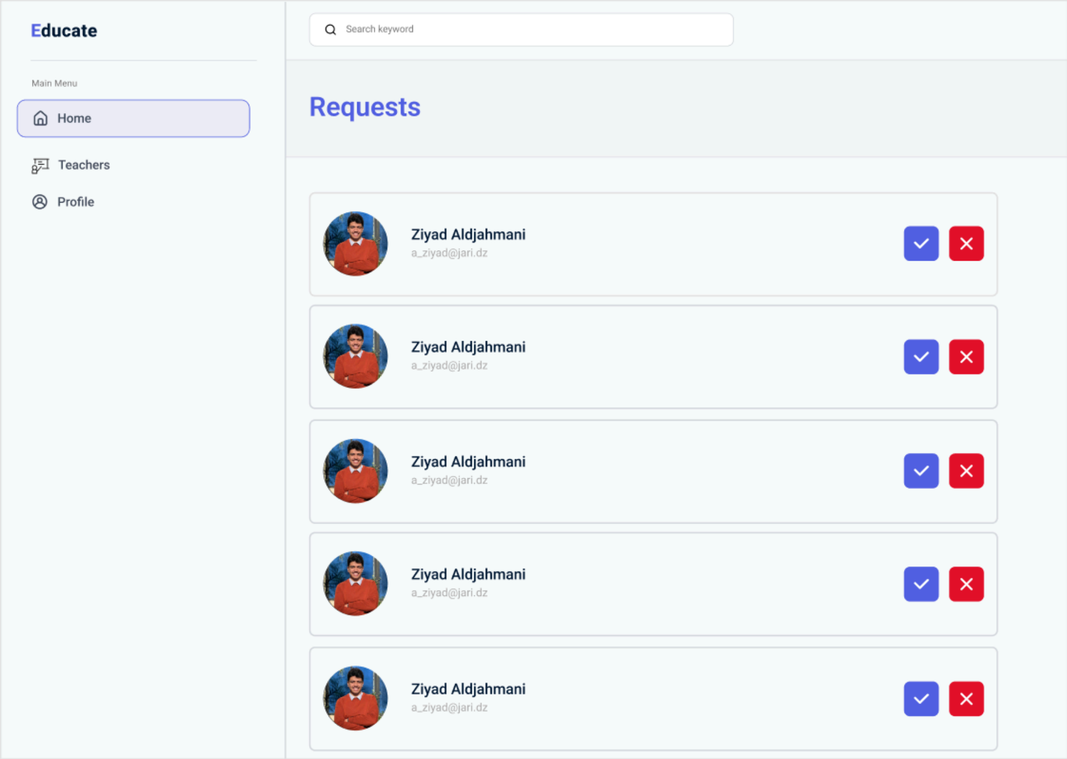
Birthday: Day Month Year

CV: CV.pdf

Level: 2AS

Module Tought: Math

Figure 9.23 – Teacher's Profile



Requests

Ziyad Aldjahmani
a_ziyad@jari.dz

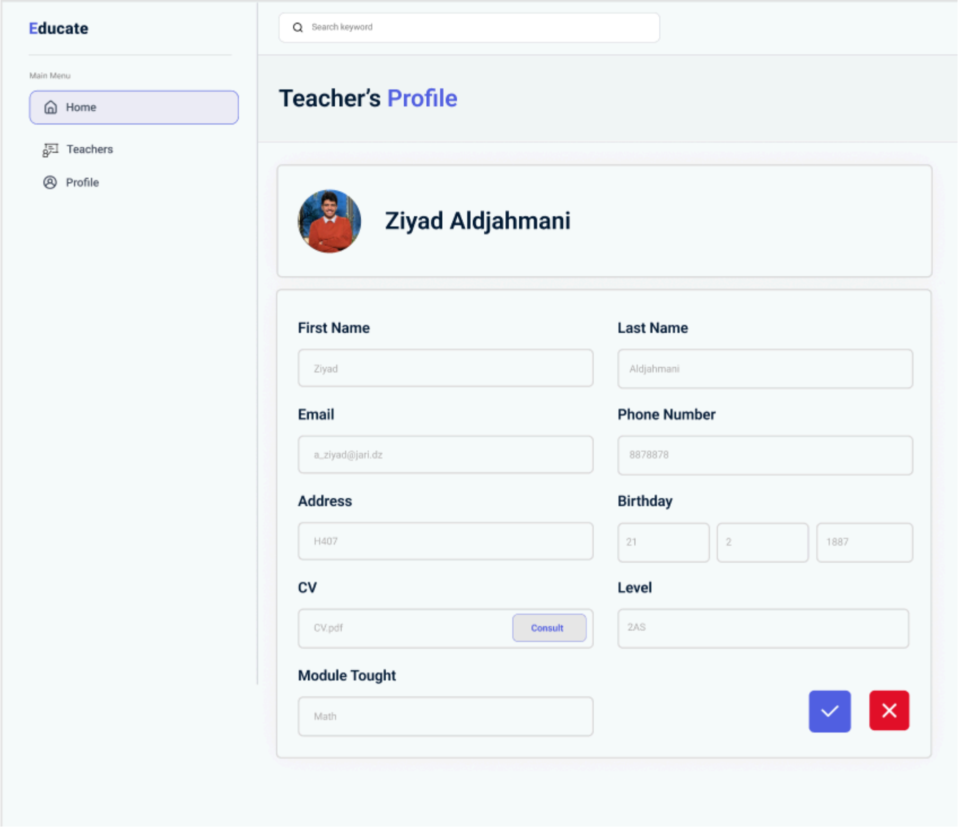
Ziyad Aldjahmani
a_ziyad@jari.dz

Ziyad Aldjahmani
a_ziyad@jari.dz

Ziyad Aldjahmani
a_ziyad@jari.dz

Ziyad Aldjahmani
a_ziyad@jari.dz

Figure 9.24 – Admin Home Page: Displaying all requests of teachers who wants to work with us, with the ability to accept or refuse the request



Teacher's Profile

Ziyad Aldjahmani

First Name: Ziyad

Last Name: Aldjahmani

Email: a_ziyad@jari.dz

Phone Number: 8878878

Address: H407

Birthday: 21 2 1887

CV: CV.pdf

Level: 2AS

Module Tought: Math

Figure 9.25 – Admin Home Page2: Admin viewing personal information and qualifications of teachers that made requests

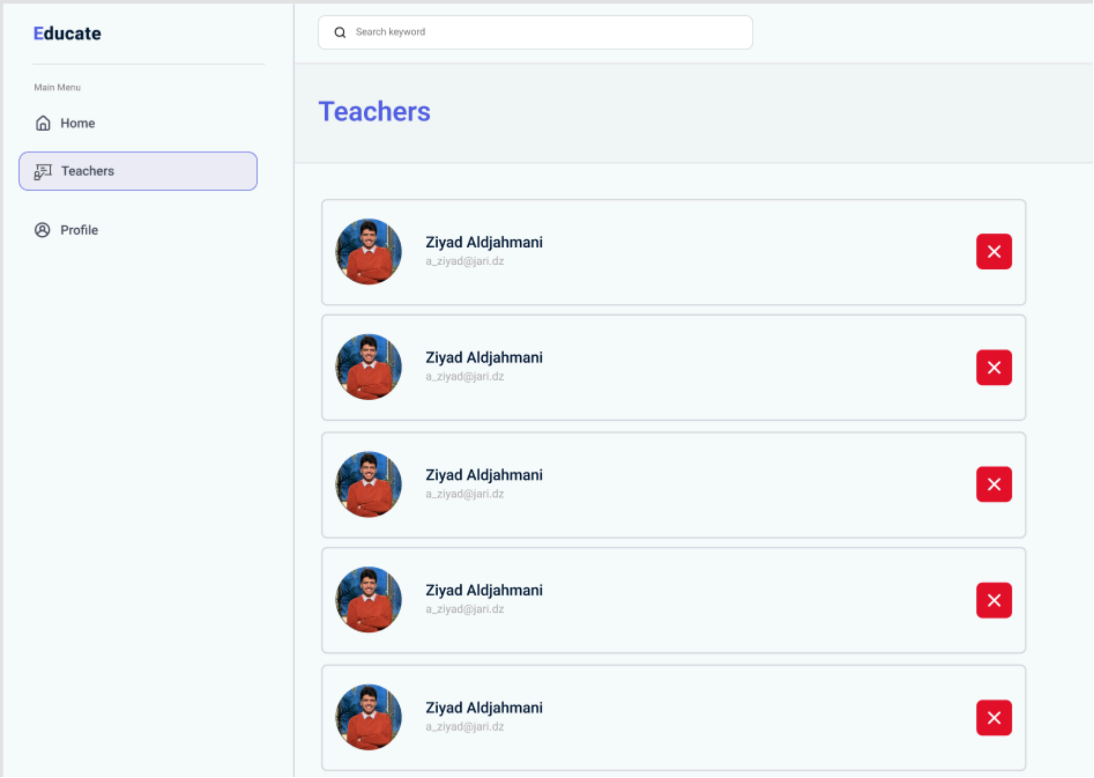
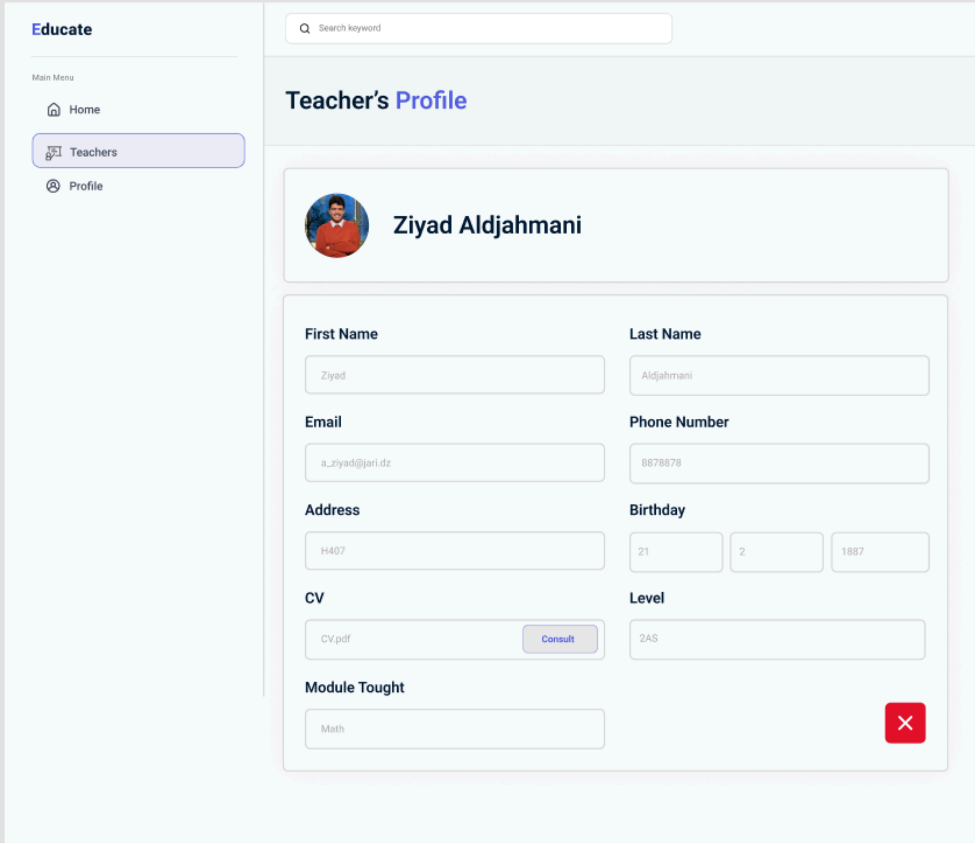


Figure 9.26 – Admin's Teachers Page: Displaying all teachers that work with us, with the ability to remove



Teacher's Profile

Ziyad Aldjahmani

First Name: Ziyad

Last Name: Aldjahmani

Email: a_ziyad@jari.dz

Phone Number: 8878878

Address: H407

Birthday: 21 2 1887

CV: CV.pdf

Level: 2AS

Module Tought: Math

Figure 9.27 – Admin's Teachers Page2:: Admin viewing personal information and qualifications of teachers working with us