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THEME
Start-up project
Elearning platform with a chat video

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Dedication

We dedicate this work to

our parents, whose selfless sacrifices and unconditional love have shaped us into who we are today, we owe you an immeasurable debt of gratitude. Your unwavering support and belief in our abilities have been the driving force behind our success.

To our siblings, who have stood by our side through thick and thin, offering their unwavering love and unwavering support, we are forever grateful. Your presence has brought immense joy and strength to our lives.

To our extended family, for always being our rock and providing a strong sense of belonging, we thank you. Your encouragement and guidance have been instrumental in our personal and academic endeavors.

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To our friends, both near and far, who have offered their unwavering friendship, understanding, and encouragement, we express our heartfelt appreciation. Your presence has brought laughter, solace, and companionship during both the challenging and joyful moments.

Lastly, to all those who have contributed in any way to make this project possible, whether through collaboration, support, or inspiration, we extend our sincere gratitude. Your contributions, big or small, have played a significant role in the realization of this endeavor.

This work is dedicated to all the unsung heroes in our lives, whose impact may often go unnoticed, but whose presence and support have been invaluable. May this dedication serve as a token of our gratitude and a reminder of the profound influence you have had on our lives.

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We would also like to thank our beloved family for their unwavering support, understanding and love. Your belief in our abilities and sacrifices has been our driving force. Your encouragement has given us strength during difficult times, and we are forever grateful.

I hope this acknowledgment serves as a small token of our gratitude, and a testament to the invaluable impact on our journey. Thank you for being a part of this endeavor and for making it a truly wonderful experience.

Abstract

This startup project focuses on creating an easy-to-use and effective Learning Management System that improves the learning experience for students and teachers. Existing LMS platforms often suffer from usability issues, making it difficult for users to navigate and access necessary features. To address these challenges, this study aims to design a convenient and intuitive LMS.

Résumé

Notre projet dans le cadre d'une Startup se concentre sur la création d'un système de gestion de l'apprentissage facile à utiliser et efficace qui améliore l'expérience d'apprentissage des étudiants et des enseignants. Les plates-formes LMS existantes souffrent souvent de problèmes d'utilisabilité, ce qui rend difficile pour les utilisateurs de naviguer et d'accéder aux fonctionnalités nécessaires. Pour relever ces défis, cette étude vise à concevoir un LMS pratique et intuitif.

ملخص:

يعد مشروعنا جزءًا من شركة ناشئة تركز على إنشاء نظام إدارة تعلم سهل الاستخدام وفعال يعمل على تحسين تجربة التعلم للطلاب والمعلمين، غالبًا ما تعاني الأنظمة الحالية من مشكلات في قابلية الاستخدام ، مما يجعل من الصعب على المستخدمين التنقل والوصول إلى الميزات المطلوبة، لمواجهة هذه التحديات حيث تهدف هذه الدراسة إلى تصميم عملي وبديهي.

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Abreviations list

DEP   Dependency

FR   Functional requirements

LMS   Learning Management System

MOOC   a massive open online course

RAT   Rational

ID   identification

SRS   software requirement specification

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Chapter 01

General Introduction

1 General Introduction

1.1 Context :

We are working on an platform elearning with a chat video project with the video feature with in the framework of a startup project, where in our project we have created a platform elearning with the video feature that enables the student to improve his educational level and facilitate communication with the teacher at any time and anywhere.

1.2 Objectives:

The purpose of this document for an e-learning system is a document that outlines the requirements and specifications for a system that facilitates online education. This particular e-learning system will feature a video chat function that allows for real-time interaction between teachers and students, as well as interactive elements that enhance the learning experience. The system will be designed to be user-friendly and accessible to all students, regardless of their technical skill level. The system will also have a robust set of features that allow teachers to create and manage course content, track student progress, and provide feedback to students. Overall, the goal of this e-learning system is to provide a high-quality, interactive, and engaging learning experience for students.

1.3 Report Outline:

The first chapter of the project dealt with the subject of the learning management system, explaining its importance, objectives, and how to use it. In the second chapter, we dealt with the book of conditions, explaining in it all the information that pertains to our project. In the third chapter, we dealt with. Specific requirements Where we provided a detailed explanation of the role of each user and the tasks he performs.

In the fourth chapter, we gave an explanation about the project and how to operate it with a class diagram and a sequence diagram. In the fifth chapter, we provided all clarifications about the platform and the application and how to use it, and we commented on all the available features.

Chapter 02

Learning Management System

Chapter 02 : Learning Management System

Introduction :

In today's digital age, the field of education has witnessed a significant transformation. Learning Management Systems (LMS) have emerged as powerful tools that facilitate and enhance the learning experience in various educational settings. An LMS is a software application or platform designed to manage, deliver, and track learning activities and resources for students, teachers, and administrators.

At its core, an LMS serves as a centralized hub where educational content, such as courses, modules, quizzes, and assignments, can be created, organized, and delivered to learners. It provides a seamless online environment where students can access learning materials, interact with instructors and peers, submit assignments, and track their progress.

One of the key advantages of an LMS is its ability to deliver personalized learning experiences. With features like adaptive learning, intelligent recommendations, and customized assessments, an LMS can cater to individual learner needs, preferences, and skill levels. This adaptability helps optimize the learning process, allowing students to acquire knowledge at their own pace and in their preferred style.

Moreover, LMS platforms are often equipped with assessment and grading functionalities. Educators can create and administer quizzes, exams, and assignments, which can be automatically graded, providing timely feedback to learners. This streamlines the evaluation process and helps instructors gauge the effectiveness of their teaching strategies.[1]

2.2 Definition of Learning Management System:

A Learning Management System (LMS) refers to a software application or platform that is designed to facilitate the management, delivery, and tracking of educational content and activities. It serves as a centralized system where instructors can create and organize courses, modules, assessments, and other learning materials, while providing students with access to these resources and enabling them to engage in online learning.[2]

An LMS typically offers features such as content creation and management, student enrollment and tracking, communication tools, assessment and grading capabilities, and reporting functionalities. It acts as a virtual learning environment, allowing learners to access educational materials, interact with instructors and peers, submit assignments, take quizzes and exams, and monitor their progress.

The primary goal of an LMS is to enhance the learning experience by providing a flexible and interactive platform for both educators and learners. It enables instructors to design and deliver engaging and personalized learning experiences, tailored to meet the individual needs and learning objectives of students. Additionally, an LMS simplifies administrative tasks, streamlines the evaluation process, and provides valuable insights into learner performance and engagement through data analytics.

2.3 Objective of Learning Management Systems :

2.3.1 Centralized Learning Hub:

An LMS serves as a centralized platform where educational content, resources, and activities are organized, managed, and delivered to learners. It acts as a virtual hub for learners, instructors, and administrators, providing a unified location for accessing and engaging with learning materials. [4]

2.3.2 Efficient Course Management:

The primary purpose of an LMS is to streamline the management of courses and learning programs. It enables instructors to create and organize course materials, syllabi, assignments, assessments, and other resources in a structured manner. This facilitates efficient course administration and ensures that learners have access to all the necessary information and materials. [4]

2.3.3 Enhanced Learning Experience:

An LMS aims to enhance the learning experience by offering a range of interactive and engaging features. It provides multimedia content, discussion forums, collaborative tools, and interactive assessments that promote active learning and knowledge retention. By providing a dynamic and interactive learning environment, an LMS helps learners engage with the course content more effectively.[6]

2.3.4 Personalized Learning:

An LMS supports personalized learning by allowing instructors to tailor content and assessments to individual learner needs. It offers features like adaptive learning pathways, personalized recommendations, and individual progress tracking. This personalized approach helps learners focus on their specific learning goals and progress at their own pace.[7]

2.3.5 Communication And Collaboration:

An important purpose of an LMS is to facilitate communication and collaboration among learners, instructors, and peers. It provides communication tools such as discussion forums, messaging systems, and virtual classrooms, enabling learners to interact, share ideas, and seek clarifications. This fosters a sense of community and encourages collaborative learning.[8]

2.3.6 Assessment And Performance:

An LMS enables instructors to create and administer assessments, quizzes, and assignments, and automatically grade them. It provides a centralized location for tracking learner progress, performance, and achievements. This allows instructors to monitor individual and overall class performance, identify areas for improvement, and provide timely feedback to learners.

2.3.7 Administrative Efficiency:

Another purpose of an LMS is to streamline administrative tasks related to managing courses and learners. It simplifies processes such as enrollment, scheduling, reporting, and data management. By automating administrative tasks, an LMS saves time and resources for instructors and administrators, enabling them to focus on delivering quality education.

2.4 work of Learning Management Systems :

Learning Management Systems (LMS) work through a combination of software, databases, and user interfaces to facilitate the management, delivery, and tracking of learning activities. Here is a general overview of how LMS typically work:

Course Creation and Content Management: Instructors or course developers use the LMS interface to create and organize courses. They can upload or create various types of educational content such as text documents, multimedia files, presentations, quizzes, and assignments. These resources are organized into modules or units within the LMS.

User Enrollment and Authentication: students are enrolled in the LMS by administrators or instructors. Each user is assigned a unique login ID and password to access the system. Authentication mechanisms ensure that only authorized users can access the LMS and its associated courses.

Access to Learning Materials: Once logged in, learners can access the courses and learning materials provided within the LMS. They can view course content, download resources, participate in discussions, and interact with multimedia elements.

Communication and Collaboration: LMS platforms typically include communication tools to facilitate interaction between learners and instructors. These tools can include discussion forums, messaging systems, video conferencing, or virtual classrooms. Learners can ask questions, engage in discussions, seek clarification, and collaborate with peers on group projects.

Tracking and Assessment: LMS platforms offer features to track learner progress and performance. Instructors can create assessments such as quizzes, tests, and assignments within the LMS. Learners can submit their work electronically, and the system can automatically grade certain types of assessments. Instructors can review and provide feedback on the submitted work.

Reporting and Analytics: LMS platforms generate reports and analytics based on learner data. This data includes information on learner engagement, completion rates, assessment scores, and other relevant metrics. These reports help instructors and administrators monitor learner progress, identify areas of improvement, and evaluate the effectiveness of instructional strategies.

Administrative Functions: LMS platforms also include administrative features to manage user accounts, enrollments, and course settings. Administrators can handle tasks such as adding or removing users, setting course access permissions, and generating reports on learner activity.

Integration and Compatibility: LMS systems may integrate with other educational tools, content management systems, or student information systems. This integration allows for seamless data exchange and enables a more comprehensive educational ecosystem.[9]

2.5 Types Of Learning Management Systems Deployments:

Learning Management Systems (LMS) can be deployed in various ways to suit the specific needs and requirements of educational institutions and organizations. Here are the main types of LMS deployments:

On-Premises Deployment: In an on-premises deployment, the LMS software is installed and hosted locally on the institution's or organization's own servers or infrastructure. The institution has full control over the system, including maintenance, security, and data management. On-premises deployments offer maximum customization and control but require dedicated IT resources for management and maintenance.

Cloud-Based Deployment: Cloud-based LMS deployments involve hosting the LMS software on a remote server or cloud infrastructure. The institution accesses the LMS through a web browser without having to manage the underlying hardware or software. Cloud-based deployments offer scalability, accessibility, and reduced IT infrastructure costs. The LMS provider is responsible for system maintenance, updates, and data security.

Hybrid Deployment: Hybrid deployments combine elements of both on-premises and cloud-based deployments. Institutions may choose to host some parts of the LMS on their own servers while utilizing cloud-based services for other components. This allows for flexibility and customization while leveraging the scalability and accessibility of the cloud.

Open-Source Deployment: Open-source LMS deployments involve using LMS software that is freely available and can be customized and modified according to specific needs. Institutions have complete control over the system and can modify the source code to add or modify features. Open-source deployments provide flexibility and cost savings but require technical expertise for customization and ongoing maintenance.

Software-as-a-Service (SaaS) Deployment: In a SaaS deployment, the LMS is delivered as a service over the internet. Institutions subscribe to the LMS service provided by a vendor, and the LMS is hosted and maintained by the vendor. SaaS deployments offer ease of setup, automatic updates, and reduced IT infrastructure costs. Institutions pay a subscription fee based on usage or the number of users.

Mobile App Deployment: Some LMS platforms offer dedicated mobile applications that can be installed on learners' mobile devices. These mobile apps provide access to learning materials, course content, communication tools, and assessments, allowing learners to engage in learning activities on the go. Mobile app deployments enhance accessibility and convenience for learners. [10]

2.6 Benefits Of Learning Management Systems:

Implementing a Learning Management System (LMS) offers numerous benefits to educational institutions, organizations, instructors, and learners. Here are some key advantages of using an LMS:

Centralized Learning Environment: An LMS provides a centralized platform where all learning materials, resources, and activities can be organized and accessed. This ensures that learners have a consistent and structured learning experience, with easy access to course content, assignments, quizzes, and other relevant materials.

Flexibility and Accessibility: LMS platforms enable anytime, anywhere learning. Learners can access the LMS and engage with the learning materials from their computers, laptops, or mobile devices. This flexibility allows learners to study at their own pace, fitting their education around their schedules and preferences.

Personalized Learning Experience: An LMS allows instructors to customize learning paths and content based on individual learner needs. Adaptive learning features, intelligent recommendations, and personalized assessments can be implemented to address different learning styles, skill levels, and preferences. This promotes more effective and engaging learning experiences.

Enhanced Communication and Collaboration: LMS platforms provide communication tools such as discussion forums, messaging systems, and virtual classrooms, fostering interaction and collaboration among learners, instructors, and peers. These features facilitate knowledge sharing, group work, and active participation, creating a vibrant online learning community.

Efficient Course Management: LMS platforms streamline administrative tasks related to course management. Instructors can easily create and update course content, track learner progress, automate grading, and generate reports. This automation saves time and effort for instructors and administrators, allowing them to focus on instructional design and teaching.

Scalability and Cost-Effectiveness: LMS platforms offer scalability, allowing educational institutions to deliver courses to large numbers of learners. Whether it's a small class or a massive open online course (MOOC), LMS platforms can handle the scalability requirements. Additionally, by eliminating the need for physical infrastructure, printed materials, and travel expenses, LMS deployments can be cost-effective in the long run.[7]

2.7 Examples Of Learning Management System:

There are two types of platform for LMS: open sourceand commercial. There are many open source platforms,such as Moodle, Sakai, MyLMS. Meanwhile, examples of commercial LMS areBlackboard, SuccessFactors, SumTotal, Litmos, Anglelearning, Geo learning, Cornerstone and Connect Edu.

Forthe purposes of this paper, however, we will focus onthree LMS from each category, i.e. open source and commercial.

2.7.1 Moodle:

The first open source platform to be considered isMoodle. Moodle is an abbreviation of Modular ObjectOriented Dynamic Learning Environment. It is an LMSthat was developed in 2001 and is based on the socialconstructionist pedagogical principle. It is developed under the terms of a GNU General Public License(GPL),which means that any changes can be made to the sourcecode as long as the original license is not changedThe characteristics the Moodle platform are user-friendliness, accessibility, and flexibility. There isalso a list of students on each course allowing the lecturerto know the last time each student accessed the platform,the ability to integrate Moodle into other systems, theability to allow synchronous and asynchronous interaction, a personal area for draft writing and journaling aswell as managing personal and private information, andcontent that develops based on the teaching and learningneeds and that can be reused..[8]

Regardez //model.lim/?lang=fer

2.7.2 Atutor:

The ATutor platform is an LMS that is based on opensource web technology used to develop and present onlinecourses The leader can copy, distribute and edit theATutor under the public licensing conditions of a GNUGeneral Public License (GPL). The key characteristic ofatutor is its accessibility, as it ensures that users are ableto participate in activities as students, instructors and administrators. In addition, the use of IMS/ISO for supportallows students to adapt the environment and the contentto the needs of their courses. Instructors and students are able to manage their ATutor courses, and users can sendand receive personal messages from other users. Each userhas their own file storing utility, and this storage can beshared with other users. Thus, all the content and thecourse structure can be stored and backed up in ATutor.

http://evolution.attraction.eh/

2.7.3 EDX

EdX Learning Platform User Edx platform ChatGPT EdX is an online learning platform that offers a wide range of courses and programs from top universities and institutions around the world. It was founded in 2012 by Harvard University and the Massachusetts Institute of Technology (MIT). [13] with the goal of providing high-quality education to anyone with internet access. Here are some key features and aspects of the edX platform:

1- Course Offerings
2- Course Formats
3- Open and Free Access
4- Interactive Learning Experience
5- Collaboration and Community
6- Continuing Education and Professional Development

http://that.digitalexperience.com

2.8 Conclusion:

In summary, an LMS streamlines education processes, enhances learning outcomes, and improves the overall educational experience. With its ability to centralize learning materials, personalize learning paths, facilitate communication and collaboration, and provide data-driven insights, an LMS empowers educational institutions and learners to unlock their full potential in the digital age.

Chapter 03

System's Description

Chapter 03: System'sDescription

3.1 Introduction :

Our project is a desktop application and website technology. It's used for e-learning practices and, in its most common form, consists of two elements: a server that performs the base functionality and a user interface (UI) that is operated by instructors, students and administrators.

This particular e-learning system will feature a video chat function that allows for real-time interaction between teachers and students, as well as interactive elements that enhance the learning experience.

The system will also have a robust set of features that allow teachers to create and manage course content, track student progress, and provide feedback to students.

The goal of this e-learning system is to provide a high-quality, interactive, and engaging learning experience for students.

3.2 Definition of our project:

An electronic learning platform with a chat video is an integrated set of interactive online services that provide trainers, learners, and others involved in education with information, tools, and resources to support and enhance education delivery and management.

3.3 Objective of our project :

The purpose of this document for an e-learning system is a document that outlines the requirements and specifications for a system that facilitates online education. This particular e-learning system will feature a video chat function that allows for real-time interaction between teachers and students, as well as interactive elements that enhance the learning experience. The system will be designed to be user-friendly and accessible to all students, regardless of their technical skill level. The system will also have a robust set of features that allow teachers to create and manage course content, track student progress, and provide feedback to students.

Learning system is to provide a virtual classroom environment that allows for real-time communication and interaction between teachers and students. The system aims to replicate the traditional classroom setting as closely as possible, while also providing additional tools and resources that enhance the learning experience.

3.4 Field Of Work:

The e-learning system will feature video conferencing and chat functionality, which will enable real-time virtual classes and interactive discussions between teachers and students. This will allow for a classroom-like experience, where students can ask questions and engage in discussions with their peers and teachers in real-time.

In addition to this, the system will include tools for teachers to conduct assessments and provide feedback to students. This will help teachers to evaluate students' understanding of the material, and provide them with constructive feedback in real-time.

The system will also have recording and saving functionality for classes, allowing students to view missed classes or review material at a later time. This will be particularly useful for students who have missed a class due to unforeseen circumstances.

Functionality for resources and materials, such as class notes, assignments and quizzes, will also be included in the system. This will allow teachers to easily distribute class materials and resources to students, and allow students to access and review them at any time.

A user management and authentication system will be in place to ensure secure access to the system. This will ensure that only authorized users can access the system and the sensitive information contained within it.

The system will allow students to communicate with their peers in real-time, which will help them to interact with them and collaborate in class discussions. This feature will be beneficial for students who are looking to build their social skills and network with their peers.

The system will provide teachers with the ability to schedule and conduct live classes, as well as schedule pre-recorded classes. This will provide them with the flexibility to adapt to different teaching styles and needs of the students.

Finally, the system will allow students to access the recorded classes and resources anytime, anywhere, allowing them to review the material at their own pace and convenience.

3.5 Overall Description:

This e-learning system is designed to provide students with a virtual classroom experience that is interactive and engaging. It is intended for use in educational institutions, such as schools, colleges and universities, and can also be used for professional training and development.

3.6 Product Perspective:

Our system is implemented in Client-Server Architecture. The system have a central server that handles all the processing and storage of the e-learning content and user information. The clients (i.e. the students' and teachers' devices) would connect to the server to access the system and its features.The system consists of three parts: the desktop application and data base ,and front end.**(see the figure 1).**

Figure 1:Software Architecture

3.6.1 Desktop Application For Teachers:

This application will be installed on the teacher's computer and will provide them with a user friendly interface to manage their classes, conduct live virtual classes with the built in video conferencing feature. The application will also have a built-in desktop recording feature, which would allow the teacher to automatically record their screen and audio during class. It would also allow them to communicate via messages with students and answer their questions.

He can also broadcast live from anywhere, anytime, in real time

3.6.2 Frontend:

frontend would be a web application that provides a user-friendly interface for students to access and view the recorded classes, and interact with the teachers, the students will also have the possibility to access the schedule of their classes, and their grades.

3.7 System Composition:

Our system is decomposition into several sub-systems which are:

User management: The system should allow for the creation, management, and deletion of user accounts for administrators, teachers, students, and parents.

Content management: Teachers should be able to create and upload content, including text, images, and videos.

Class management: Teachers should be able to create and manage classes, including scheduling and canceling classes, and managing class rosters.

recording: The system responsible of recording the teacher screen and audio during a class and automatically upload the recording to the backend.

Video playback: Students should be able to view recorded classes and interact with the teachers.

Communication: The system should include a messaging feature for students to communicate with teachers and other students.

Access control: The system should include security and access control mechanisms to ensure that only authorized users can access and view the content.

3.8 User Characteristics:

The system has three main contributing types of actors that are:

Administrators:

Administrators would have a high level of technical expertise and be responsible for managing and maintaining the system. They would need to be able to navigate and understand the system's features and functionality.

Teachers:

Teachers would have a moderate level of technical expertise and be responsible for creating and uploading content, conducting live virtual classes, and recording their classes. They would need to be able to use the desktop application and understand how to use the video conferencing and recording features.

Students:

Students would have a moderate level of technical expertise and be responsible for accessing and viewing recorded classes, interacting with teachers through the
video chat feature, and accessing their grades and class schedules

Automated workflow and content management -streamlining the process of creating، managing، and delivering eLearning content, to make it easier and more efficient for instructors.

3.9 Innovation In Our Project

We have created a collaborative e-learning platform that integrates video chat functionality to facilitate real-time interaction and collaboration between learners and educators. This innovation focuses on enhancing the interactive learning experience by enabling communication as we made an easy and intuitive project

Video chat be at any time and any time and in real time.

User Interface: The platform should have a user-friendly interface that allows users to easily navigate through the various features. The interface is visually appealing and responsive across different devices.

Course Creation And Management: The platform provides tools for instructors to create and manage courses. Teachers can upload video lessons, documents, and other educational materials. They can also organize course content into units or lessons.

Video Integration: The platform has a built-in video player that supports various video formats. Instructors can upload pre-recorded video lessons or conduct live streaming sessions for interactive learning.

Chat Functionality: The platform includes a chat feature that allows users to communicate with instructors and other learners. Users can ask questions, request clarification, and participate in discussions related to the course materials.

Mobile Compatibility: The platform is compatible with mobile devices, allowing users to access courses and participate in chat/video sessions using smartphones or tablets. This allows learners to have flexibility in their learning and to access the content anytime and anywhere.

Live video : Real-time teaching and learning sessions conducted through e-learning platforms. Instructors deliver lessons, interact with students, provide feedback, and facilitate discussions using video, audio, and chat features

Record video: After the teacher finishes the live broadcast, he records the broadcast in the form of a video and then downloads it on the platform, allowing the students to return to it and benefit from it.

3.10 Conclusion:

In conclusion, our e-learning platform with chat video provides a unique and engaging learning experience for students. By combining text-based chat with video, we offer a dynamic and interactive way for students to learn and engage with course material. With features like live video conferencing, real-time collaboration, and instant feedback, students can ask questions, receive answers, and work together with their classmates and teachers in a virtual classroom setting. Whether students are in the same room or on different continents, this innovative platform is designed to bring learning to life and make education more accessible and effective for everyone.

Chapter 04

Requirements and Specifications

Chapter 04: Requirements and Specifications

4.1 Introduction

An e-learning platform with chat and video capabilities is a powerful tool that enables remote learning and collaboration. It provides an interactive and engaging learning experience by integrating chat-based communication and video conferencing features.

To develop such a platform, it is essential to define comprehensive specification requirements. These requirements outline the functionality, performance, security, and usability aspects of the platform, ensuring it meets the needs of both learners and educators. Let's explore some key specification requirements for an e-learning platform with chat and video capabilities.

4.2 Functional Requirements:

This section includes the requirements that specify all the fundamental actions of the software system.

4.2.1 User Class 1 - The User:

4.2.1.1 Functional Requirement :

ID: FR1

TITLE: Entre platform eLearning with chat video

DESC: A user should be able to enter the web site.

RAT: In order for a user to enter theweb siteof platform eLearning withchat video.

DEP: None.

4.2.1.2 Functional Requirement:

ID: FR2

TITLE: User registration

DESC: the user should be able to :

Register through web site. The user must provide user-name, password and

e-mail address.

RAT: In order for a user to register.

DEP: FR1

4.2.1.3 Functional Requirement :

ID: FR3

TITLE: User Authentication

DESC: Given that a user has registered, then the user should be able to log in .

The log-in information will be stored on database and in the future the user should be

logged in automatically.

RAT: In order for a user to register .

DEP: FR1, FR2

4.2.1.4 Functional Requirement :

ID: FR4

TITLE: Profile page

DESC: On the platform eLearning with chat video, a user should have a profile page. On

the profile page a user can edit his/her information, which includes the password, e-mail

address and passe word.

RAT: In order for a user to have a profile page on the application of platform eLearning

with chat video.

DEP: FR1, FR2,FR3

4.2.1.5 Functional Requirement

ID: FR5

TITLE: Create course

DESC: Teachers can create courses that are tailored to the specific needs and interests of learners.

RAT: The create courses should be displayed in a profile page of teacher.

DEP: FR4, FR3.

4.2.1.6 Functional Requirement

ID: FR6

TITLE: create section

DESC :The teacher creates the content of the big titles in the courses and puts them in place

RAT: Clicking on the "Add class" button .

DEP: FR5

4.2.1.7 Functional Requirement

ID: FR7

TITLE: live sessions

DESC live sessions with a teacher through a chat video feature in a descktop application can be very beneficial for learners. It allows for real-time interaction between the teacher and the students, which can help to keep learners engaged and motivated.

RAT: The live video should be displayed in a profile page of students.

DEP: FR5 FR4.

4.2.1.8 Functional Requirement :

ID: FR8

TITLE: record the live sessions.

DESC Recorded sessions can also be used as a reference material for learners. They can go back to the recording to review specific concepts, instructions, or examples resented by the teacher

RAT: The record live session should be displayed in a profile page of student.

DEP

4.2.1.9 Functional Requirement :

ID: FR9

TITLE: Upload video.

DESC can also be upload video from profile page of teacher

RAT: the video saved in the session should be displayed in a profile page of teacher.

DEP:FR6,FR7,FR8

4.2.1.10 Functional Requirement :

ID: FR10

TITLE: interact with coutent

DESC: the student can also be interactive with contents of teacher

RAT: the student can interact with the coutent provided byThe teacher.

DEP:/

4.2.1.11 Functional Requirement :

ID: FR11

TITLE: view achievement

DESC the student can also be viewed the contents of teacher

RAT: the student can see the content of the lessons and see their sequential arrangement

DEP : FR10

4.2.1.12 Functional Requirement :

ID: FR12

TITLE: ask questions

DESC the student can also be ask question about the contents of teacher

RAT: The student can ask questions to the teacher through live.

DEP:FR5 ,FR7 ,FR10

4.2.1.13 Functional Requirement :

ID: FR13

TITLE: students watch video

DESC the student can also be watched video of teacher

RAT:The student can watch the video that the teacher puts in his personal profile

DEP:

4.2.1.14 Functional Requirement :

ID: FR14

TITLE: students chat with teacher and student

DESC the student can also be chat with teacher and student

RAT: The student can write and sent message to her teacher and his students

DEPFR7

4.2.1.15 Functional Requirement :

 ID: FR15

 TITLE: Search course

 DESC: Given that a user is logged in to the platform eLearning, then the first page that
is shown should be the search page.

 The user should be able to search for aPlatform content.

 RAT: In order for a user to search for a eLearning content.

 DEP: FR4, FR10, FR11

 4.3.2 User Class 2 –Administrator

4.3.2.1 Functional Requirement

ID: FR1 publishe course

In order to administer the system

An administrator

Should be logged in to the platform eLearning.

Scenario: publishe course:

he administrator should be able to publishe Course object to the administrator's list of courses on the platform eLearning with chat video.

4.3.2.2 Functional Requirement

ID: FR2 Remove Course

In order to administer the system

An administrator

Should be logged in to the platform eLearning with chat video.

Scenario: Remove Course

      The administrator should be able to Remove Course object to the administrator's list of courses on the platform eLearning

      He should also be able to remove multimedia resources such as videos, images, and audio files.

4.3.2.3 Functional Requirement

ID: FR3: System Configuration:
In order to administer the system
An administrator
Should be logged in to the platform eLearning with chat video.

4.3.2.4 Functional Requirement

ID: FR4 add user

In order to administer the system

An administrator

Should be logged in to the platform eLearning.

Scenario: Add Users

Upon logging in, the administrators can add users to the platform and can cancel their subscription

4.4 Uses Case

Use Case Admin
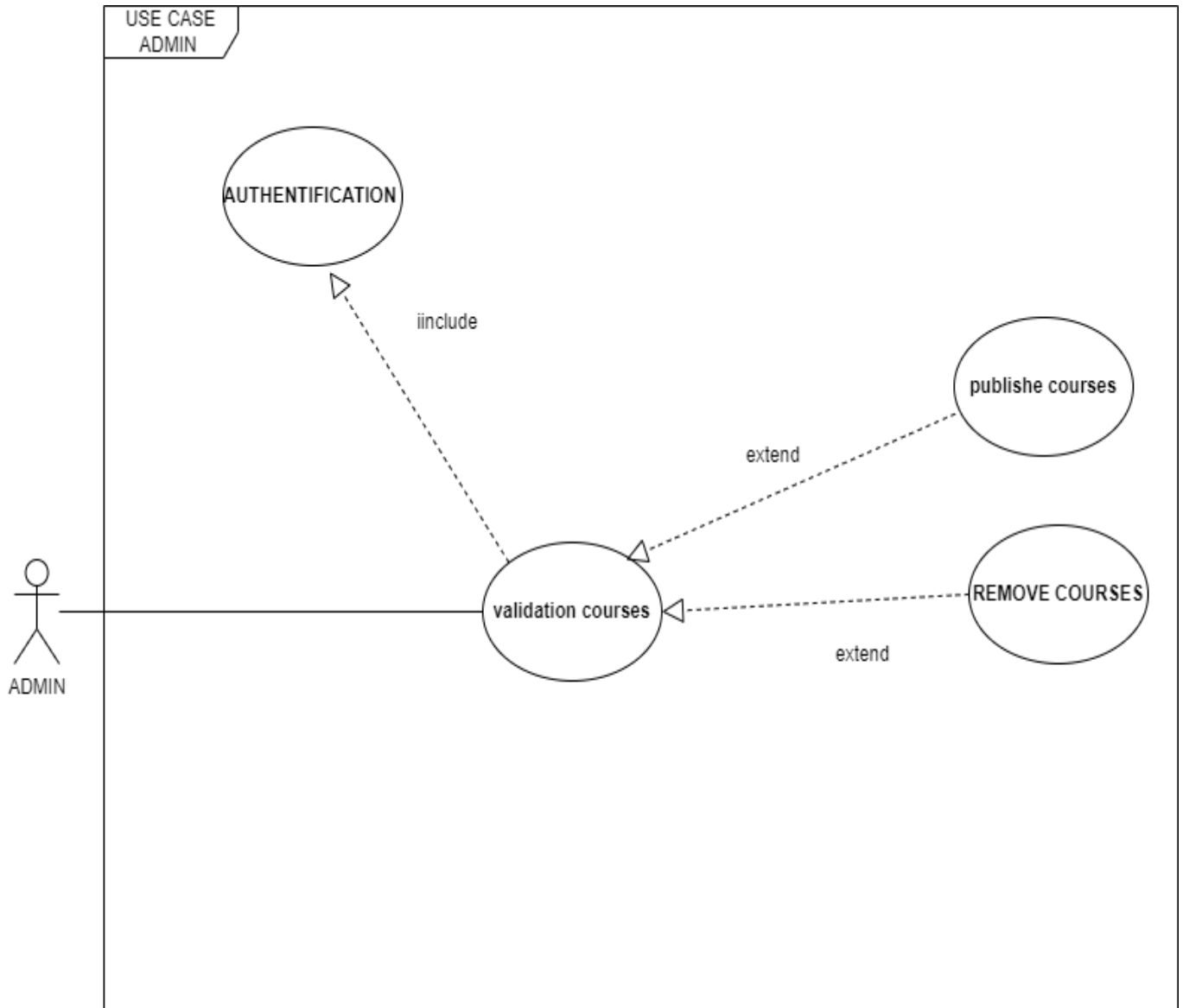
Figure 2 : admin use case

Table 1 description Admin

Description Admin	
Purpose: User updates.	
Actors:admin	
Pre-condition:administrator authenticate	
Description of the Scenario	
Nominal scenario	01: the Authenticate actor 02: add and remove cours
Alternative Scenario	If the account already exists the system displays an error message.

Use Case Teacher
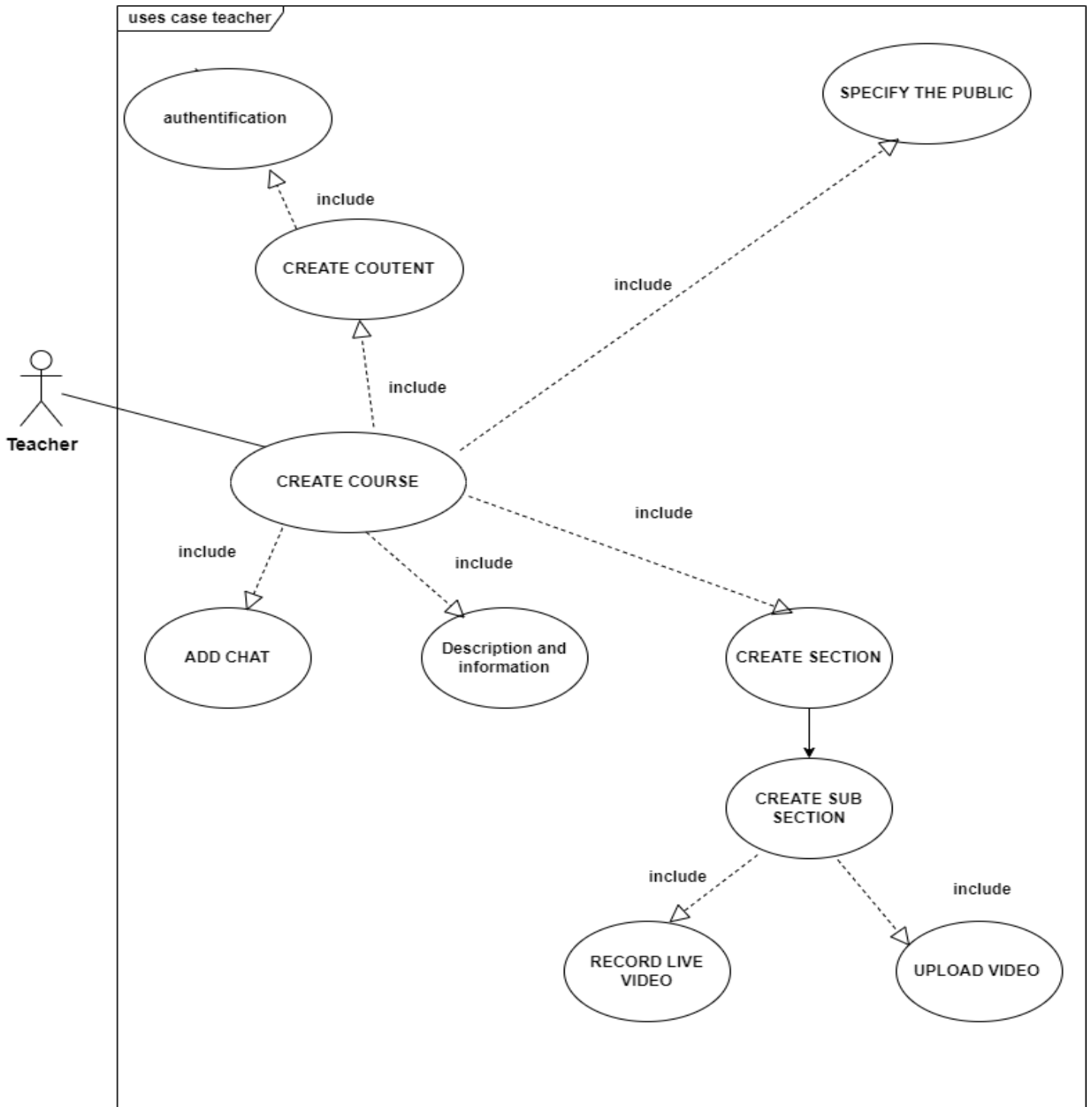
Figure 3: Teacher Use Case

Table 2 Description teacher

Description	
Purpose: Allow the teacher to add a lesson and live.	
Actors:teacher	
Pre-condition:The teacher must be logged in and add courses and the class of learners selected.	
Description of the Scenario	
Nominal scenario	01: the Authenticate actor 02: the teacher create coutent 03: add course 04: Description and information 05: create section and subsection of cours 06: recorde and upload video
Alternative Scenario	Follow the Nominal Scenario steps in this order the first time the course was added.

Uses Case Student
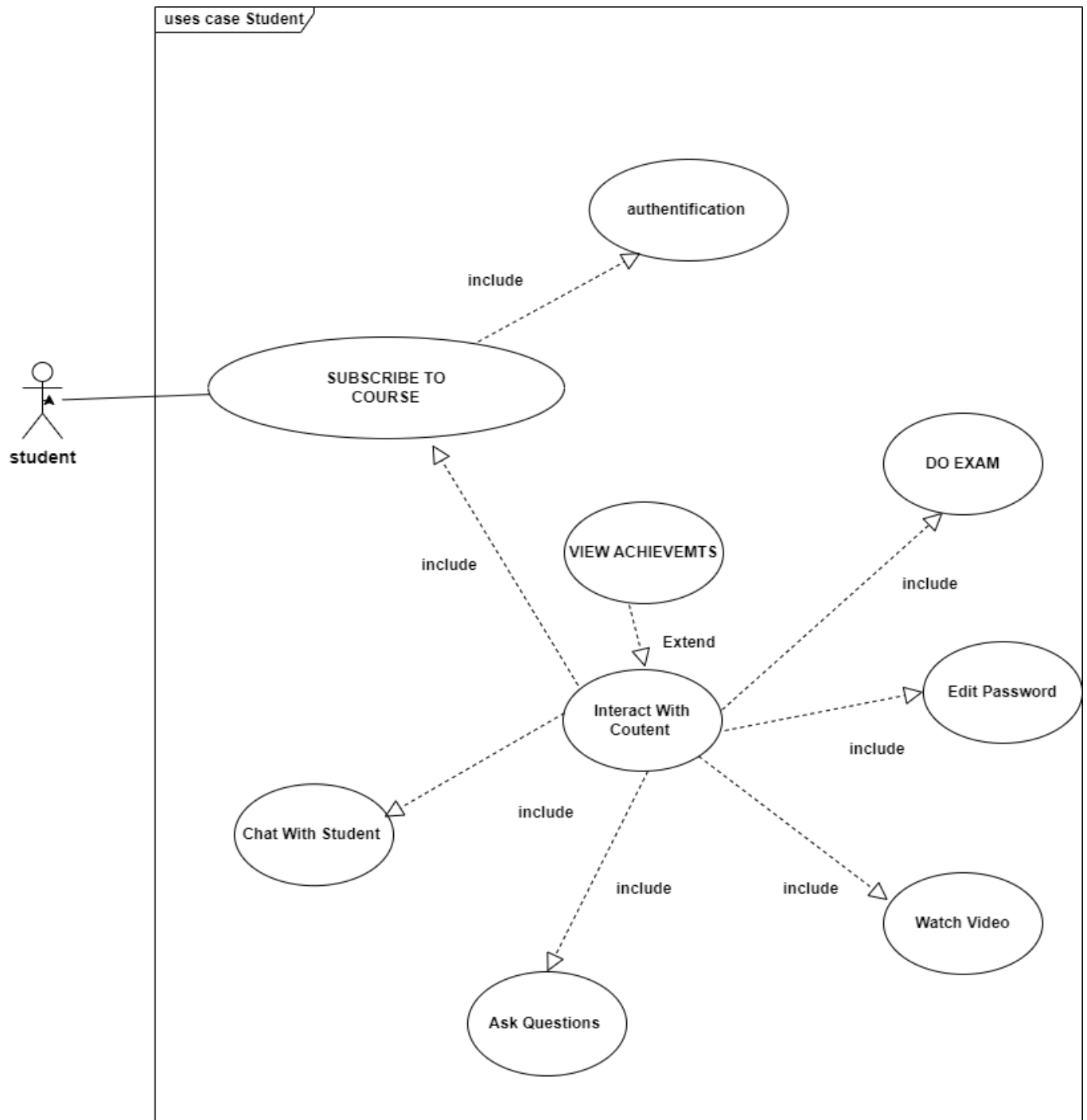
Figure 4: student use case

Table 3 description student

Description student	
Purpose: Allow the teacher to add a courses and live.	
Actors: student	
Pre-condition: The student must be logged in and Interact With Coutent.	
Description of the Scenario	
Nominal scenario	01: the Authenticate actors 02: Interact With Coutent 03: SUBSCRIBE TO COURSE 04: Watch Video .
Alternative Scenario	If the account already exists the system displays an error message

4.5 Conclusion :

The specification requirements cover various aspects, including user management, course creation and management, chat system, video conferencing, content management, assessments and progress tracking, mobile compatibility, security and privacy, analytics and reporting, and integration and customization. These requirements provide a comprehensive framework for building an e-learning platform that supports interactive communication, engaging content delivery, and effective learning assessment.

the specification requirements serve as a roadmap for developing an e-learning platform with chat and video capabilities that delivers an interactive, secure, and engaging learning experience. By meeting these requirements, the platform can empower learners, facilitate effective communication, and support educational institutions and organizations in the digital age.

Chapter 05: Modeling

Chapter 05: Modeling

5.1 Indroduction

In computer science and information technology, modeling is essential for designing and developing software systems. Software models can represent the structure, behavior, and interactions of complex software applications. These models aid in the analysis, design, and implementation phases of software development, enabling efficient code generation, error detection, and system optimization.

5.2 Class Diagram

Figure 5 : Class diagram

Part two of classe diagram
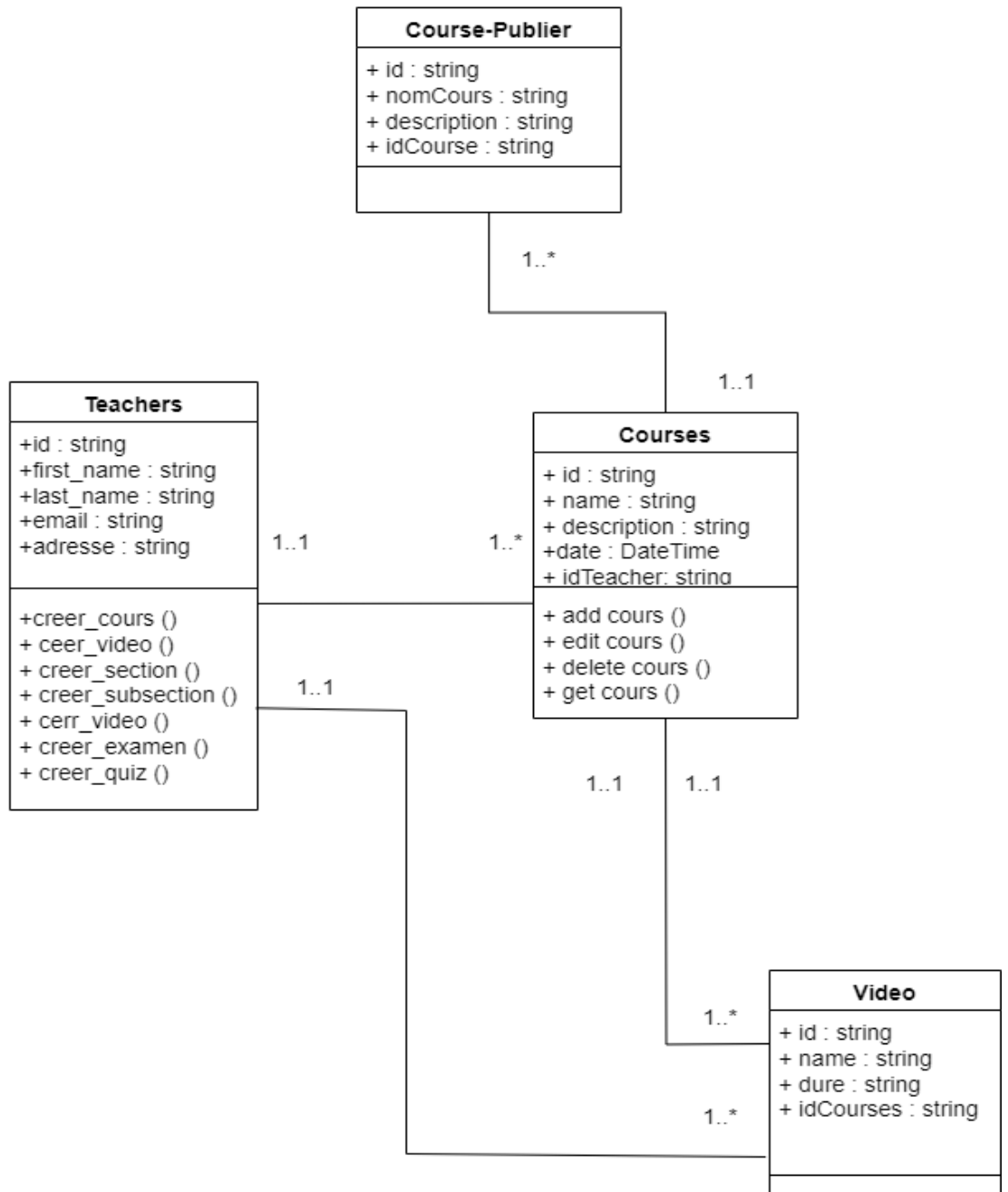
Figure 6 Class diagram

5.3 Sequence Diagram: Create Course
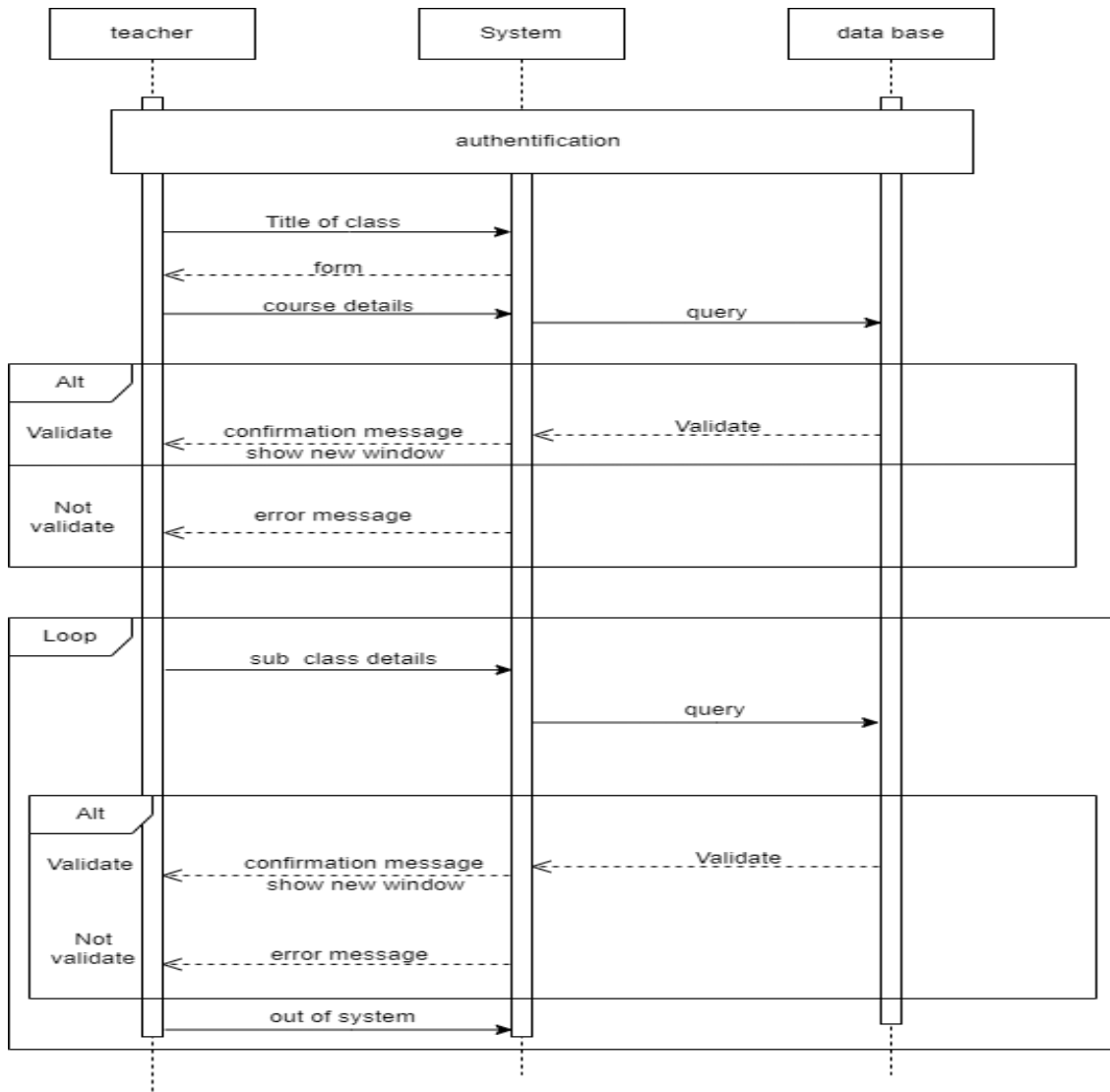
Figure 7: Sequence diagram Add Course

The teacher logs in to the platform, where the system allows him to add various courses, including a description of the course, content, and its duration. When he finishes placing all the courses, he is waiting for the administrators to accept the courses, as the courses are published on the platform.**(see the figure 7)**

5.4 Sequence Diagram: Live
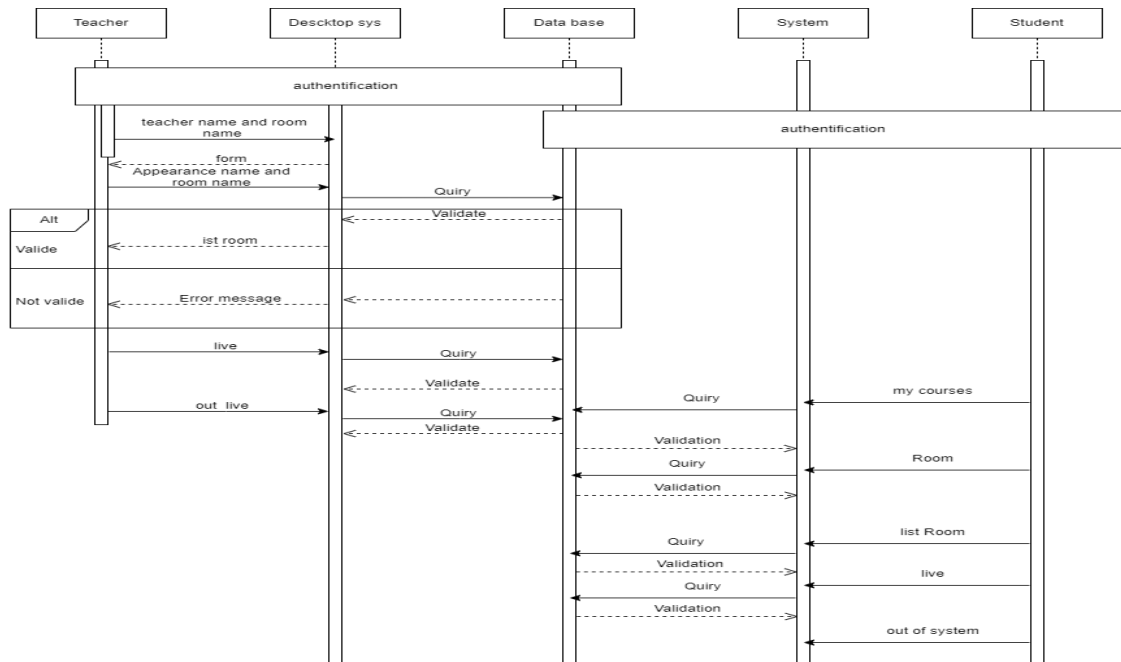
Figure 8: sequence diagram live

The teacher logs in to the application Descktop where he is allowed to enter all the information related to the creation of the chat room, where is the live broadcast that appears to the student on the platform and allows him to enter it automatically. **(see the figure 8)**

5.5 Sequence Diagram: Record And Upload Video

This figure shows the feature that records the video that the teacher does, as after logging in to the platform, the video is recorded and added to his personal account.**(see the figure 9)**
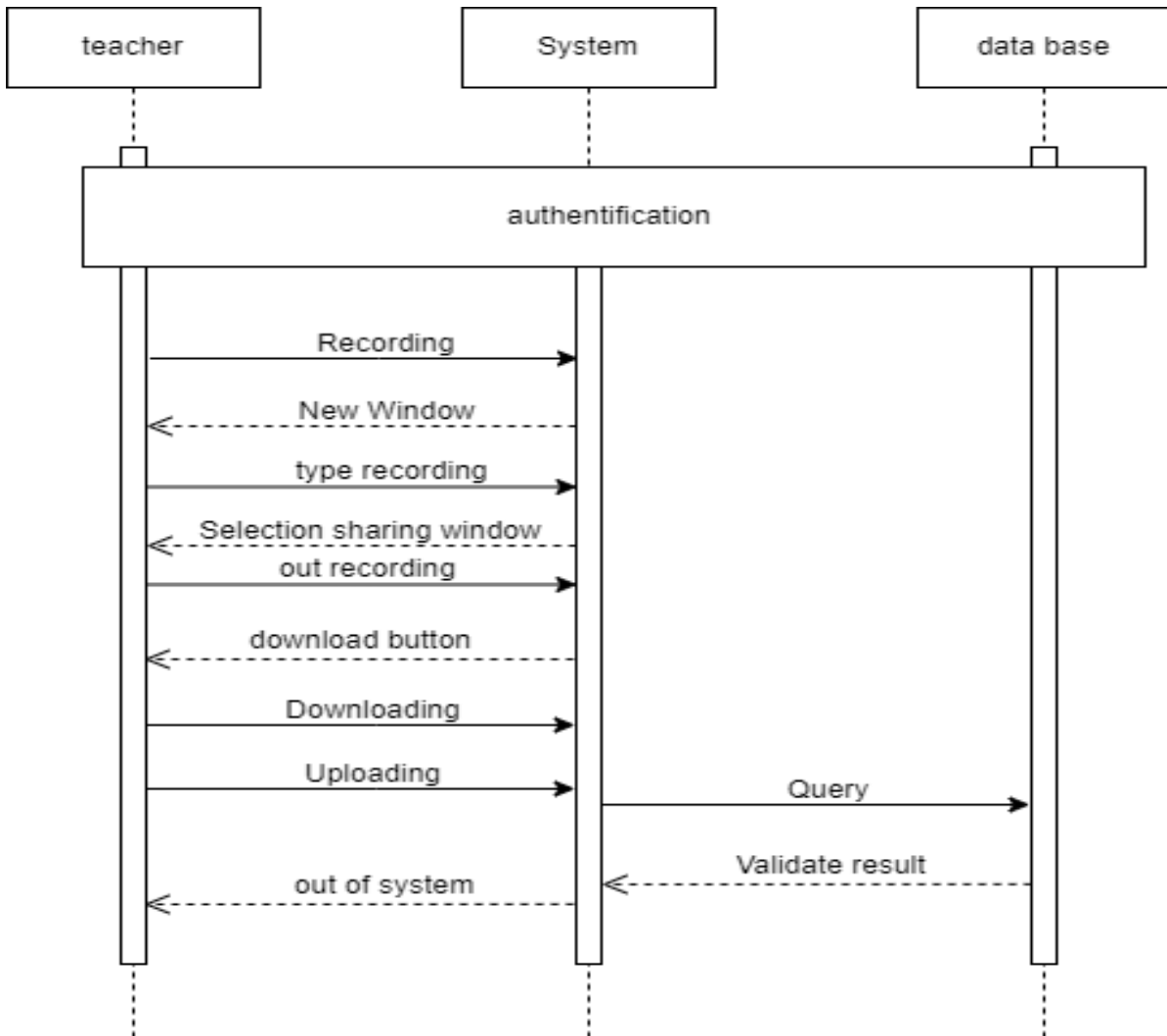
Figure 9 : Sequence diagram: Record and upload video

5.6 Sequence Diagram: Course Management
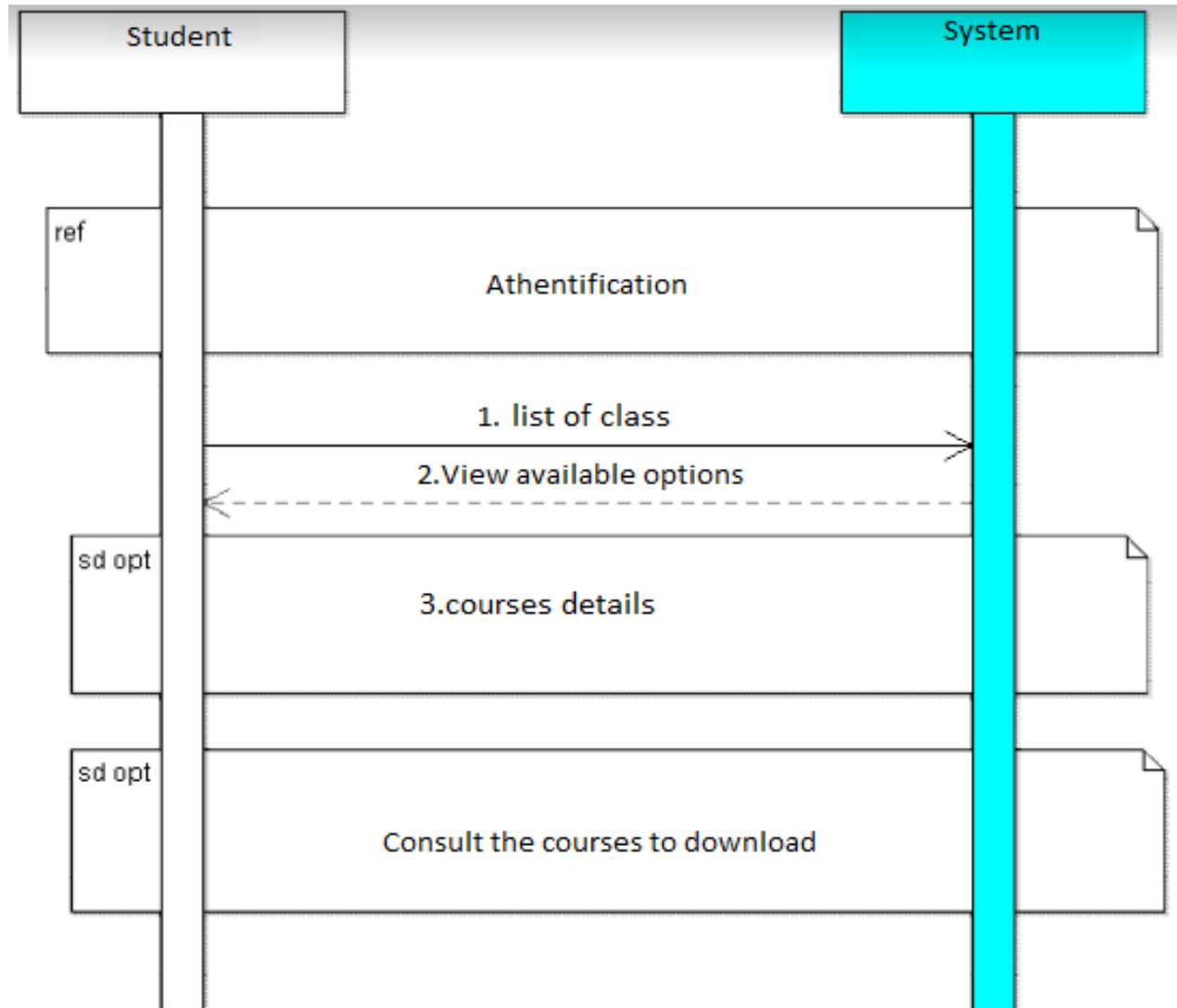
Figure 10: Sequence diagram: course management

This figure shows how to view courses, select lessons, and download them after logging in

(see the figure 10)

Conclusion

Modeling is a fundamental process that allows us to understand, predict, and influence complex lines across domains, It is also a powerful tool for engineers and analysts to test hypotheses and improve operational processes, enabling us to improve collaboration and build better systems across fields of study and industries.

Chapter 06

Implementation

Chapter 06: Implementation

6.1 Introduction:

After developing the design of our application, we will discuss in this chapter the last part of this thesis, which aims to expose the implementation phase.

The realization phase is considered to be the final realization of the entire design method.

We first conduct a technical study where we describe the software resources used in the development of our project. We first present our choice of the working environment, where we specify the hardware and software environment that we used to create our application and website, then we detail the architecture, also we present some interfaces created to illustrate operation of some system activities.

6.2 The Development Tools:

6.2.1 Presentation Of The Development Tools:

6.2.1.1 XAMPP:

XAMPP stands for Cross-Platform (X), Apache (A), MySQL (M), PHP (P) and Perl(P). It is a set of software allowing to setupEasily a Web server and an FTP server.It is a distribution of free software

Apache MySQL Perl PHP) easy to install offering a good flexibility of use allow the exploitation of an Apache server, the MySQL DBMS and the PHP interpreter. XAMPP is also cross-platform, meaning it works equally well on Linux, Mac, and Windows. [19]

6.2.1.2 Apache Server:

Is an HTTP server created and maintained within the Apache Foundation. usedmainly on Internet hosting inLinux, although it can also be used in Windows [20]

6.2.1.3 MySQL:

Is a database management system (DBMS). As an Open relational database server

Source, Based on StructuredQueryLanguage(SQL). Also MySQL is most commonly associated with web-based applications.[21]

6.2.1.4 PHP :

PHP (HyperText Preprocessor) is a programming languageProgramming that integrates into your HTML pages. Among other things, it makes it possible to make repetitive tasks automatic,

in particular thanks to the communication with a database (the most common use of PHP).[22]

6.2.1.5 CSS :

Literally Cascading Style Sheets, CSS is a simple declarative language for formatting HTML pages or XML documents. The XSS language makes it possible to specify the visual and sound presentation characteristics of a web page: the fonts, the margins and borders, the colors, the positioning of the various elements. [23]

6.2.1.6 HTML:

The HyperText Mark-upLanguage "HTML" is a so-called mark-up language (of structuring or markup) whose role is to formalize the writing of a document with formatting tags, the tags allowing to indicate the way in which must be presented the document and the links it establishes with other documents[24]

6.2.1.7 Laravel :

was created by Taylor Otwell in June 20112.

The Laravel/laravel repository on the GitHub site contains source code for early versions of Laravel. From the fifth version, the framework is developed within the Laravel/framework repository.

In a short time, a community of users of the framework was formed and in 2016 it became the highest rated PHP project on GitHub However, Laravel remains based on its big brother Symfony, for at least 30% of its lines (use of "Symfony component")[25]

6.2.1.8 A Visual Studio Code editor:

Is a helper software for creating and designing HTML pages. In our case we used a feature rich editor many professionals use this editor for most programming languages. This is the Visual .[26]

6.2.1.9 JavaScript (often abbreviated as "JS") :

is a lightweight, object-oriented scripting language, primarily known as the scripting language for web pages. But it is also used in many environments outside of web browsers such as Node. js, Apache CouchDB or even Adobe Acrobat.[27]

6.2.1.10 Agora SDK:

Agora is an SDK that allows you to easily implement video calls and live distribution on your own iOS/Android applications and websites. It provides a completely new user experience for video and audio and provides APIs and development tools that can be incorporated into your own iOS/Android applications and Web services. Agora is the world's largest real-time communication SDK.

is a software publisher for developers. JetBrains has offices in Prague, St. Petersburg, Boston, Moscow and Munich.[28]

6.2.1.11 PhpStorm :

is a development tool for PHP and Web projects. It's a perfect PHP IDE for working with Laravel, Symfony, Drupal, WordPress, and other frameworks.[29]

6.3 MVC Architecture :

MVC is one of the most widely used software architectures for web applications. Sheallows you to create a web application to properly manage the structuring of a project in three parts.[30]

This development model distinguishes 3 functionalities:
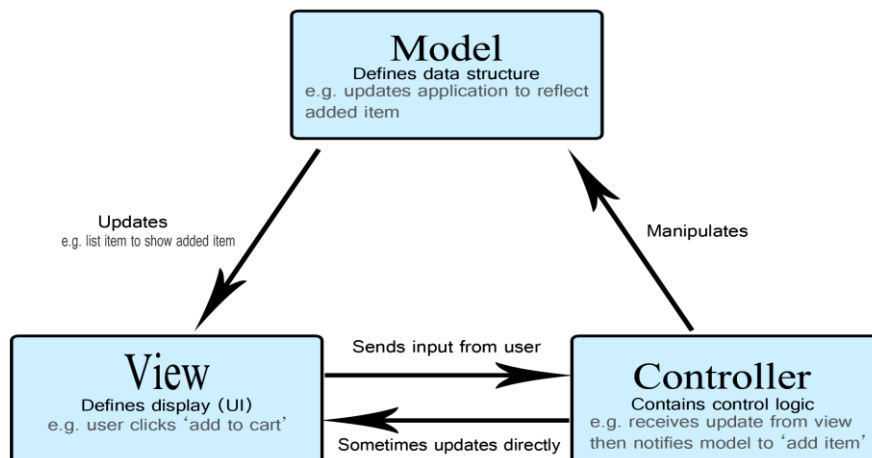
Figure 11: Model view controller

6.3.1 The View (V)

It represents what is exposed to the user, usually it is static HTML or

generated by PHP; There are two kinds of view:

+ Navigable information pages through links

+ Information entry forms; these forms can be submitted to

several times for confirmation or reporting errors

6.3.2 The Controller

These are the controllers that will listen to user requests and thus provide the corresponding

external view. For this, it will be necessary at all times to know the state of the application

i.e. the context of the request: "the requested page follows what precise action of

the user?" It is up to the controller to know the application state by testing a variable which

will be

named $action, coming from a POST or GET request.

6.3.3 The Model

It is the layer (function or class library) that accesses the database.

(see the figure 11)

6.4 Presents Our Home Page
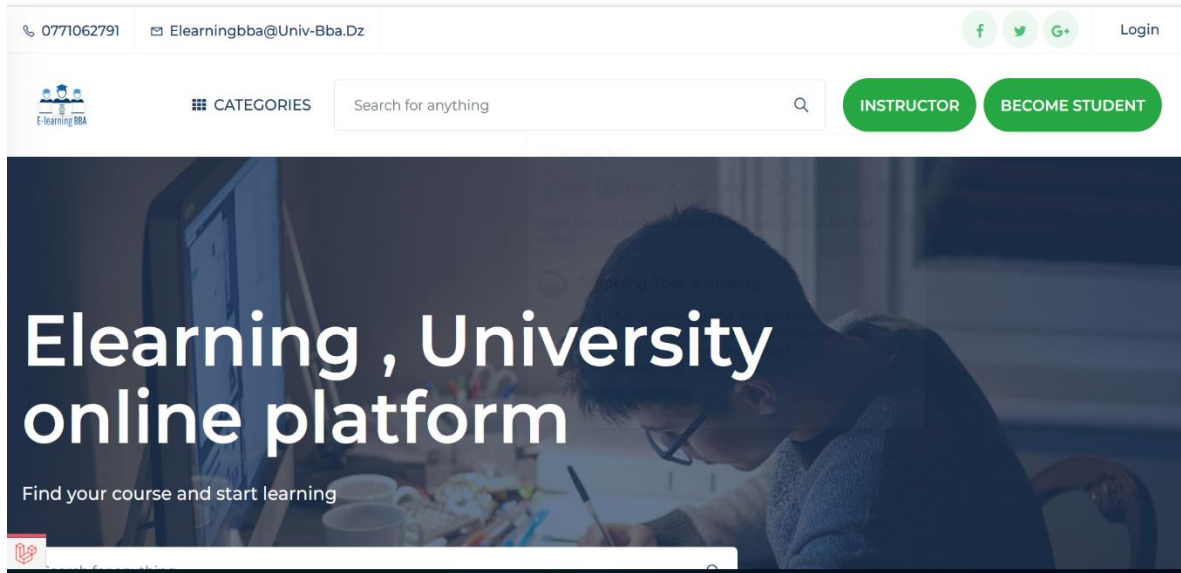
Figure 12 Home page of our E-Learning platform.
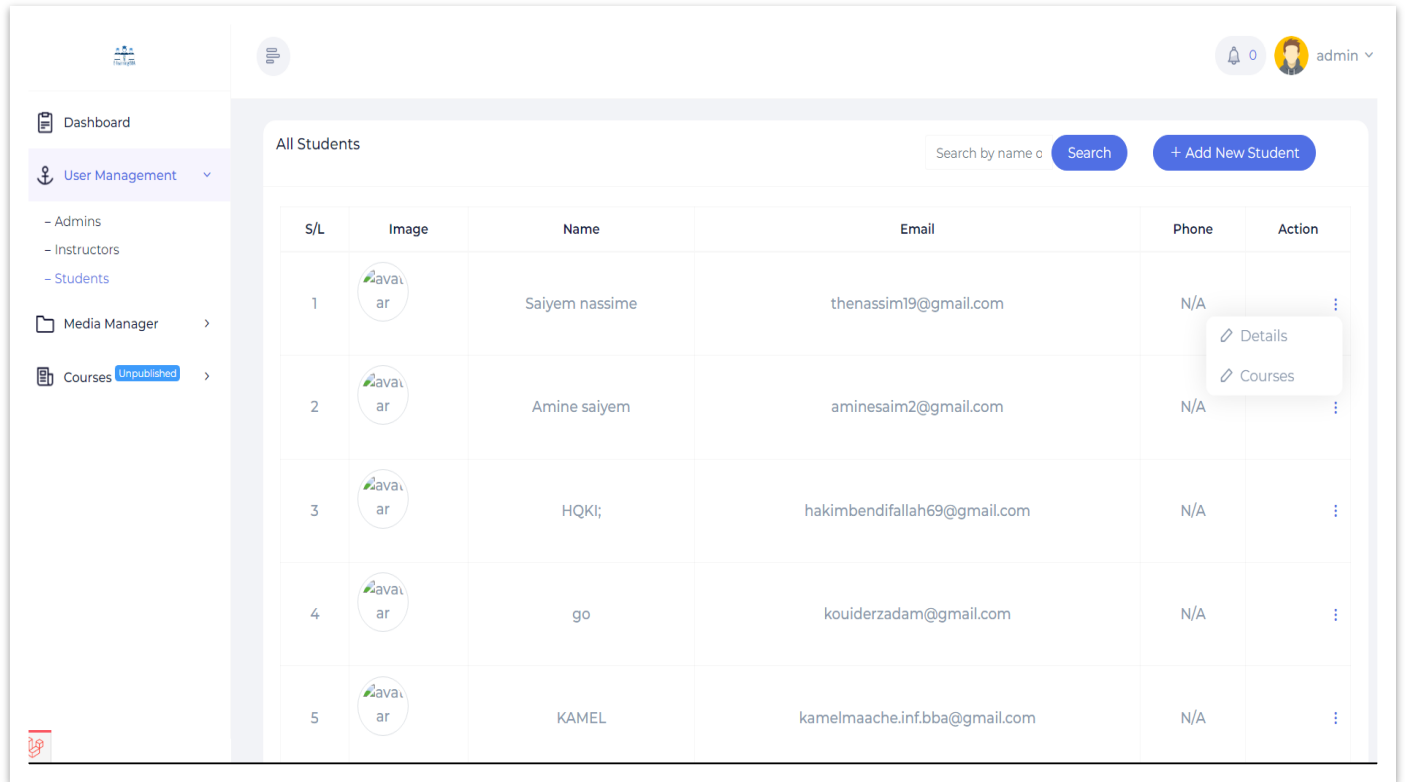
These images represent the interface of our project, which contains all the offers available to the user to use. It also contains the login for each of the admins, the teachers, and the students. It also shows all the contents of the students that the teachers publishes, as well as our informations at the bottom of the screen.(**see the figure 12**)

6.5 The Most Important Functions Of Administrator
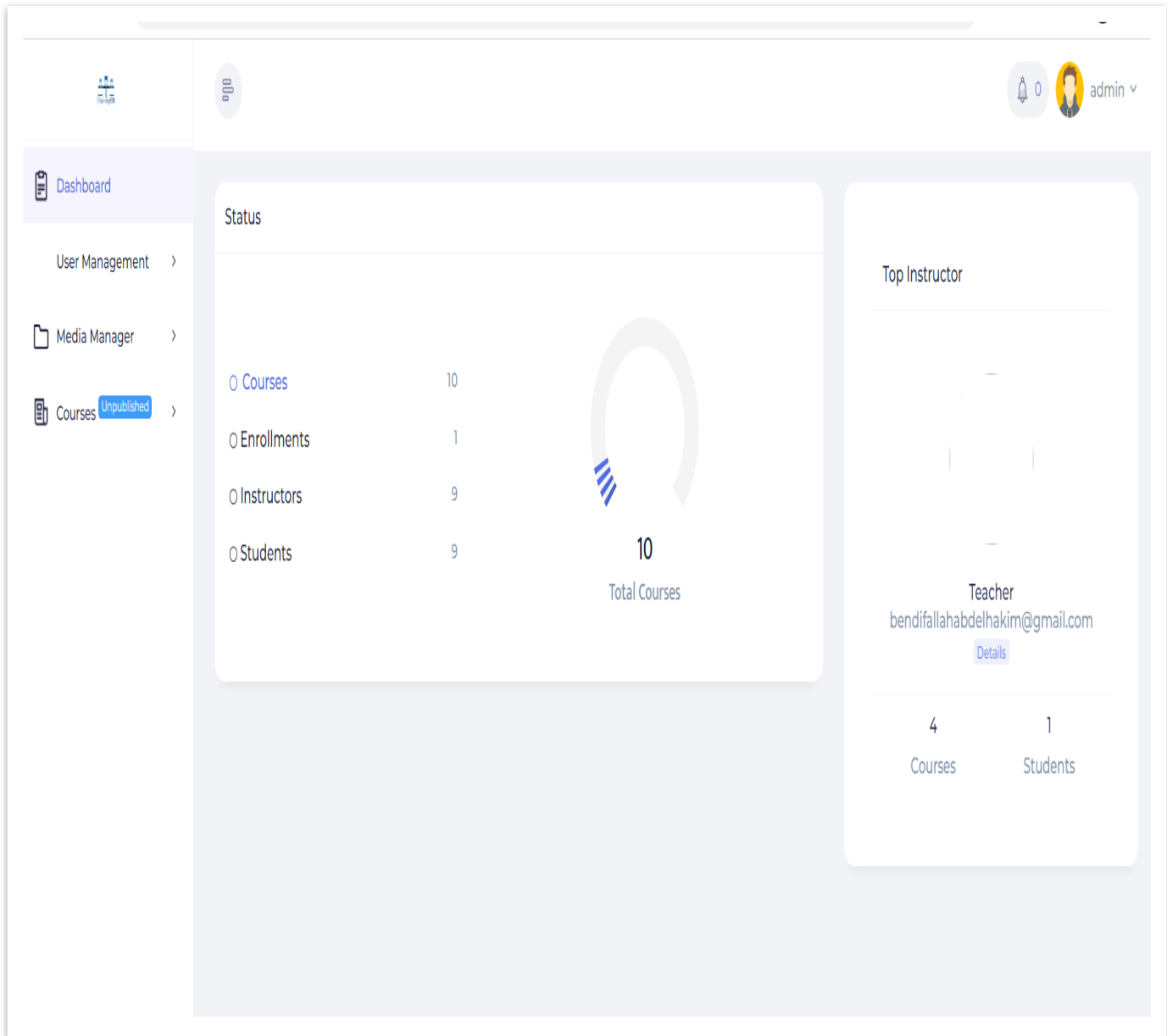
Figure 13: dash board

When admin clicking on" user management" and then pressing on" students", the list of registered students will appear to the administrators, and also can add students to the platform by pressing "add New student ".**(see the figure 13)**

Figure 14 : List of registered students

When admin clicking on" user management" and then pressing on" instructors", the list of registered teachers will appear to the administrators, and also can add students to the platform by pressing "add New instructors ".**(see the figure 14)**
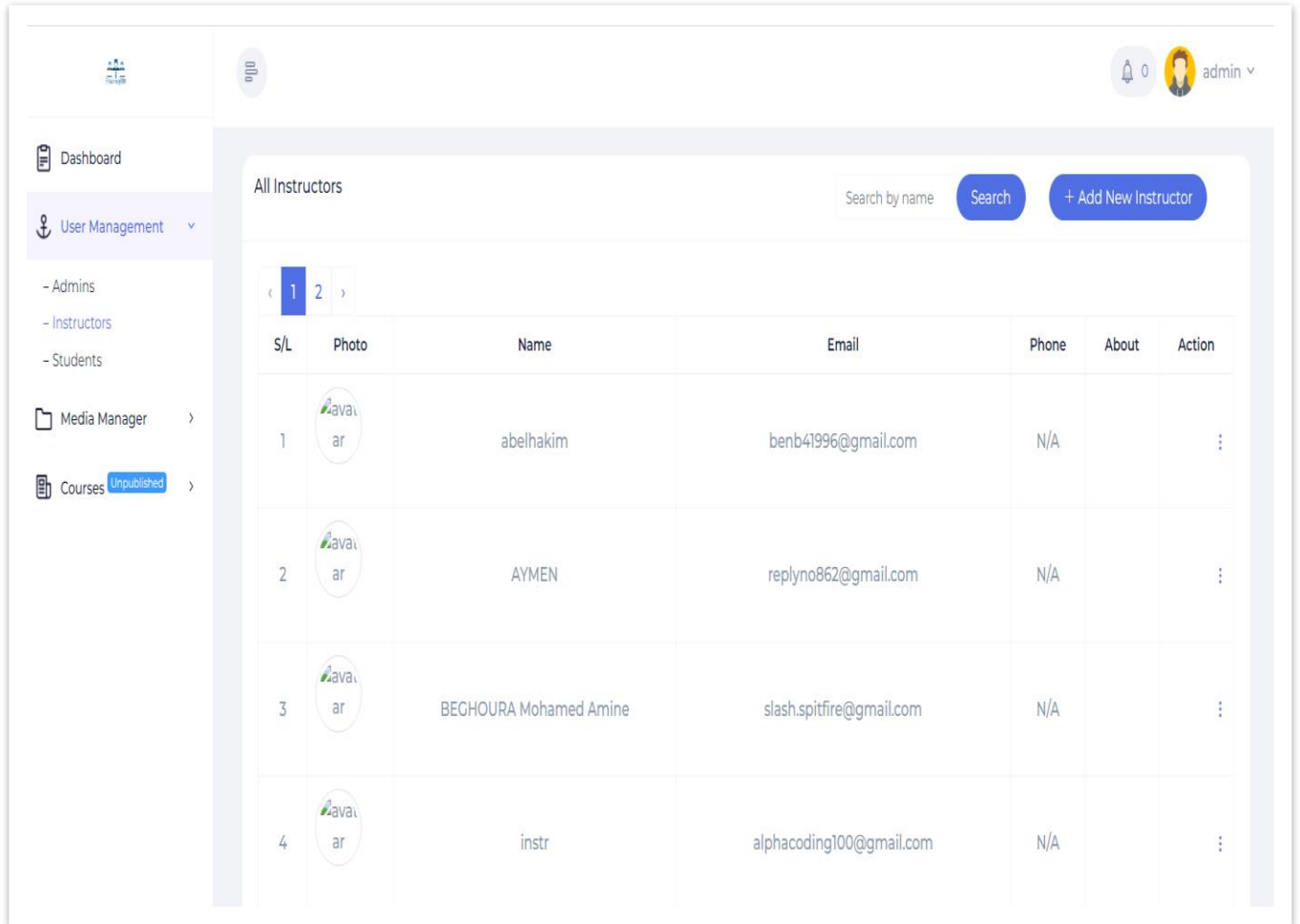
Figure 15 : List of registered teachers

Admin presses on "courses" then "All courses" the page of all the courses that have been published by the professors appears for him, where he is the one who gives approval to publish or cancel them.**(see the figure 15)**
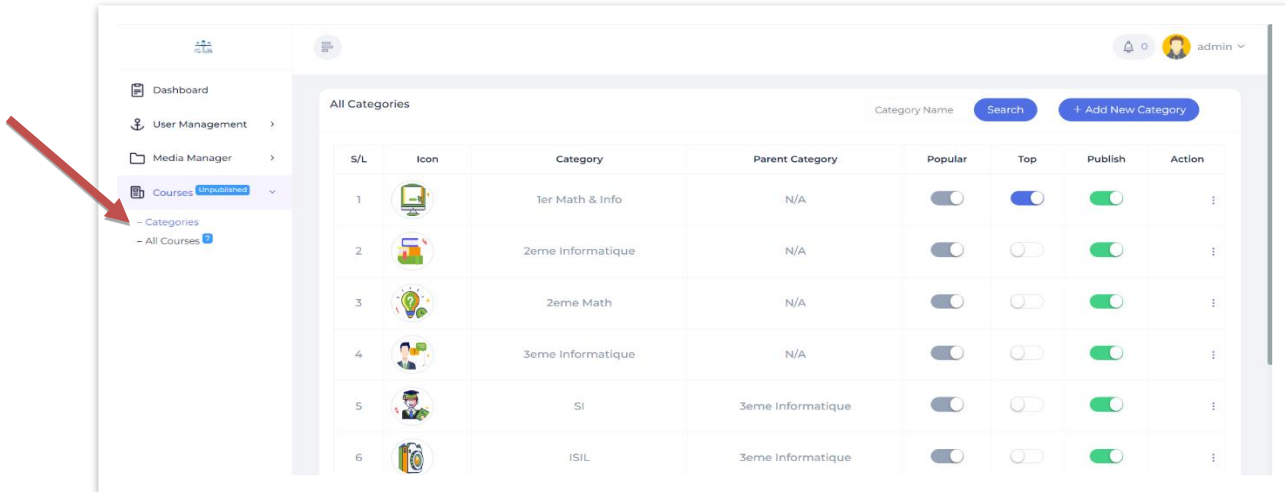
Figure 16 : courses posted

Here, the admins will add the categories and levels in which the courses are placed and published on the platform interface.**(see the figure 16)**

5.6 The most important functions of students :

In this part, we will explain all functions available to the student to use
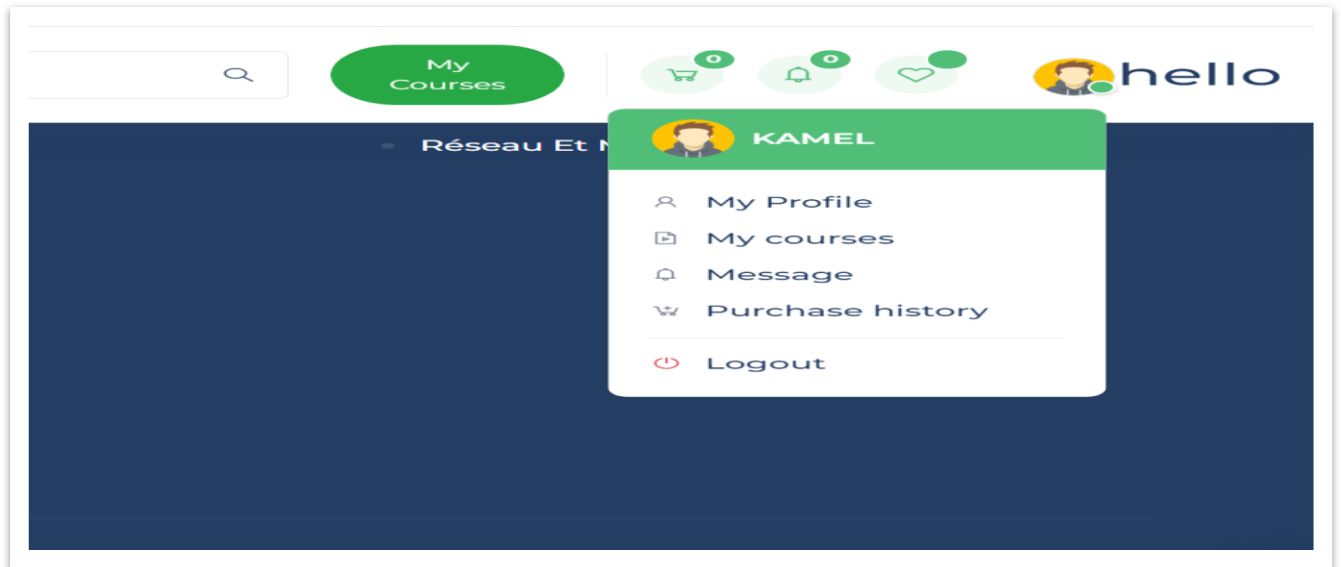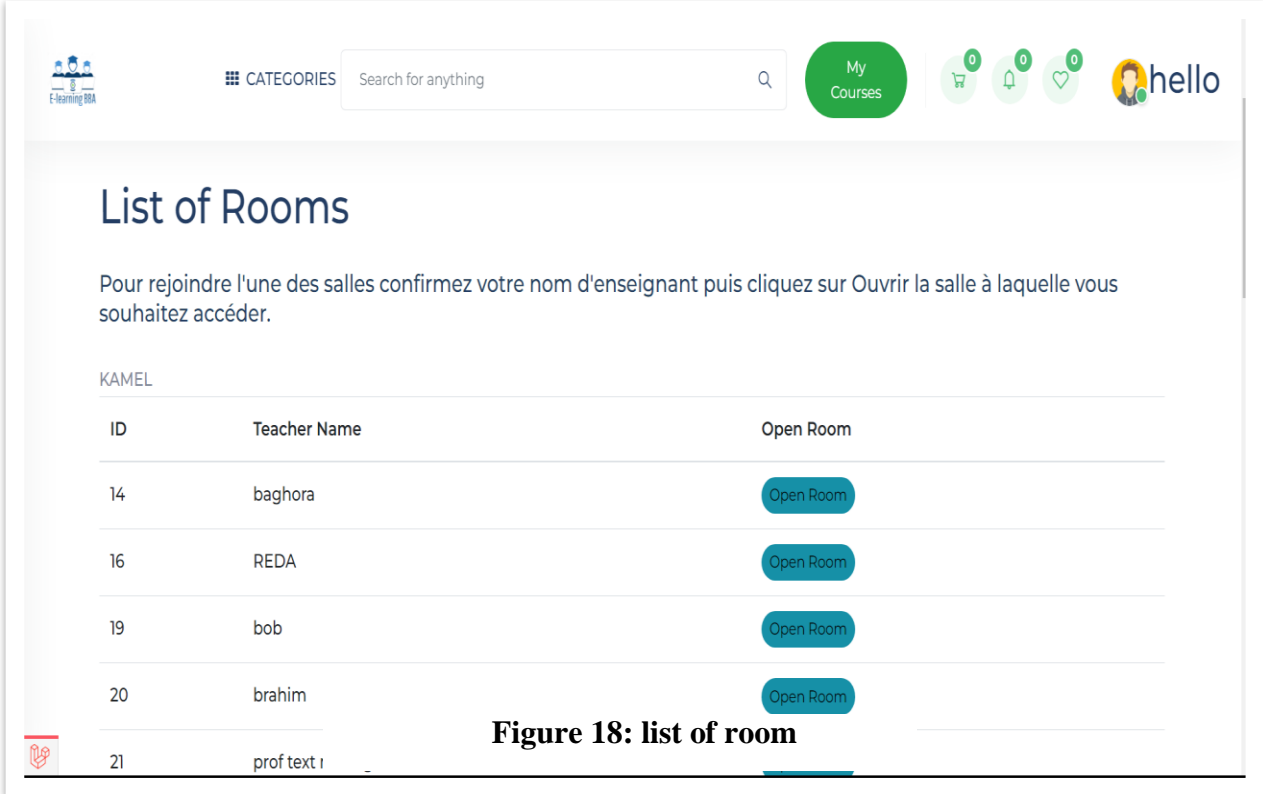
Figure 17 : profile

When the student enters his personal account, he finds all his information,the student presses the "**My courses**" button, after presses "**all courses**" which allows him toenter all available courses.**(see the figure 17)**

Figure 18: list of room

The student presses the "**My courses**" button, after presses "**Room**" which allows him to enter to the list of room,As shown in the **figure 18**

.
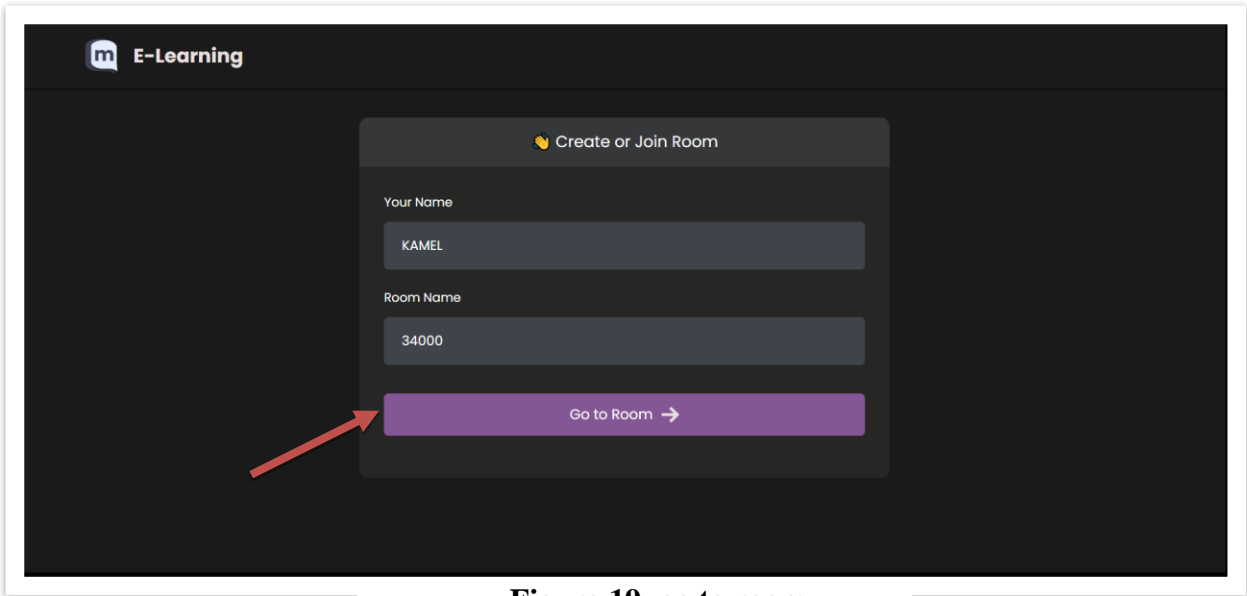
Figure 19 :go to room

On this page, the student will see the live that the professor is posting online. **(see the figure 19)**
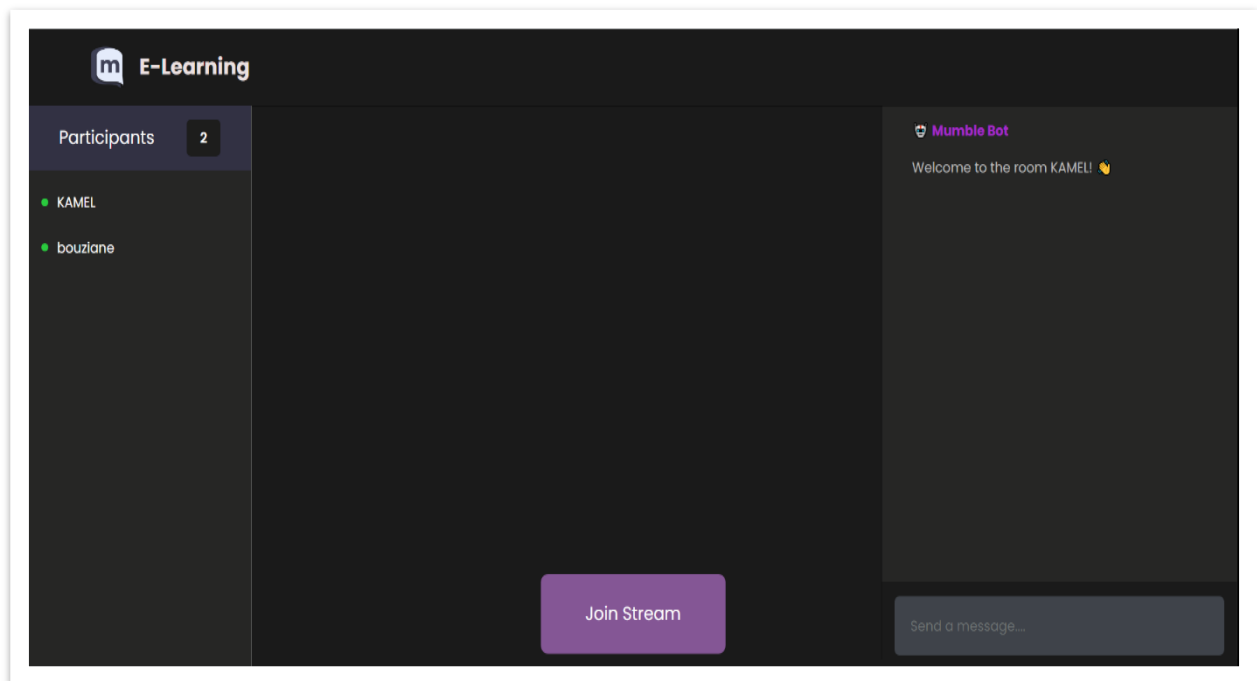
Figure 20: join to stream

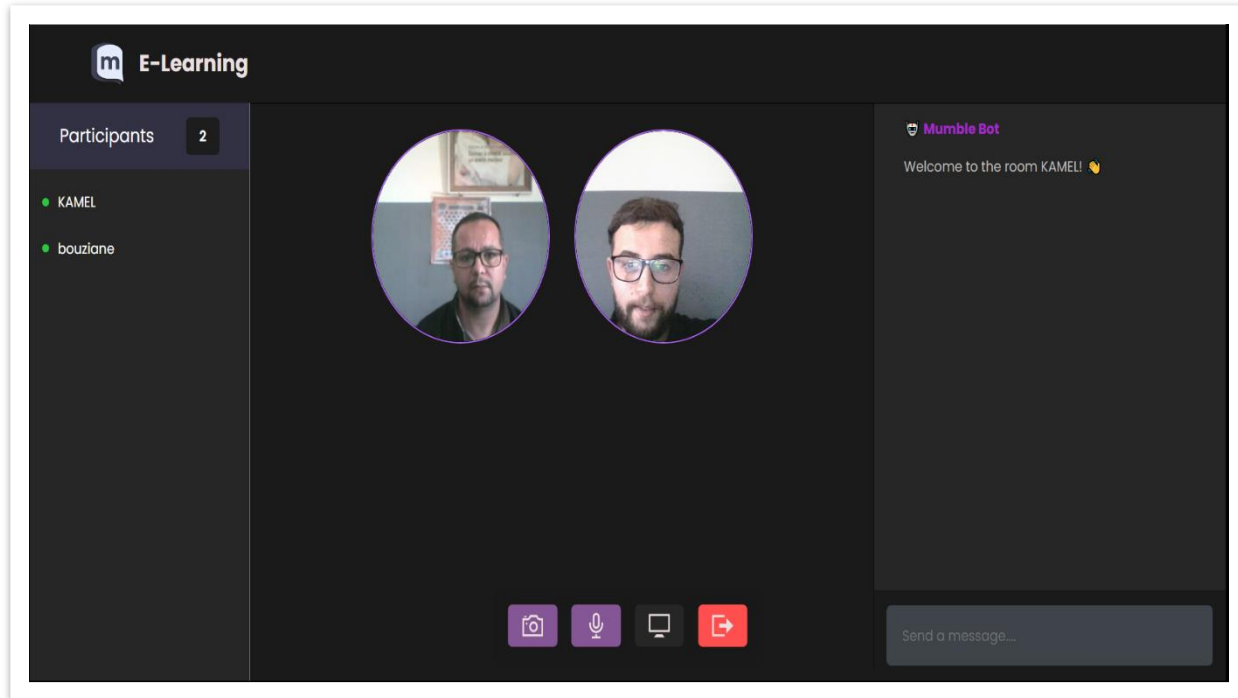The student enters automatically by pressing the " go to room " button, where he finds information about the live direct set by teacher **(see the figure 20)**

Figure 21: live

The student presses "**Join Stream** " button, as shown in **Figure 21**, to allow him direct access to the live as shown **in Figure 22**
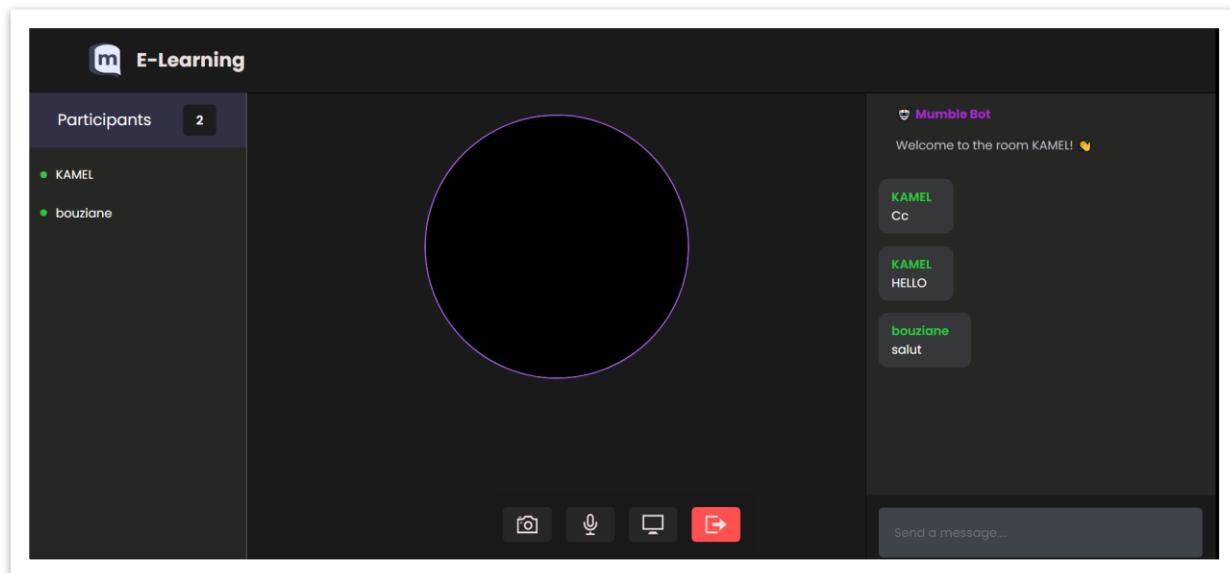
Figure 22 : home page of room

During live, the student can mute the sound, as well as send messages to his colleagues or to his teacher, while sharing his screen to the various students or teacher.
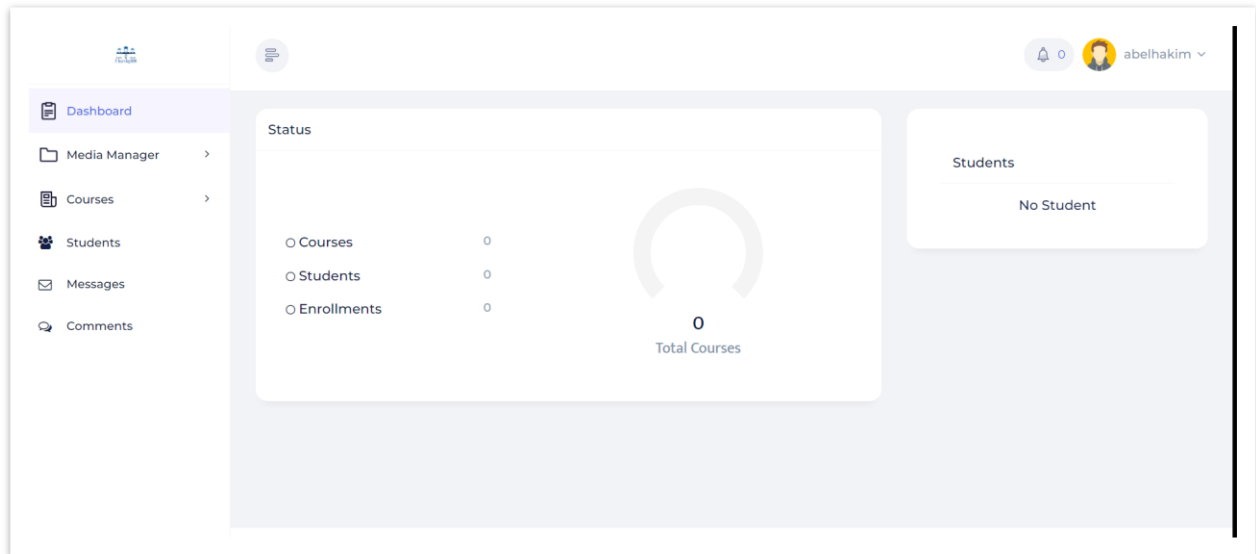He can also exit the live by pressing the red button shown on the screen(**see the figure 22**)

# 6.7 The Most Important Functions Of Teacher:

In this part, we will provide a comprehensive explanation on how the teachers uses the platform, as well as how to use the application descktop in which the live is broadcast.

6.7.1 Platform eLearning part:


Figure 23 : dashboard of teacher

This interface shows all the information about the teachers, in addition to displaying the number of registered students and the functions that can be used, and through which courses can be published.**(see the figure 23)**
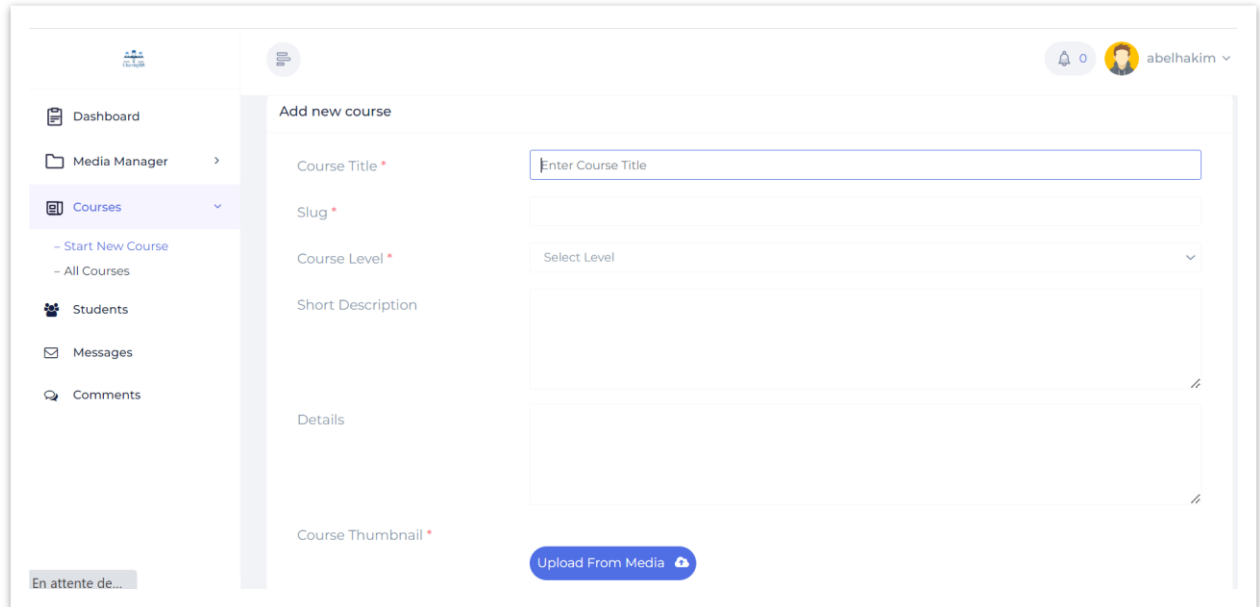
Figure 24 : Course information.

After the teacher enters his personal account, he clicks on "**courses**" then "**Startnewcourse**" .

The professor fills in the course information as shown in the figure.(**see the figure 24**)
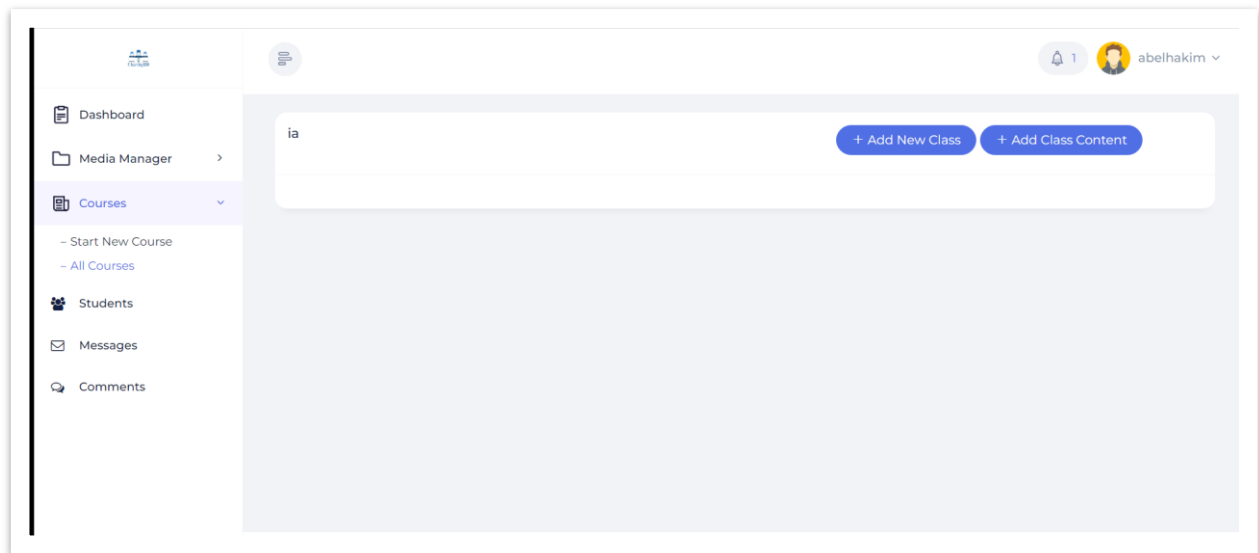
Figure 25 : Add courses

The teacher presses the button 'add new class' to add the class. (**see the figure 25**)

The instructor will include the course content, selecting the

Categoryandcourse duration

After the process of including most of the information, the feature of waiting for activation by the administrators appears.**(see the figure 26)**
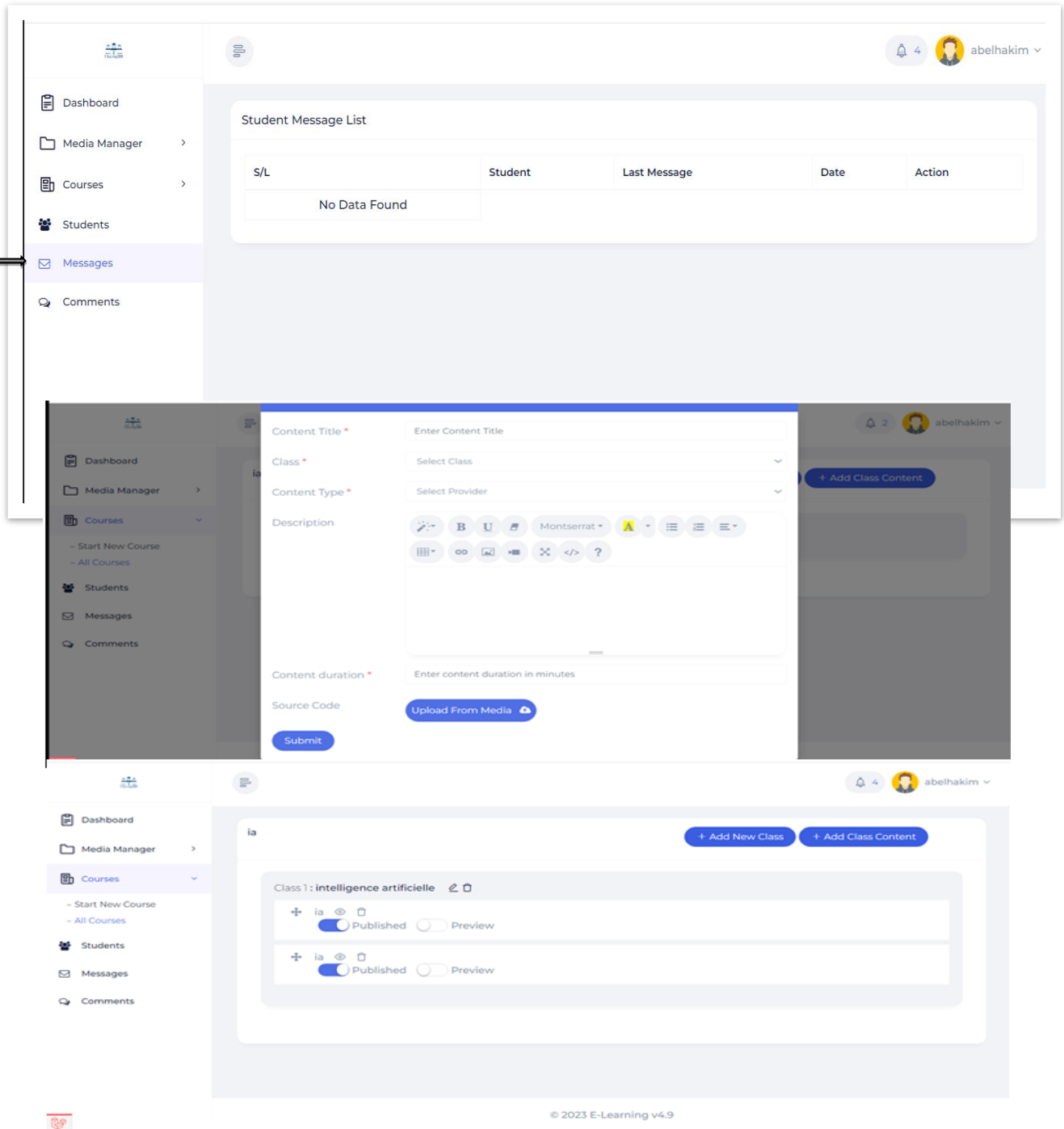
The teacher can view all the messages sent to him by the students.**(see the figure 27)**
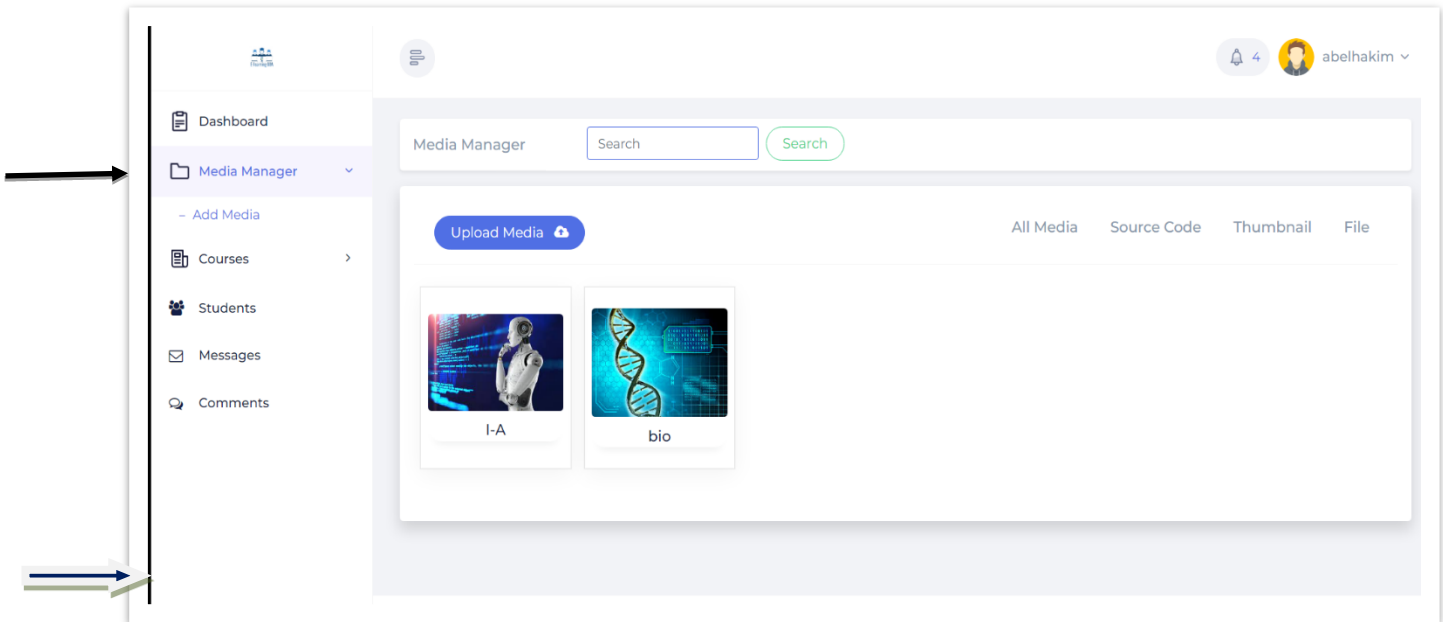

Figure 28:media manager.

The teacher can insert various media and upload the video that was recorded in the live broadcast.

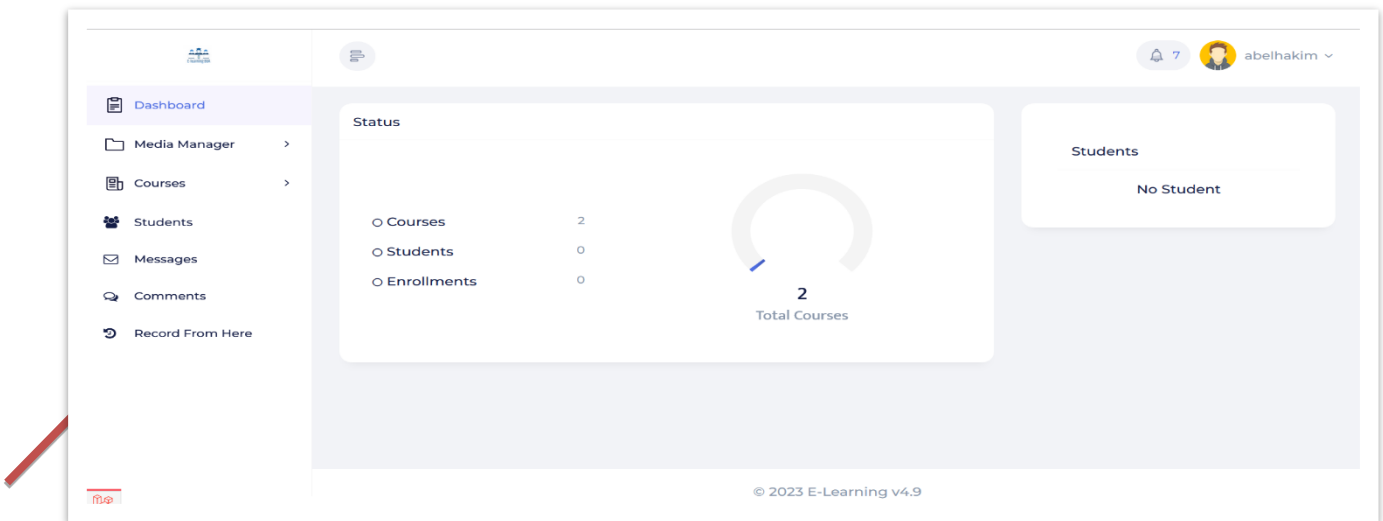The teacher can view all the messages sent to him by the students. **(see the figure 28)**

Figure 29 recording video.

The teacher presses the "**button record from here**" as shown in Figure**(see the figure 29).**

At this stage, the teacher plays the recording of the live broadcast from the platform and accesses the application descktop after the end of the live broadcast, the teacher download the video and inserts it into the platform as shown in the figure**(see the figure 30).**

6.6.2Application descktop part

In this application, he uses a special descktop by using live broadcasting, which allows him to offer remote courses and communicate with students at the same time and in real time
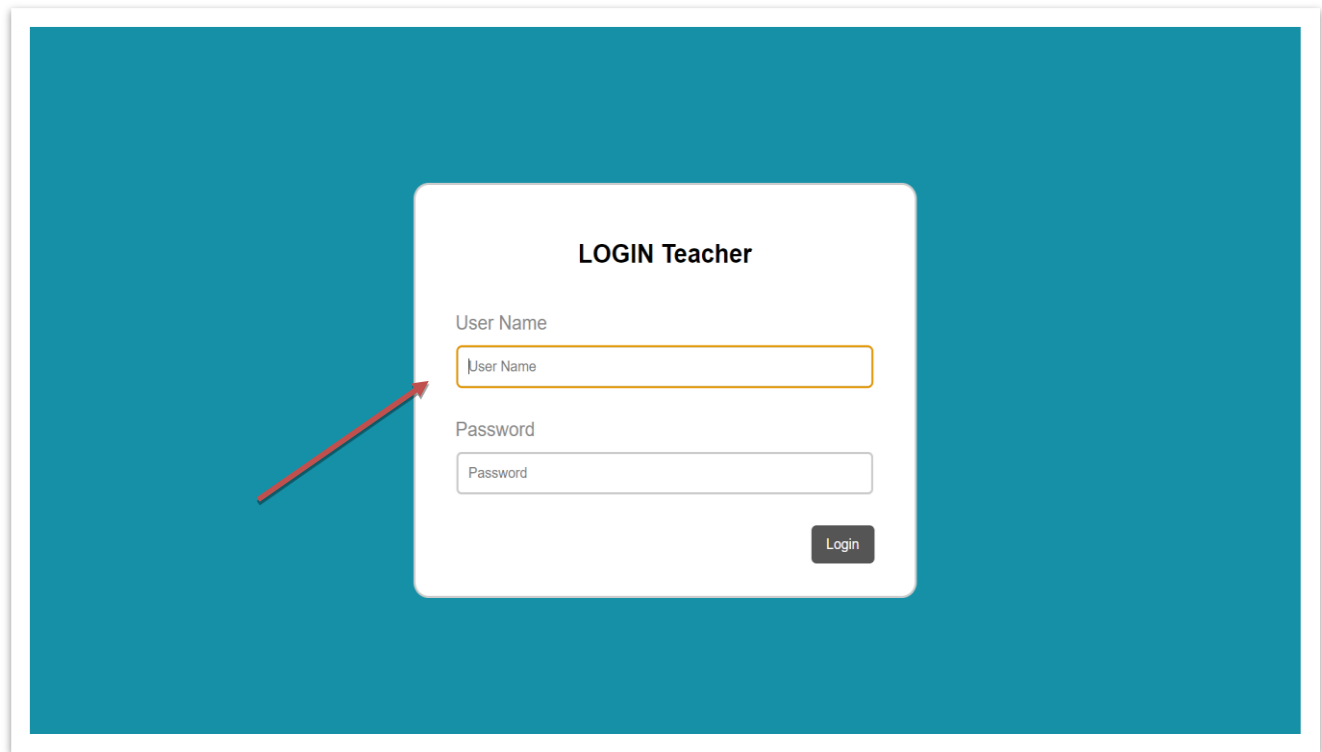
Figure 30 :login

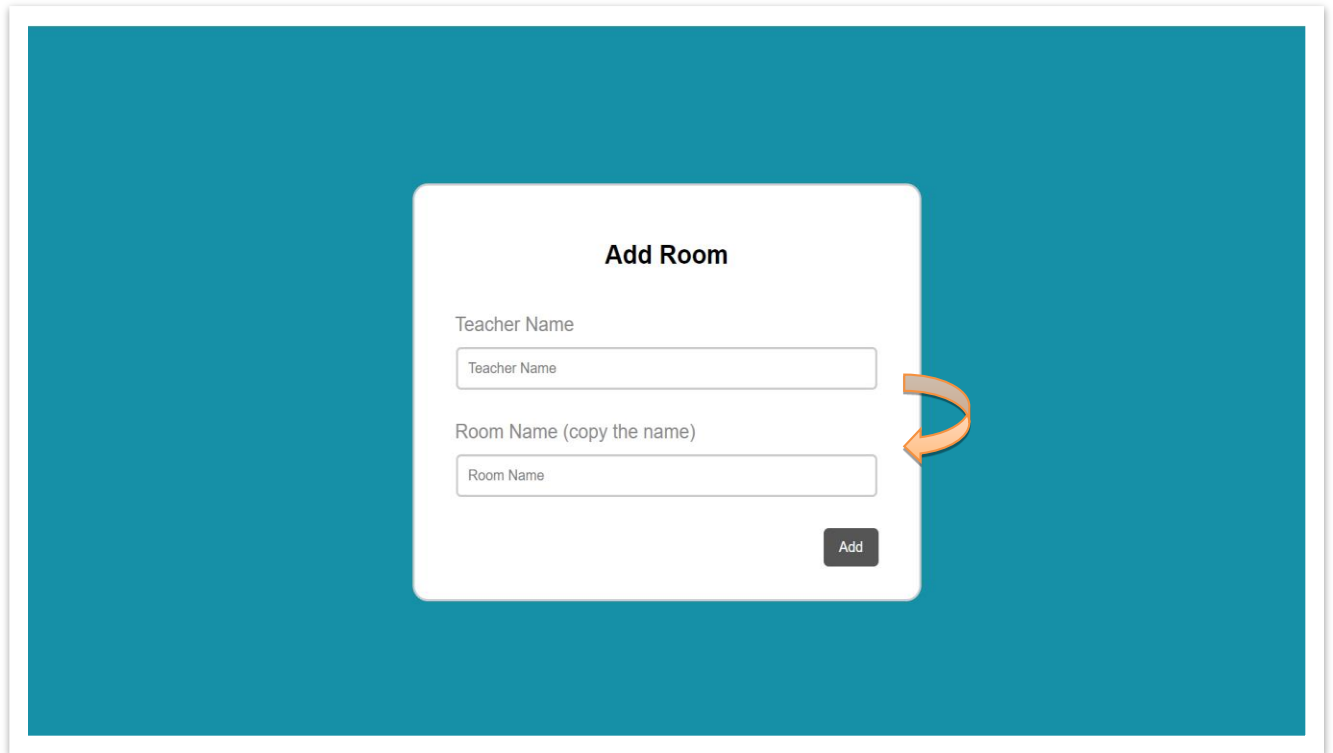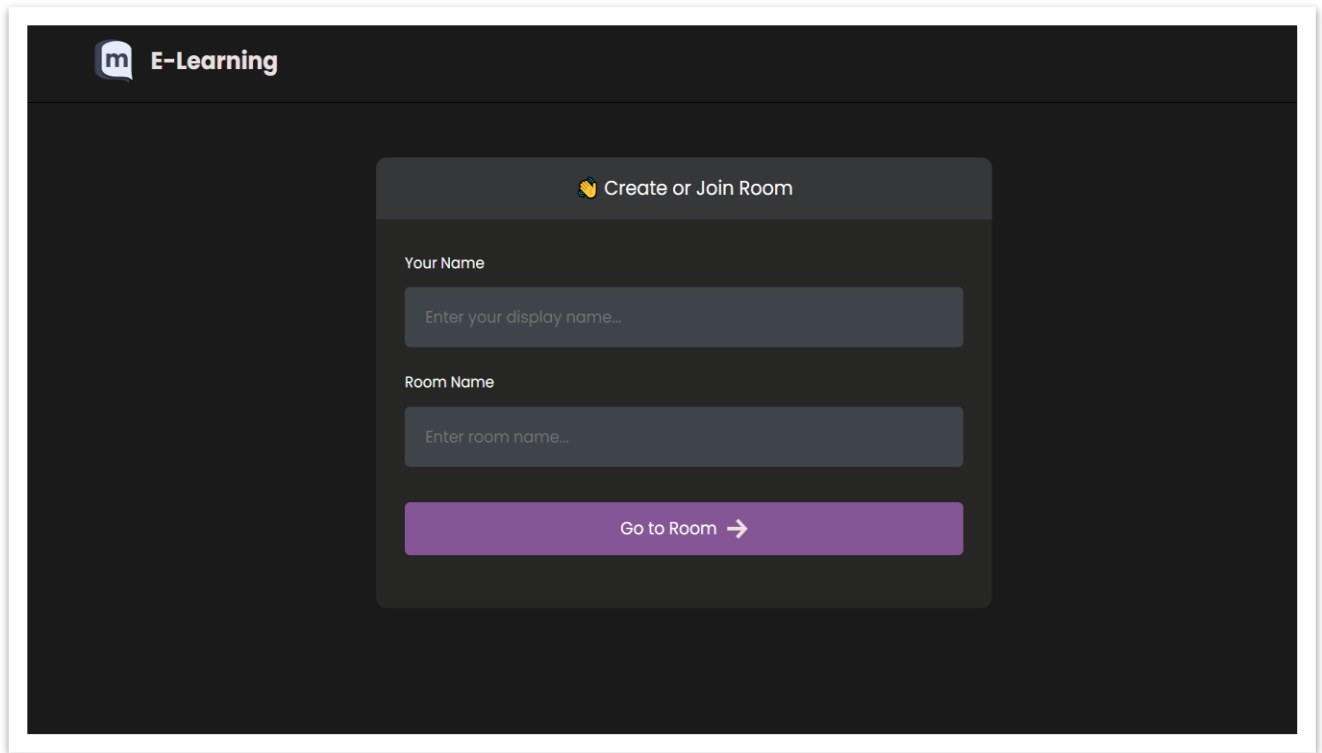The teacher enters the username and password**(see the figure 30).**

Figure 31 :add room

The teacher enters the username and gives a special name to the broadcasting room. **(see the figure 31).**

Figure 32: add room

The name of the professor and the name of the room for the broadcast are entered, which will appear to students on the platform, where students can access the broadcast**(see the figure 32).**
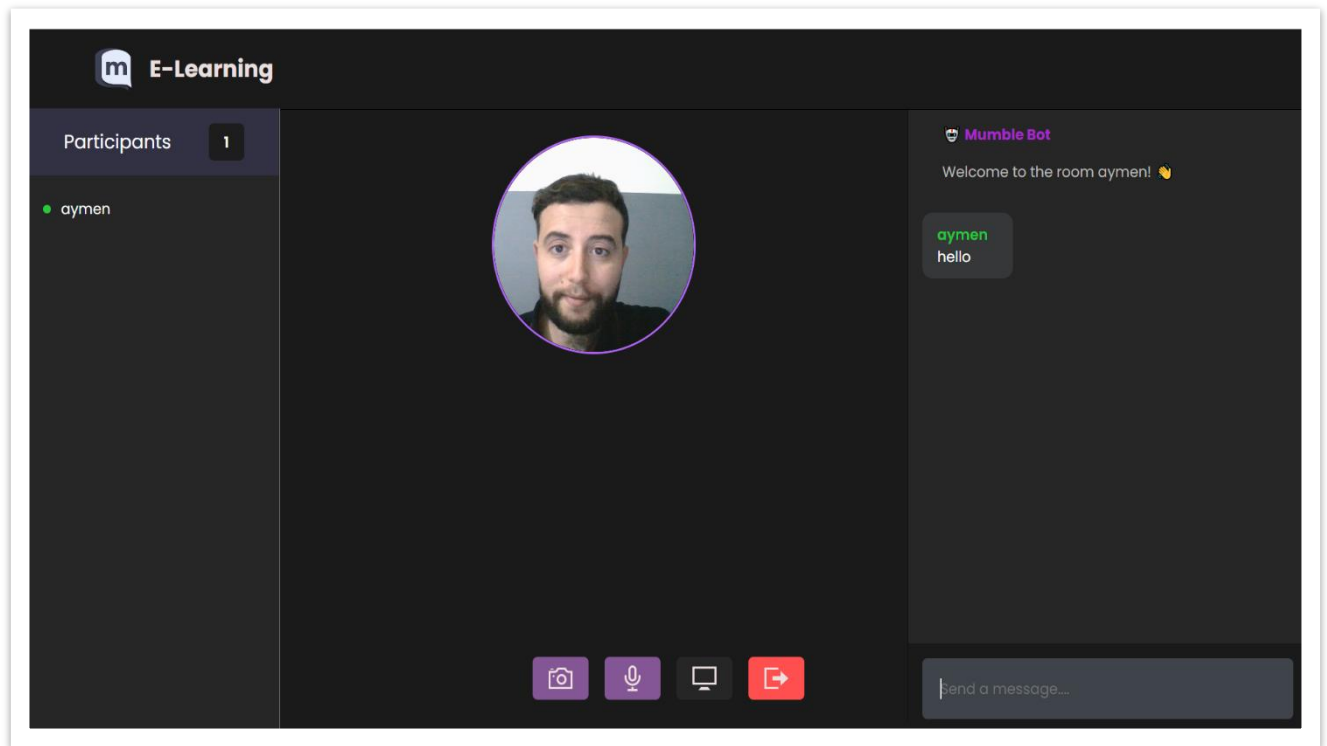
Figure 33 : Start live

At this point, the live broadcast is initiated by the teacher.**(see the figure 33).**

Conclusion

In this chapter, we were able to present the environment and the development process.

We have thus exposed the result of development using the screen previews, Finally we

close this dissertation with a general conclusion.

General Conclusion

General Conclusion

Contributions:

Enhanced Communication: The integration of chat and video features in e-learning platforms enables real-time communication between instructors and learners. This fosters a more interactive and engaging learning experience, allowing students to ask questions, seek clarification, and participate in discussions with their peers and instructors.

Accessible Education: E-learning platforms with chat video features have contributed to making education more accessible. Students can participate in virtual classrooms and access educational resources from anywhere, overcoming geographical barriers. This accessibility benefits learners in remote areas, individuals with disabilities, and those with other commitments that make traditional classroom attendance challenging.

Flexibility and Convenience: E-learning platforms with chat video capabilities offer flexibility and convenience to learners. They can choose when and where to access the learning materials and participate in discussions, accommodating various schedules and time zones. This flexibility allows learners to balance their education with work, family, and other commitments.

Limitations:

Technical Issues: One of the main limitations of eLearning platforms with chat video is the potential for technical difficulties. Poor internet connections,

Learning Styles and Preferences: While chat video can facilitate real-time interaction, it may not cater to all learning styles and preferences. Some individuals may prefer different modes of communication or learning formats that are not fully supported by chat video features. .

Communication Barriers: Language barriers can hinder effective communication in chat video sessions, especially when learners and instructors come from diverse linguistic backgrounds. Differences in accents, fluency levels, or technical jargon may lead to misunderstandings and difficulty in conveying complex concepts accurately.

Lack of Physical Resources: Some subjects, such as laboratory experiments or hands-on activities, require physical resources and equipment that may not be easily accessible in an eLearning environment. The absence of these resources can limit practical learning experiences and impact the depth of understanding in certain fields.

Future Work And Perspectives

The future of e-learning with chat video holds several promising possibilities and potential advancements.

Here are some future work and perspectives regarding this approach:

Immersive virtual reality (VR) integration: As VR technology continues to advance, incorporating immersive VR experiences into chat video e-learning platforms could provide highly engaging and interactive learning environments.

Learners could explore virtual worlds, conduct experiments, and engage in realistic simulations, enhancing the educational experience.

Artificial Intelligence (AI) integration: AI technologies can play a significant role in e-learning with chat video. AI-powered chatbots and virtual assistants can provide personalized support, answer questions, and assist learners in real-time. Natural language processing algorithms can analyze learner interactions to identify areas of improvement and suggest tailored learning resources.

References:

1 - http://dx.doi.org/10.3991/ijet.v11i06.5644

2- https://doi.org/10.46328/ijte.36

3- https://doi.org/10.32604/csse.2021.015261

4- http://creativecommons.org/licences/by/4.0/legalcode

5- International Journal of Technology in Education (IJTE), 4(1), 68-92.

6- https://doi.org/10.46328/ijte.36

7-https://www.semanticscholar.org/paper/Providing-Adaptive-Courses-in-Learning-

Management

8-Australasian Journal of Educational Technology, 2017, 33

9-Service-Oriented E-Learning Platforms From Monolithic Systems to Flexible Services

10- https://doi.org/10.20944/preprints202103.0313.v1

11-http://dx.doi.org/10.3991/ijet.v11i06.5644

12- R. Software. (2015, April 11). SCORM Explained [online].

13-[online]. Available: http://anisakai.com/wpcontent/uploads/2014/04/Why_SAKAI.pdf.

14 https://www.techtarget.com/searchcio/definition/learning-management-system

15- Educational Disruption and Response. Available online: https://en.unesco.org/covid19/ educationresponse (accessed on 8 May 2020).

16- https://doi.org/10.1016/j.compedu.2013.10.009

17- https://www.techtarget.com/whatis/definition/Web-based-training-e-learning

18- Shangzhen YANG, Dan LIU. E-learning and Visual Reality. China Modern Education quipment. (2007) Vol.7.pp:16-17,42

19- https://blog.udemy.com/xampp-tutorial/

20- https://www.hostinger.fr/tutoriels/quest-ce-quapache-serveur-web-apache

21- https://dev.mysql.com/doc/refman/8.0/en/what-is-mysql.html

22- https://www.one.com/en/hosting/what-is-php

23- https://developer.mozilla.org/en-US/docs/Web/CSS

24- https://www.w3schools.com/html/

25- https://www.hexium.io/blog/pourquoi-utiliser-le-framework-PHP-larave

26- https://code.visualstudio.com/docs

27- https://medium.com/@maha1993b/java-script-27a23c9a700f

28- https://docs.agora.io/en/

29- https://www.jetbrains.com/fr-fr/phpstorm/

30- https://developer.mozilla.org/en-US/docs/Glossary/MVC

Appendix

1 Startup Directory

2 Business Model Canvas. (BMC)