ISTANBUL ALTINBAS UNIVERSITY

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TPS:DEVELOPING A WEB BASED HOMEWORK MONITORING SYSTEM (Teacher,Parents,Student) FOR IRAQI SCHOOLS

M.Sc. THESIS

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TPS:DEVELOPING A WEB BASED HOMEWORK MONITORING SYSTEM (Teacher,Parents,Student) FOR IRAQI SCHOOLS

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Istanbul, 2018

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I hereby declare that all information in this document has been obtained and presented in accordance with academic rules and ethical conduct. I also declare that,as required by these rules and conduct, I have fully cited and referenced all material and results that are not original to tish work.

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DEDICATION

This project would not have been possible without the support of many people. Many thanks to my adviser, Assoc. Prof. Dr. Sefer Kurnaz, who accept to school for graduate program and helped make some sense of the confusion. Also thanks to my committee members, who offered guidance and support. Thanks to the University of Altinbas for this possibility. And finally, thanks to my partner who endured this long process with me, always offering support and love.

Name Surname

Shadha Adnan ALsaadi

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ABSTRACT

TPS:DEVELOPING A WEB BASED HOMEWORK MONITORING SYSTEM (Teacher,Parents,Student) FOR IRAQI SCHOOLS

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The world wide web affects education and our live in many ways. Nowadays, web-based homework has become widespread in several countries. Web-based homework systems in developing information technologies have many advantages compared to paper-pencil homework. The use of web-based homework systems eases the work of teachers, provides comfort to students, and ensures that parents are aware of their children's situation. The aim of this study is to create a new web based homework system (**TPS** teacher parent's student system) produce for Iraq schools. This system will be divided into three sections.The first section will be for the teachers. Teacher will be able to create homework, upload any video to illustrate their lessons, receive questions from students through the chat about the homework and the teachers can see a report of students performance. The second section is for students: the students can answer questions through the interface and can see the result immediately. The third section will be for parents, parents can follow their children by receiving reports about their children performance.

In the first chapter of this study, the importance and the aim of the study were mentioned and the related researches and applications made in this area were given. In the second chapter, the web development tools such as JavaScript libraries, programming languages and databases required for the system to be developed and the Xammp server to be used in this study as a local server have been introduced. In the third chapter, the details of a new web based homework system (**TPS** teacher parent's student system) developed for Iraq schools are explained. Finally, in chapter fourth, presented comparison the TPS system with another web based homework system.

Keywords: TPS Teacher,Parent,Student System e-Homework

ÖZET

TPS:IRAK OKULLARI İÇİN GELİŞEN WEB TABANLI EV ÖDEVİ İZLEME SİSTEMİ

(Öğretmen,ebeveyin,öğrenci)

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Danışman

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Dünya geniş ağı,birçok şekillerde eğitimi ve hayatımızı etkilemektedir.Son günlerde,web tabanlı ev ödevi birçok ülkelerde yaygınlaşmıştır.Gelişen bilgi teknolojilerindeki web tabanlı ev ödevi sistemleri kağıt,kalem ev ödevi ile kıyaslandığında bir çok avantajlara sahiptir.Web tabanlı ev sistemlerinin kullanımı öğretmenlerin işini kolaylaştırmaktadır,öğrencilere rahatlık sağlamakta ve ebeveyinlerin çocuklarının durumlarından haberdar olduğunu temin etmektedir.Bu araştırmanın amacı,Irak okulları için yeni web tabanlı ev ödevi sistemi üretimini oluşturmaktadır(**TPS** öğretmen ebeveynin öğrenci sistemi).Bu sistem üç bölüme ayrılacaktır.İlk bölüm öğretmenler için olacaktır.Öğretmen ev ödevini oluşturabilecek,derslerini örneklemek için herhangi bir video yükleyecek,ev ödevi hakkında yapılan konuşma ile öğrencilerden soruları alacak ve öğretmenler öğrenciler performansı ile ilgili bir rapor da görebileceklerdir.İkinci bölüm öğrenciler içindir:Öğrenciler ara yüz ile soruları cevaplayabilmekte ve sonucu hemen görebilmektedir.Üçüncü bölüm ebeveyinler için olacaktır,ebeveyinler çocuklarının performansı hakkında raporlar alarak çocuklarını izleyebilmektedirler.

Bu çalışmanın ilk bölümünde,çalışmanın önemi ve amacı açıklanmış ve bu alanda yapılan ilgili araştırmalar ve başvurular verilmiştir.İkinci bölümde Java Script kütüphaneleri ,programlama dilleri ve sistem için gerekli veri tabanları gibi web gelişimi araçları geliştirilecek ve yerel bir sunucu olarak kullanılacak Xammp sunucusu tanıtılmıştır.Üçüncü bölümde,Irak okulları için geliştirilen yeni tabanlı ev ödevi sisteminin (**TPS** öğretmen ebeveynin öğrenci sistemi)ayrıntıları açıklanmıştır. Son olarak,dördüncü bölümde TPS sistemi ile diğer web tabanlı ev ödevi sistemi arasındaki kıyaslama sunulmuştur.

Anahtar kelimeler: TPS öğretmen,ebeveyin,öğrenci sistemi ev ödevi

LIST OF ABBREVIATIONS

TPS   Teacher Parents Student

UI   User Interface

CSS   cascadind Style Sheet

JS   JavaScript

MVC   Model-View – Control

ASP   Active Server Page

SPA   Single Page Application

JVM   Java Vıtual Machine

SQL   Structure Query Languge

NoSQL   Not Only Sql Database

RDBMS   Realtional Database Management system

JSON   Java Script Object Notation

LAMP   OS:linux ,Server Apache, DB MySql,PHP languge

MAMP   OS:Mac ,Server Apache, DB MySql,PHP languge

WAMP   OS:Windoes ,Server Apache, DB MySql,PHP languge

SaaS   Softwere-as-a-Server

FTP   File Transfer Protocol

RESTFUL Service Representation Stat Transfer

XML   Extensible Markup Language

CHAPTER ONE

1.1.INTRODUCTION

The advancement of internet such as cheapest network system of the internet network, independent use of space, to be able to work over internet browsers without the need to install application, updates were made in practice instantly visible to everyone, no operating system and hardware obligation and can also be used on mobile devices enabling us to develop new learning and learning techniques that cannot be in the past, for example using simulations in teaching. Obviously, the general trend to move toward the incorporation of computer in education [1]. One of the areas of interest is the Web-based homework.It makes the learning process is more important to students.In addition, reducing the workload of teachers and Web-based homework also improve student performance in exams[18].

Modern day technology allows and creates opportunities for a vast array of new tools in the learning path. These are tools that have been enhanced by the internet [2]. Publisher Wiley; offers a set of online learning tools known as The Wiley PLUS Assessment conducted by the Tennessee University's Institute for Assessment and Evaluation which has found the final averages of students by applying these tools which were percent higher than students who did not [4] [3]. Some studies have found the e-homework to have a more positive impact on student performance than the old traditional homework system [7].

Chua-Chow, Chauncey, and McKessock testing and online business statistics for testing the use of homework [8],[19]. will be the results clearly indicate that all participants in the promotion to higher class's work online, and when the final letter grade decreases percent decrease Can students. In General, use and improve the chemistry homework. Students are more likely to complete their assignments, they are worthwhile and online homework, has recommended continuing use [9]. Other studies, Web-based assignments for students showing significant differences between the original grade can be found [10].

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Whether web-based jobs lead to higher test scores or not it is good for both students and teachers. Students receive immediate feedback; The teacher spends less time on collecting, grading, archiving and recording [11]. (Bridge and Appleyard (2008) Report, 88% students in their research thought, submitted the homework time electronically saved the time [12], [13]. (Time management) another note; is the advantage of electronic operation, has the ability to design and write homework according to the needs of individual students [14].

In order to strengthen students ' behavior in school and classroom environment, behavior should be supported in non-school settings. In the 21st century, the education process supports methods of removing students from memory by taking student centers and actively participating in the learning process [15], [16]. In this regard, homework is the most common and best extracurricular educational activity. All teachers frequently use homework methods and try to get students to find information rather than somewhere ready. It can be said that homework is an important position in the education system, enabling students to strengthen and construct knowledge by enabling them to be active in the process[17].

Some web-based homework system has been developed that serve only to provide homework and grade. For instance, Webwork is an open source web-based homework system that provides online homework submission and grading services.It is developed much rather for mathematical homework that the student provides the solution online .thereby, Webwork is not suitable for all type of homework [19].

On the other side, in the web-based homework submission system developed by Hsu(HWSAM) the homework sent by the student is submitted to the instructor as a file and document hierarchy [20]. Each homework document is collected in a relevant course file.group submission feature has also been considered but the simple and inefficient interface of the system makes it fairly difficult to interact with the different system.[21].

As it can be seen from the studies detailed above, there are systems which allow web-based homework, However, they are not able to fully satisfy the needs of a certain schools in Iraq, Hance, in this study, a web-based homework system developed (TPS teacher-parent-student)the system is coded in PHP programming language, Mysql is used as database.

1.2. Compare the Paper-Pencil Homework And The Online Homework

Information and communication technologies play an important role in our lives. In order to prepare the students for the future, the educational institutions should use them both for themselves and for their students[22].(Yasir Chaudhry and Malik 2014) argued that although technology is not a solution that can overcome all the educational problems, today, technology has become a necessary tool to be used in teaching processes[23]. In the knowledge society, both teachers (teaching staff and teachers) are able to make use of information technologies while evaluating and assigning homework and preparing students' homework, as a necessity.In the coming years, it is expected that the teachers will transfer their knowledge, test, homework, collection and evaluation tasks to information technology; it is possible to say that they will carry out the tasks of guidance and be motivating the students [24]. Many studies comparing the paper-pencil homework and the online homework indicate that the effect of the online homework is higher.

According to Johnson and McKenzie, the microeconomics course also showed that online homework significantly increased test scores and contributed to students' test scores using the tools in the program[25].

According to Gutarts and Bains, two components of homework motivation and feedback are strong indicators of academic achievement and performance of students. In general, the motivation of students with online assignments increases and instantly grades and online feedback is provided, although their work is related to homework that does not require the use of computers, [26],[27]. There are many works in the literature that compare traditional homework and online homework. (Cutshall and Bland) found that online homework contributed to sixty percent of the students in the finance entry course.However, 32% of these students prefer paper-based assignments instead of online homework [28].

According to Cutshall, Bland, and Mollick, students who have not graduated from college throughout the course of business statistics value Web-based homework, which provides immediate feedback on any homework problem [29].Online homework and feedback are necessary for the students to understand more easily."Immediate feedback" is seen by Gutarts and Bains as one of the important factors described above.

Mendicino, Razzaq, and Heffernan compared learning methods to grade 5 students in a mathematics classroom, and as a result, they found that learners learned better on feedback

during online assignments than on traditional paper-pencil assignments[30]. Contrary to the studies mentioned above.

According to Palocsay and Stevens, when the paper-papers homework is compared with the online homework, the effects on the success of the student do not show much difference[31]. It has been found effective to do online homework in various sciences[32].Teachers who can develop their own online homework management system (LMS) demonstrate the persistence of feedback with feedback[33],[34]. The same effect is stated in the introduction to chemistry. The more the students do homework online, the better the performance of the exam[35].

1.3.Advantage of Web-Based Homework System

The useful aspects of web-based homework system can be summarized as follows[36]:

- The Pedagogical Approaches: The usage of automated submission and the grading of homework, can enable and help instructors with the needed information with more frequent homework and with more questions on each homework that was never possible with the old traditional methods and approaches, therefore which increases the time spent by students in the study materials, answering questions, and solving problems: Any computer can control the process through which the tasks if desired, through some needs, to create a better-prepared student's progress that will be more efficient and productive while gradually choosing things approach to students less ability. Using Web-based assessment, with similar questioning techniques can easily be managed even if they are a large number of students.Even when the homework are more for self-evaluation and practice than for formal or general testing, records can be made of time on task and successfully connected to the course. Reports from the findings of this information to future students can make using the web-based homework more enjoyable and attractive.
- Reducing managementarial effort: Increasing students' time duration on task and continually managing homework became possible by automatic grading. This is when the server takes full control of the boring grade of the papers, which are often challenges with more assignments or quizzes. It saves time grades for the instructor (or hired

graders) and also improve the quality of class time used in recitations of problem solving.

- Automated evaluation also allows the instructor to perform item analysis to determine and ascertain which questions will best predict and visualize the students performance. With this: Instructors can then fit their assignments whether homework, quizzes, or exams, to include questions that are best for checking and verifying the student's level of learning and understanding.

- Timly instantaneous feedbacks: With computer-supported assessment, students can get immediate feedback on progress and performances. Surveys and questionnaires provided to students show and reveals that instant feedback is one of the most appreciated and cherished aspects of web-based assessment. Due to this fact, it is relevant to provide tasks with immediatet feedback and assignments with delayed feedback. The former type motivates students to consider and re-evaluate why they missed certain questions and the latter guarantees that students fully consider their answers and choices before submitting them in a retake or future exams.

1.4 Significance of Study

The Web-based homework systems are used in many countries like: The United States of America, Malaysia, England, and most countries in Europe, but currently, there are no school management programs in Iraq schools. However, homework monitoring is an important element in the academic achievement of students. For that, it can be said it is necessary to develop a web-based homework system.This system, which will provide a fairer rewarding of the achievements of students during the measurement and evaluation phase with monitoring the academic performance of the students, is the first in the Iraqi education system.

1.5 Aim of study

The aim of the study, Web-based homework system (TPS Teacher Parents Student) system produce for Iraq schools, teachers can give homework, control them, receive reports about performances and students and parents can monitor homework.The following pages will explain TPS system in detail.

Teacher in TPS system

- Can create exams.

- Can see the exams he/she has created.

- Can edit exams he/she has created.

- Can see reports of exams.

- Can create homework.

- Can see the homework created.

- Can edit the created homework.

- Can see the reports of assignments.

- Can choose lessons he/she has given.

- Can edit the profile.

- Can chat with students.

- Can exit the system.

Student in TPS system

- Can enter the exams created.

- Can see the results of the exam.

- Can upload homework.

- Can see the homework results.

- Can edit the profile.

- Can chat with the teacher.

Parents in TPS system

- Can see the exam results of his / her student.

- Can see the homework results of his / her student.

To build TPS system application:

- Setting up Xampp virtual server to work on server.

- Design the application using HTML,CSS,JAVASRIPT.

- Bootstrap used as web framework.

- The planned software part used PHP programming language.

- SUBLIME TEXT editor selection for the code.

- Database created in MYSQL as server

1.6.Related Research

Below are examples from web-based systems used in various countries.

Examples of school management system in America. Below is a description of the school management systems that include the components of monitoring homework.

Skyward: This is used in approximately 25 states. It is a school management system that works online. This system consists of modules that include giving and controlling assignments and controlling, observing disciplinary situations of students, following lesson plans, entering and observing student grades, getting student reports, making student and parental entries possible, and accessing the curriculum [37](Figur1).

Figure 1.Skyward School Management System Home Page[37]

HarmonyPublic Schools: A school management system that uses records, school management, messaging and discipline processes in nearly 40 schools in the state of Texas.This system : consists of modules for student registration and payment information, assignment and control,instant polling,sending messages about pupils, observing disciplinary situations of pupils, the preparation of lesson plans, school news, school activity calendar, test center,

allowing students to enter and view student grades, entering and printing student notes, making student and parental entries available, and accessing the curriculum [38](Figure2).

Figure 2.Harmony Publıc Schools Management [38]

AchieveTechnology: This is used in Texas. It is a school management system that works online. This system; consists of modules for student registration and payment information, instant polling, following disciplinary situations of students, making lesson plans, making plans of after school activities, printing student reports[39](Figure3).

Figure 3.Achieve Technology Home Page [39]

SycamoreEducation: Used in Nebraska. It is a school management system that works online. This system; consists of modules for student enrollment and payment information, assignment and control, instant polling, sending messages about parents, following disciplinary situations, making of course plans, school news, school activity calendar, test center, allowing students to enter and view student grades, entering and printing student reports, making student and parental entries available, and accessing the curriculum[40](Figure4).

Figure 4.Sycamores School Management System [40]

In addition to the examples above, there are web-based systems that do not follow the homework in the US but stand out from the managerial standpoint. These are;

K12 Online: It is a system that is used in junior high and high school level in the state of California and enables enrollment, school management and messaging online.This system consists of modules that include students' registration and financial reporting as well as all student reporting procedures[41](Figure5).

Figure 5.K12 Online School Management System [41].

Fable Technologies: This is used in schools in America, India and Australia. It is a school management system that works online.This system consists of modules that include student registration and payment information, student profiles kept online, administration of exam scores, fingerprinting, and student and parental entries[42](Figure6).
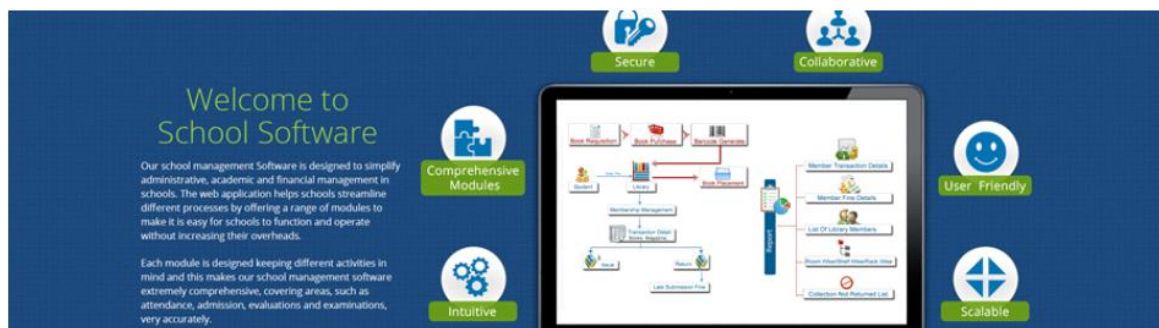

Figure 6.Fable Technologies School Management System [42].

Examples of school management system in England. Below is a description of the school management systems that include the components of homework monitoring[43].

Information Management For Schools (WCBS): This is used in almost all of the UK and about 30 countries around the globe. It is a school management system that works online.This system; consisrs of modules that include student attendance and payment information, student performance follow-up, integrated e-mail system, assigning and checking of assignments, instant surveillance, sending messages about parents and children, following disciplinary situations of students, making lesson plans, school news, center, allowing students to enter and view student grades, entering and printing student reports, making student and parental entries available, and accessing the curriculum. It also allows different countries to use it in their own language[44](Figure7).
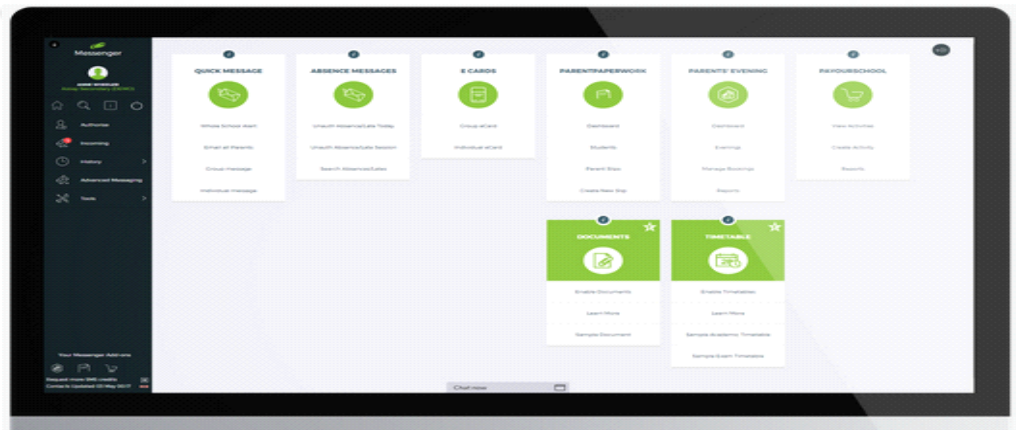

Figure 7.GroupCall Messenger [50].

School Information Management System (SIMS): A school management system developed in the UK and used in schools in the UK. This system; consistss of modules that include student attendance and payment information, student performance follow-up,assigning and checking of assignments, instant surveillance, sending messages about parents and children, making lesson plans,entering and printing school news, school activity calendar and student reports, student and parental entries available, and accessing the curriculum[45]**.**

Examples of school management systems from other countries. Below is a description of the school management systems that include the components of homework monitoring.

EduswiftNextGeneration School Management System: Developed in India. Online school management system used in many countries of the world. This system; consists of modules that include student attendance and payment information, assigning and checking of assignments, instant surveillance, student and parental entries available,making lesson plans, entering and

printing school news, school activity calendar and student reports and management of library[46].

Skoolbag: School management system developed in India and used in many schools of the same country. This system; consists of modules that include student attendance and payment information, sending messages, monitoring student notes, assigning and checking of assignments, sending messages to parenrs about students,time management, school news, school activity calendar, student and parental entries [47]

In addition to the examples above, there are web based systems that do not follow the homework but stand out from the managerial standpoint. These are;

Figure 8.Schoolbag School Management System [47]

Skoolbag is one of Australia's most trusted school apps, empowering schools to engage parents through a simple and central communication platform. The easy-to-use desktop and mobile app streamlines all aspects of organising school life, from newsletters and events to student attendance and documentation(Figure8).

Class master The Ultimate School Software: Developed in Czech Republic and prepared in 11 languages and used in many European countries. It is a school management system that works online. This system; consists of modules that include student attendance and payment information the storage of academic, financial and personal information of students, the recording of teachers' teaching materials, the ability to bring back this information and contact their students[48].

The Bing Software: Developed in Germany and used in schools in Europe, America, Costa Rica, Ecuador and Mexico. It is a school management system that works online. This system;

consists of modules that include student attendance and payment information, instant surveillance,and the creation of layouts[49].

1.7.Related Aplication

Skyward

- Web Framework: ASP.NET
- Web Server: IIS 7.5

HarmonyPublic Schools

- Web Framework:ZURB Foundation
- Web Server: Nginx
- JavaScript Framework: Modernizr , JQuery, Moment.js

AchieveTechnology

- Web Server: Nginx
- JavaScript Framework: Backbone.js, Modernizr, JQuery, Underscore.js

SycamoreEducation

- Web Server: Nginx
- JavaScript Framework: JQuery
- Php
- Web Framework: Twitter Bootstrap

K12 Online

- Web Server: Apache Tomcat
- JavaScript Framework: RequireJS
- Java

Fable Technologies

- Web Server: Nginx
- JavaScript Framework: Hammer.js

Information Management For Schools (WCBS)

- Web Framework : ASP.NET
- Web Server: IIS 7.5

School Information Management System (SIMS)

- Web Server: IIS 8.5
- PHP
- JavaScript Framework: JQuery

- Web Framework: ASP.NET

EduswiftNextGeneration School Management System

- DreamWeaver
- Web Server: IIS 7.5
- Web Framework: ASP.NET

Skoolbag

- Web Server: IIS 8.0
- PHP
- Web Framework: ASP.NET

Class master The Ultimate School Software

- Web Server: Nginx
- Ruby
- Web Framework: Ruby on Rails
- JavaScript Framework: JQuery

The Bing Software

- Web Server: Nginx
- CMS: Joomla
- PHP
- JavaScript Framework: JQuery, Lightbox, Modernizr, MooTools, Slimbox

CHAPTER TWO

2.1. Overview Web Development

When searching for web development functions, anyone can find a wide range of requirement. Language ,frameworks, and methodologies may vary widely,but there are two parts of web development that will be common to all jobs: frontend development and backend development.

2.1.1. Frontend Development

The frontend of an application is distinctly human. It is what the user sees, touches and experiences(also called client side development). The frontend of an application is less about the code and more about how the user interprets the interface to the experience.

2.1.2. Backend Dvelopment

The backend of the web application is an enabler for the frontend experience (also called server sid). The backend of the application is responsible for issues like calculations,business logic, database interactions and performance. Most of the code required to make the application work will be performed on the backend. The backend code is run on the server, opposed of the client. This means that the backend developers not only need to understand the programming language and database, but must also have an understand of the server architecture as well. If the application is slow, crashes, or canstantly casts errors at users, it is likely due to backend problems.

2.2. Technology Required for Frontend and Backend

2.2.1. JavaScript
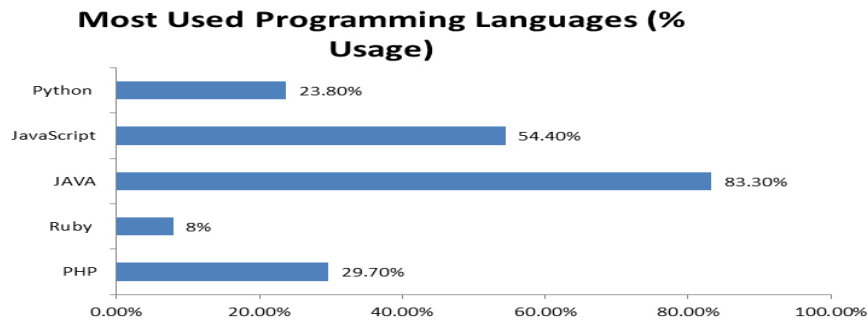

Figure 9.Javascript Programming Languge[56]

JavaScript is a dynamic programming language that is commonly used in web browsers (Figure 9). Client-side scripts written in JavaScript provide functions such as interacting with the browser, controlling the browser, communicating with the server in an asynchronous manner, and changing the content of the web page. JavaScript is also widely used on the server side through platforms like Node.js [51].

As a result, Javascript is a snippet of code that can be embedded in HTML code. Beside this, you can also write JavaScript code, which is a single extension .js extension. Since these codes are supported by all browsers such as Internet Explorer, Firefox, Opera, etc., they work fine [52].

2.2.2. JavaScript Libraries

Bellow som familiar JS libraries

- Underscore.js: Underscore.js is a library developed to make functional programming more flexible in JavaScript. It contents very useful listing, query, object and tools based on functions. It has over 200 functions that support both favorite functional helpers, invoke, filter, map, — as well as more specialized goodies: javascript templating, function binding, creating quick indexes, deep equality testing, and so on. Developers of Underscore.js are also developers at Backbone.js. Both projects are a DocumentCloud project. So, to use Backbone.js you have to include the Underscore.js [53], [54].

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- Moment.js: It is a open-code JavaScript library and lets us get out of date events. It is used to do complex parsing, validation and displaying of dates

- Lodash:It is a popular utility library written for JavaScript.array, You can easily do iteration and manipulation for arrays, objects and strings.

- Backbone.js: It is a JavaScript library that puts your cluttered JavaScript code into a structure and provides an enjoyable environment for development. Backbone manages the Model and UI components in particular, and provides special methods for communicating with RESTful services.

- D3.js: D3.js (or D3) is an open source, Javascript library that can display numerical data in accordance with web browsers. D3.js, which visualizes data using SVG, HTML5 and CSS components, is being developed as a continuation of the Protovis framework.

- ReactJS: It is a UI library developed on Facebook to facilitate the creation of interactive, stateful and reusable UI components. It is used on Facebook and Instagram.com is completely written with ReactJS.

- jQuery UI:(jQuery User Interface) is a JavaScript library built on jQuery. It is design-intensive, and used to add functionality and visualization to HTML elements. The most known and used features are drag and drop, resize, auto complete, progressbar.

- JQuery Mobile: Iı is an optimized framework for touch screens that supports all popular mobile devices. JQuery Mobile, which uses JQuery and JQuery UI frameworks, is using the HTML5 parent structure as its user interface. So JQuery libraries are used with CSS and HTML5 technologies.

2.2.3. Front-End Frameworks

Figure 10.Front-End Frameworks [57]

The front-end framework is a framework of applications with a large library of functions and classes that make up the skeleton of the software (Figure 10). It is the programmer who encodes

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the front side of a website. It is usually one that allows the design file to become a web site using HTML, JavaScript (JS) and / or CSS code (Web technologies) [55].

- Bootstrap-Bootstrap is the most popular HTML, CSS and JavaScript framework used to develop sensitive and mobile priority websites. With responsive support, it allows you to build a responsive site in your own environment without printing almost any extra code.

- Semantic UI- The Semantic UI is a Bootstrap alternative to interface and design of websites. The Semantic UI continues to be developed to make web sites more semantics. The coding is much more readable and understandable because it uses natural language principles.

- Uikit– With functionality and quality, Uikit offers easy-to-use, customizable components.

- Foundation – It is a professional framework with a very strong structure. With Foundation, responsive designs can be made easier. The most commonly used feature is the grid, which is responsive.

2.2.4. Frameworks for Web Application

Figure 11.Frameworks for Web Application[57]

Web application framework is a software that is building to support the development of web application. There is list of web application as shown in(Figure 11).

- Ruby: It is on rails is a web-application *framework* that includes everything needed to create database-backed web applications according to the Model-View-Controller (MVC) pattern.

- Express **:** It is module is a template framework written for Node.js. Due to its structure and useful methods, it makes our work very easy.

- Meteor **:** It is a full-scale reactive application framework for creating mobile, desktop and web applications with JavaScript. This MIT Licensed Open Source JavaScript

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framework uses an integrated JavaScript stack that extends from the database to the client-side code.

- Django **:** It is an open source web framework with Python programming language. It distinguishes itself from other server software and new interface coding methods with detailed error report pages, simple installation and use.

- ASP.net: It is a web application development framework. It was developed with significant improvements over the classic ASP developed by Microsoft. Asp.net is a modern technology and allows the creation of web pages, web applications and XML web services.

- CakePHP: It is a framework that makes PHP coding in a fast and easy way. It works with the MVC logic.

- Flask: It is a very powerful framework that you can work with python and a minimal framework that is easy to learn

- CodeIgniter: It is a framework that uses MVC (Model-View-Controller) structure. Thanks to Codeigniter, the codes you have written are both clearer and easier to use in other applications.

- AngularJS: It is one of the most used JavaScript frameworks for creating web applications and SPA (single page applications).

- Ember.js: It is a thoughtful JavaScript framework that is easy to learn and has good community support.

2.2.5. Programming Languages

Figure 12.Programming Languages[58]

All application and system software, whether general or special purpose, are written in programming languages (Figure 12). A programming language is a group of symbols, characters, and rules that allow people to perform various operations on a computer. Programming languages work as interpreters between people and computers. Programming languages include statements and commands that specify what, when, and how to do it with a computer.

Professional web design process is established by html and css programs and it is to link databases with keys with programs such as php, asp, java, cgi, aspx, etc. in order to make live dynamic on it. These are;

- PHP: (Hypertext Preprocessor) is a easy-to-learn tutorial that can be embedded into HTML designed to develop virtual programs.
- HTML5: HTML (Hyper Text Markup Language) is a scripting language used to create web pages. Files can be stored on a host computer's storage and displayed on the site. HTML5 is the update made to HTML from HTML4 (XHTML follows a different version numbering scheme). It uses the same basic rules as HTML4, but adds some new tags and attributes which allow for better semantics and for dynamic elements that are activated using JavaScript.
- Python: It is an object-oriented, interpretive, modular and interactive high-level programming language.
- Ruby: It is an open source object-oriented programming language. One of the elements that emphasize the Python language is its use in scientific methods and very fast processing.
- Scala: It is a programming language that includes both object-oriented and functional programming methodologies. Although Scala is its own compiler, it can produce Java Byte-Code, so you can run it on the JVM.
- CSS3: The extension of CSS is Cascading Style Sheets, which is used to make HTML codes more visually rich. CSS3 is the third and final version developed over previous versions of CSS. Another feature that comes with CSS3 is font-face technology.
- SQL: It means "Structured Query Language" in English. Despite the fact that it is not a programming language, it is often known as a programming language. It is used for adding and subtracting records by using unique cues to database.

- Golang**:** Developed as open source, it is a software language that can be compiled to improve simple, reliable and efficient applications by taking the good parts and leaving behind the wrong parts of languages like Python, C.

- Rust**:**It is a multi-paradigmprogramming language that supports functional,object-oriented , imperative and concurrent-action programming styles. It has emerged with more security motives and control of Mozilla developers.

- Elixir**:** It is functional, concurrent, general purpose language that Works on Erlang virtual machine. Since it is a language based on Erlang, it can share the same abstract approaches as Erlang while writing distributed, fault tolerant systems.

- NodeJS**:** It is a platform designed to develop scalable applications using the event-driven, nonblocking I / O model running on the V8 JavaScript engine, as well as running on the Chrome web browser.

- JavaScript**:** It is a modern, highly user-friendly programming language designed entirely with objects.

2.2.6. Databases
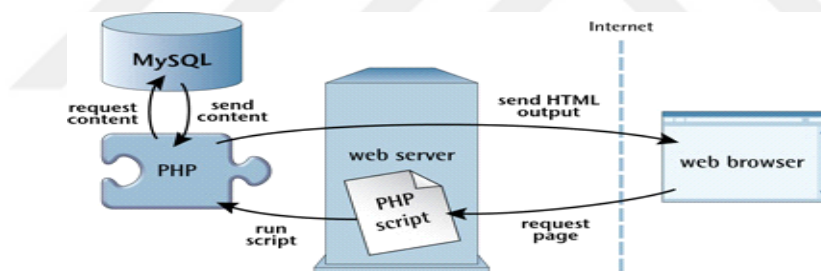
Figure 13.Databases[59]

It is the name given to the software that stores the data systematically. Many software can store information, but the difference is that the database can efficiently organize this information and get it quickly. It is essential to have access to information when necessary (Figure 13). Information that is not organized in the database can be likened to a library that does not have a catalog. They are programs where the possibilities are provided, information can be kept in integrity, and multiple users can access the same information at the same time.

- MariaDB: It is a community-maintained relational database (RDBMS) server derived from the MySQL database server's source code, distributed and freely available under

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the GNU General Public License. It recognizes MySQL commands and supports MySQL interface methods.

- MongoDB : It is one of the most popular NoSQL solutions on the market today. MongoDB is an open source, document-oriented database designed for ease of development and scalability. The documents are stored in MongoDB in JSON-like Binary JSON (BSN) format.

- Redis: It is an open source key-value repository. It is a server that keeps data as strings, hash, list, set and ordered list, and allows to use various data structures. In Redis, the data is stored in memory, but the data can be written in discrete (file) at desired intervals. By providing memory as well as data diskette, it provides a more consistent and continuous database.

- PostgreSQL: It is an open source, free, relational database management system that conforms to sql standards. It works on almost all Unix-derived operating systems and Windows NT-core systems. PostgreSQL is well-behaved, advanced in security and features. PostgreSQL Postgres was created with the development of DBMS. Supports rich data types (Array, JSON, integer, boolean, etc ..)

- MySQL: It is an open source database software developed by Sun Microsystems. MySQL is a multi-user SQL database management system (DBMS). At present, it is one of the most used database management systems in the world. MySQL is a popular software for web applications and it works as a database component for Linux (LAMP), BSD (BAMP), Mac (MAMP), Windows (WAMP) systems

2.2.7. CSS Preprocessors

Figure 14.CSS Preprocessors[60]

CSS preprocessors have brought solutions that add dynamism to the static world of CSS. It is possible to do a lot of typing with CSS preprocessors that is not in CSS and does not seem to be available in the near future (Figure 14).

The CSS preprocessors are still an intermediate compiler with CSS. The only preprocessors that allow you to use a language structure that is shorter and easier to develop are the CSS again, so your use of them does not bring you any disadvantages like browser incompatibility.

- LESS- It is a tool that will make your CSS writing faster, simpler and more convenient. With LESS we can define variables, create mixins, use defined functions, and do mathematical calculations.

- SaaS - Software as a service (SaaS) allows users to connect to cloud-based applications over the Internet and use them over the Internet. Email, calendar and office tools (eg Microsoft Office 365) are examples of these applications.

- Stylus -Not only does Stylus support all the features from Less and Sass, it provides features not found anywhere else. One of Stylus' distinguishing features is transparent mixins: reusable, possibly dynamic styles that look exactly like native CSS properties. Stylus has a more free spelling style than SASS and LESS. In this case, Stylus, a Node.js application, came to the fore in response to SASS written in Ruby and LESS, a proprietary compiler.

2.3. Web Application Testing

Testing is an important part of the web application development process.Bellow are some of the most common testing needed for any web application development process

- Quality assurance and bug testing.

- Multiple browser compatibility.

- Application security.

- Performance.

- Usability.

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2.4. Localhost

2.4.1. What is localhost?

Localhost is the name given to the process of using that computer just like a server, thanks to the extra software installed on the computers. Particularly web software developers use localhosts to test their work on their own computers instead of on a real server. The work you do here is impossible to see and access as long as you do not share it with anyone else. This means that you can develop web software in a secure environment.

Localhost refers only to a personal computer limited service. How Webhost is open all over the world, it is open only to the user who is authorized on localhost. You can publish your internet site on Localhost. You can install Php and Mysql based scripts. If you are a developer, you can test scripts that you write. If you are a designer, you can see how your website looks.

2.4.2. How to create web server on localhost?

To create a web server, you need to install the following:

- Apache Webserver
- MYSQL
- PHP Engine
- PhpMyAdmin

The Apache web server is what runs your dynamic web site; If your website contains data records in your database, you will need MYSQL; The PHP Engine allows you to run PHP scripts on your web server; PhpMyAdmin interacts with MYSQL, so you can update your database records.

Localhost is closed on normal computers, so some programs need to be installed to get server properties in order to broadcast it. It is very easy to do this because the server operating systems are ready for it, but in end-user operating systems this is a bit tricky.

Below are the more accessible and popular variants of these packages and the operating systems they are designed for.

- WAMP (OS: Windows)
- XAMPP (OS: Multi-platform – Windows, Linux, Solaris, Mac)

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Wamp server is an installation package for Windows. It is a localhost program like Apache and xampp server. The difference from other programs is that there are Mysql, Apache, Php installations.

2.4.3. Xampp Server

In this study, Xampp server is used. Xampp is an apache distribution that allows developers to easily create a local web server for projects they are working on. Every word of Xampp, has a meaning. X: cross-platform, A: apache, M: mysql, P: php, and the last letter P stands for perl.

X: cross-platformmeans windows, mac and linux are running with almost identical performance on their operating requirements.

A: apache server: Apache is an open source, powerful, robust, capable and flexible http (web) server. Developed by the Apache Software Foundation (ASF). The ASF was created by Apache authors in 1999 to be a legal umbrella for software. It is an open source software,

M: MySQL: If you are developing a dynamic web application, then you need a database to hold your data. This is where the MySQL database comes in. MySQL is both open source and works well with php.

P: PHPMyAdmin: It is an open source tool written in PHP. We provide the administration of the MySQL database through this tool. We can create a new database or delete an existing database, edit tables, import files with .sql extensions, and run sql queries.

P: PERL: Although Perl is not a very popular language for web development, it is a powerful, high-level dynamic programming language that can be used extensively for text manipulation and image definition.

In addition to the components mentioned above, you can also use components like FileZilla FTP Server, Mercury Mail Server, Tomcat and Webalizer.

- FileZilla: FileZilla is used to connect to FTP servers. It provides fast, powerful and reliable file transfer between your computer and FTP servers. It can work with Windows, Linux and Mac OS X operating systems.

- FTP Server: FTP (File Transfer Protocol) is a file transfer protocol in which a file can be transmitted to a different computer. FTP servers can be configured so

that "anonymous FTP" file transfers can be made without entering any user information in order to use "when necessary" as required by the user name and password for file transfer.

- Mercury Mail Server: With Mercury Mail Server, you can see how we can successfully send mail from localhost.

- Tomcat: Apache is an application server, a subproject of open source Apache developed for Tomcat, Java Servlets and Java Server Pages (. JSP) technologies.

- Webalizer: Webalizer is a sophisticated statistical program that generates information about the navigator using the FTP protocol to access your FTP site. With this service help, you can view the statistics of users who enter ftp on daily, monthly and hourly basis.

2.4.4. What is the benefit of Xampp server with localhost?

Both servers have their equal importance but Xampp server has advantages over other servers: These are:

- The whole webserver+database stack can be started and stopped with one command.

- It can be carried is around on a thumb drive as it is portable.

- Only you will be able to access the web server as the security settings are strict by default.

- PHP error reporting is enabled by default, which helps in debugging your scripts.

- It is an open source software and you can easily download and install it on your local machine. With these advantages we can use Xampp server for testing work or updating work for our website.

CHAPTER THREE

METHODOLOGY

3. Introduction

Since many homework sites allow an entry for their own user group we have not been able to access to many sources to base our work. Therefore, the system is designed with the help of a group of teachers and according to the system is convenient and easy to use by the teacher and student.

In this chapter we will explain the design and programming of web pages for the TPS system.

For page design (front-end), Bootstrap was use as a framework. it contains JavaScript, HTML, CSS.

For (back-end), the programming process will be using PHP language and MySQL as a database.

3.1.Detailed of Flow Chart of The TPS

Detailed of flow chart of the TPS system is shown in figure15.
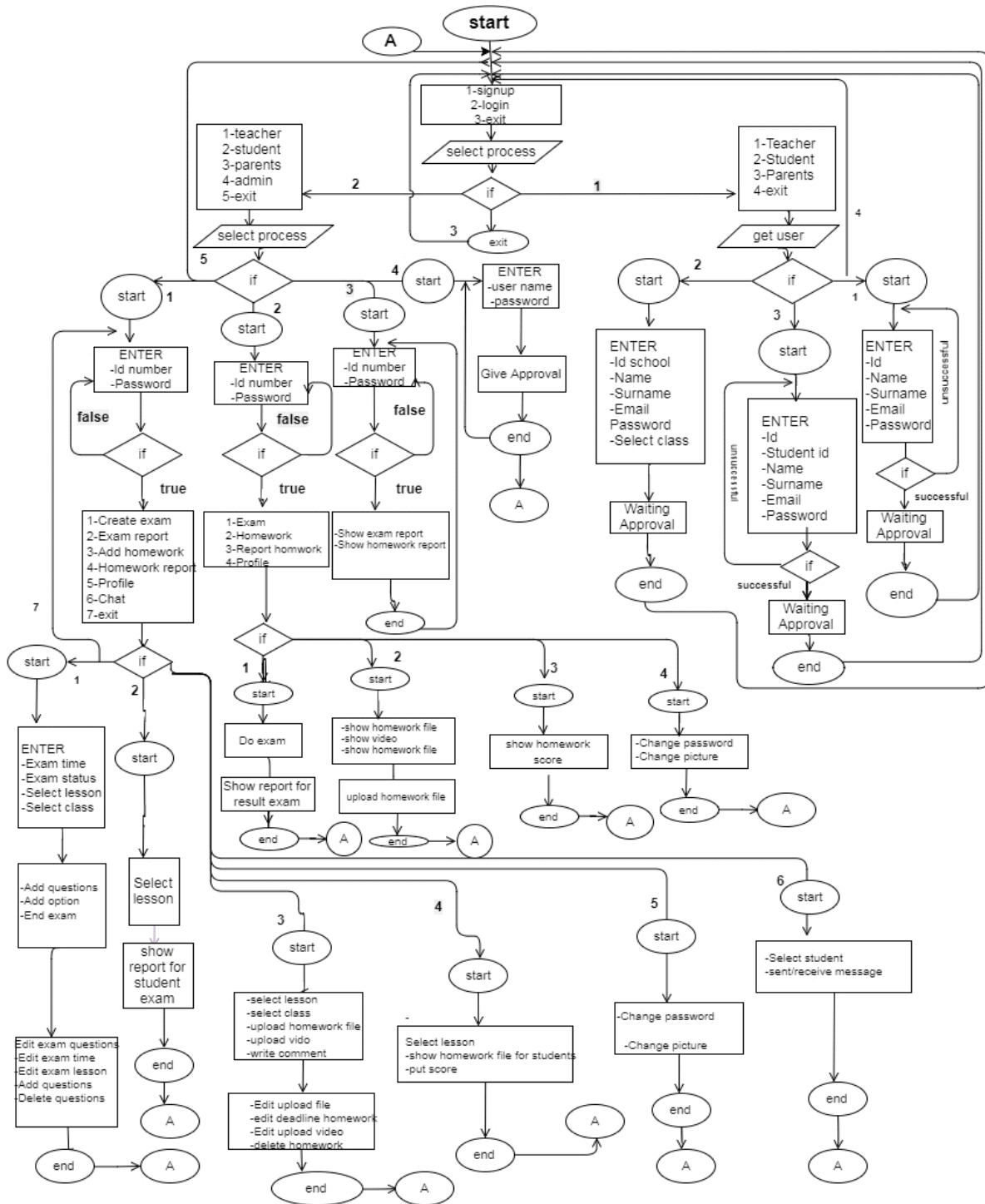
Figure 15.TPS system flow chart

3.2. Database Design

When designing the database, the draw.io online platform is used. The constituted ER diagram is as follows(Figure16).
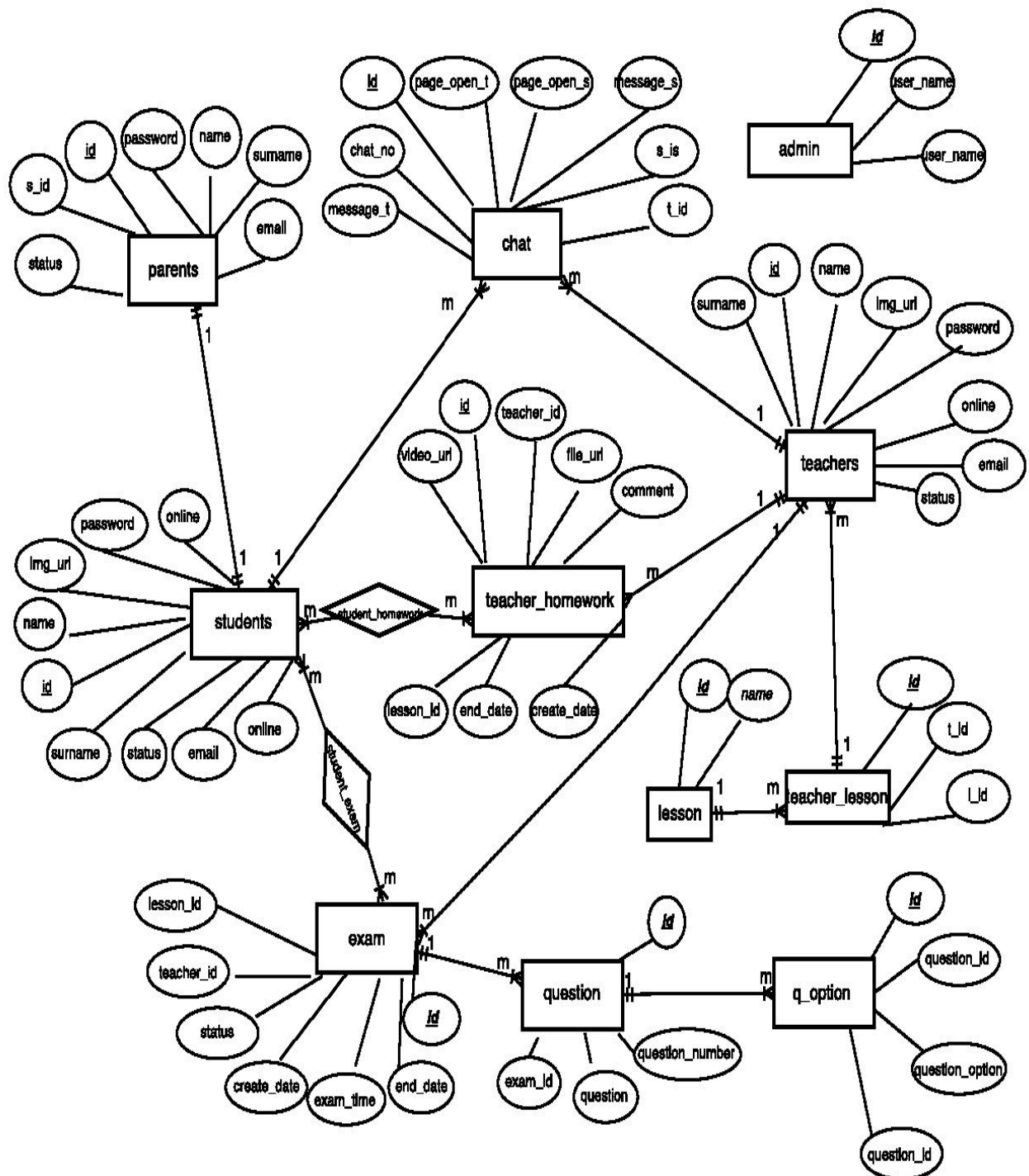
Figure 16.Database Design

The components of ER diagram

- **Table parents**

  This table is used to keep parent's information.

  Attributes of parents table:
    - The Id: It is an integer type and it is the primary key.

    - The S _id: It is an integer type and it is the secondary key reference to students table.

    - The Name: It keeps name of parents and it is type varchar.

    - The Surname: It keeps surname of parents and it is type varchar.

    - The Email: It keeps email addressand and it is type varchar .

    - The Password: It is a varchar type.

    - The Status: It is an integer type.

- **Table students**

  This table used to keep student's information.

  Attributes of students table:
    - S _id: It is an integer type and it is the primary key.

    - Name: It is a varchar type.

    - Surname: It is a varchar type.

    - Email: It is a varchar type.

    - Password It is a varchar type.

    - Img _url: It is a varchar type.

    - S _class: : It is a varchar type.

    - Status: It is an integer type.

    - Online: It is an integer type.

- **Table teachers**

  This table used to keep student's information.

  Attributes of teachers table:
  - Id: It is an integer type and is the primary key.

  - Name: It is a varchar type.

  - Surname: It is a varchar type.

  - Email: It is a varchar type.

  - Password It is a varchar type.

  - Img _ url: It is a varchar type.

  - Online: It is an integer type.

  - Status: It is an integer type.

- **Table chat**

  This table used to hold text messages of teachers and students

  Attributes of chat table:
  - Id: It is an integer type and is the primary key.

  - T_ id: It is an integer type and is secondary key reference to teachers table column(id).

  - S_ id: It is an integer type and is secondary key reference to students table column(s_id).

  - Message _s: It is an integer type.

  - Message_ t: It is an integer type.

  - Page_ open_ s: It is an integer type.

  - Page_ open_ t: It is an integer type.

  - Chat_ no: It is an integer type.

- **Table teacher_ homework**

  This table used to keep information of the teacher's homework

Attributes of teacher_ homework table

- Id: It is an integer type and is the primary key.

- Teacher_ id: It is an integer type and is secondary key reference to teachers table column(id).

- Lesson_ id: It is an integer type and is secondary key reference to lesson table column (id)

- Video_ url: It is a varchar type.

- File_ url: It is a varchar type.

- End _date: It is a date type.

- Create_ date: it is a date type.

- Comment: It is a varchar type.

- **Table teacher_lesson**

Attributes of teacher_lesson table

- Id: It is an integer type and is the primary key.

- T_id: It is an integer type and is secondary key reference to teachers table

- L_id: It is an integer type and is secondary key reference to lesson table

- **Table lessons**

This table used to keep information of the lesson

Attributes of lesson table:

- Id: It is an integer type and is the primary key.

- Name: It is a varchar type.

- **Exam table**

This table used to keep information of exam

Attributes of exam table:

- Id: It is an integer type and is the primary key.

- Lesson _id: It is an integer type and is secondary key reference to lesson table column(id).

- Teacher_ id: It is an integer type and is secondary key reference toteacher table column(id).

- Exam_ time: It is an integer type

- Create_ date: It is a date type.

- End_ date: It is a date type.

- Class: It is a varchar type.

- Status: It is an integer type.

- **Question table**

  This table used to keep information of questions
  - Id: It is an integer type and is the primary key.

  - Exam_ id: It is an integer type and secondary key reference to exam table column(id).

  - Question: It is a varchar type.

  - Question_ number: it is an integer type.

- **Q_ option table**

  This table used to keep information of the options for questions

  Attributes of q_ option:
  - Id: It is an integer type and it is the primary key.

  - Question_ id: It is an integer type and secondary key reference to question table column(id)

  - Question_ option: It is a varchar type.

  - Answer: It is an integer type.

- **Tables relationship**:

- Student_ homework: it is relationship between students and teacher_ homework table

  Attributes of student_homework table:

  - S_id: It is an integer type and it is primary key referece to students table colomun (s_id).

  - H_id: It is an integer type and it is primary key referece to teacher_homework table colomun(id).

  - Upload _date: It is date type.

  - File _url: It is varchar type.

  - Score : It is varchar type.

- Student _ exam: It is relationship between students and exam table.

- Attributes of student_exam table:

  - S_id: It is an integer type and it is primary key referece to students table colomun (s_id).

  - E_id: It is an integer type and it is primary key referece to exam table colomun(id).

  - Q_id: It is an integer type .

  - O_id: It is an integer type .

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3.3.Designing Web Pages

The design of the web pages is outlined in the form of storyboard below(Figure17) While web pages are encoded, this storyboard will be based on.
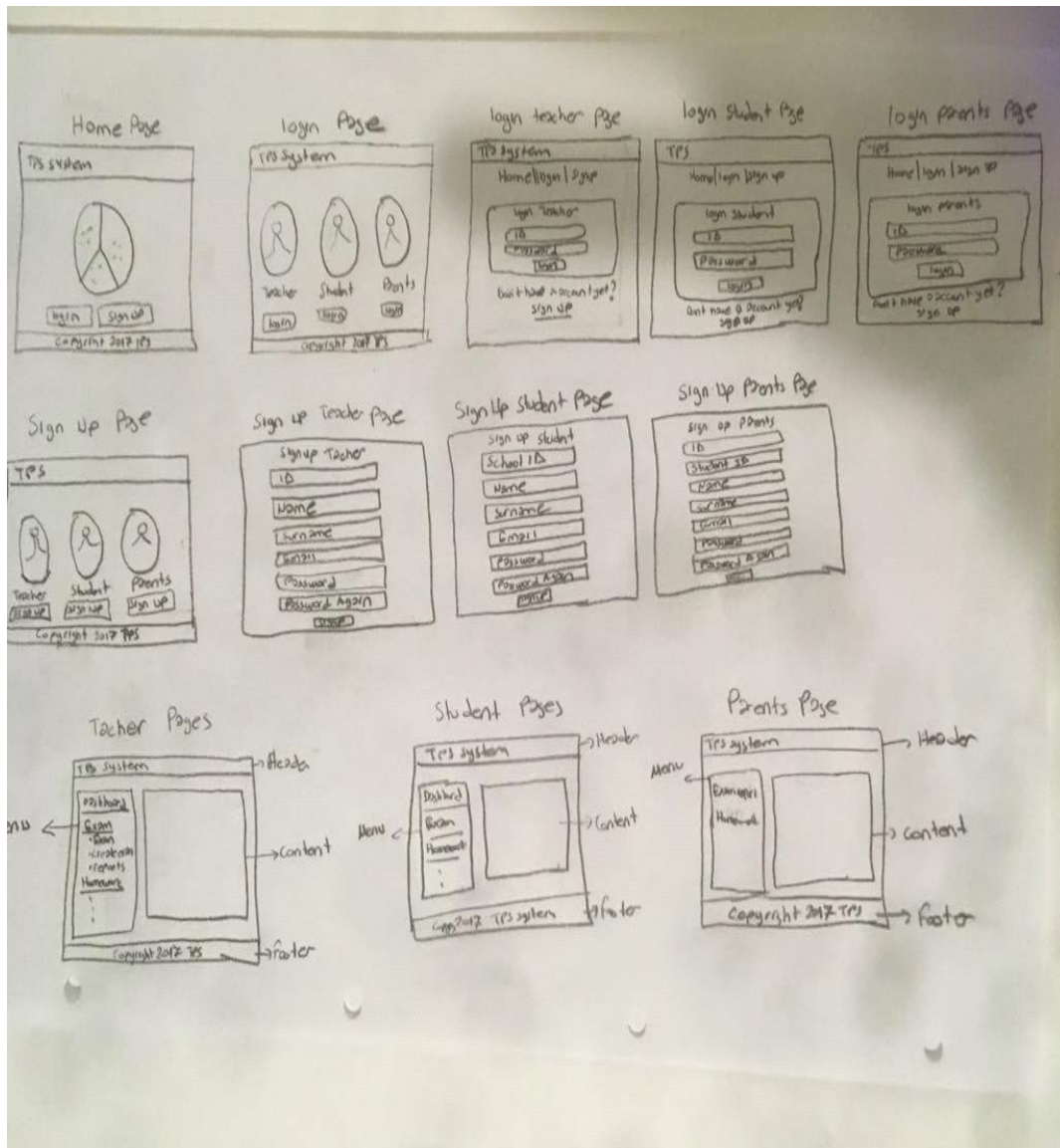
Figure 17.Designing Web Pages

3.4. Coding of Web Pages

3.4.1. General Pages

3.4.1.1.index.php

An infographic describing the system is added to the home page, in addition, two buttons have been added to the system so that it can be entered and registered with the system (Figure 18).
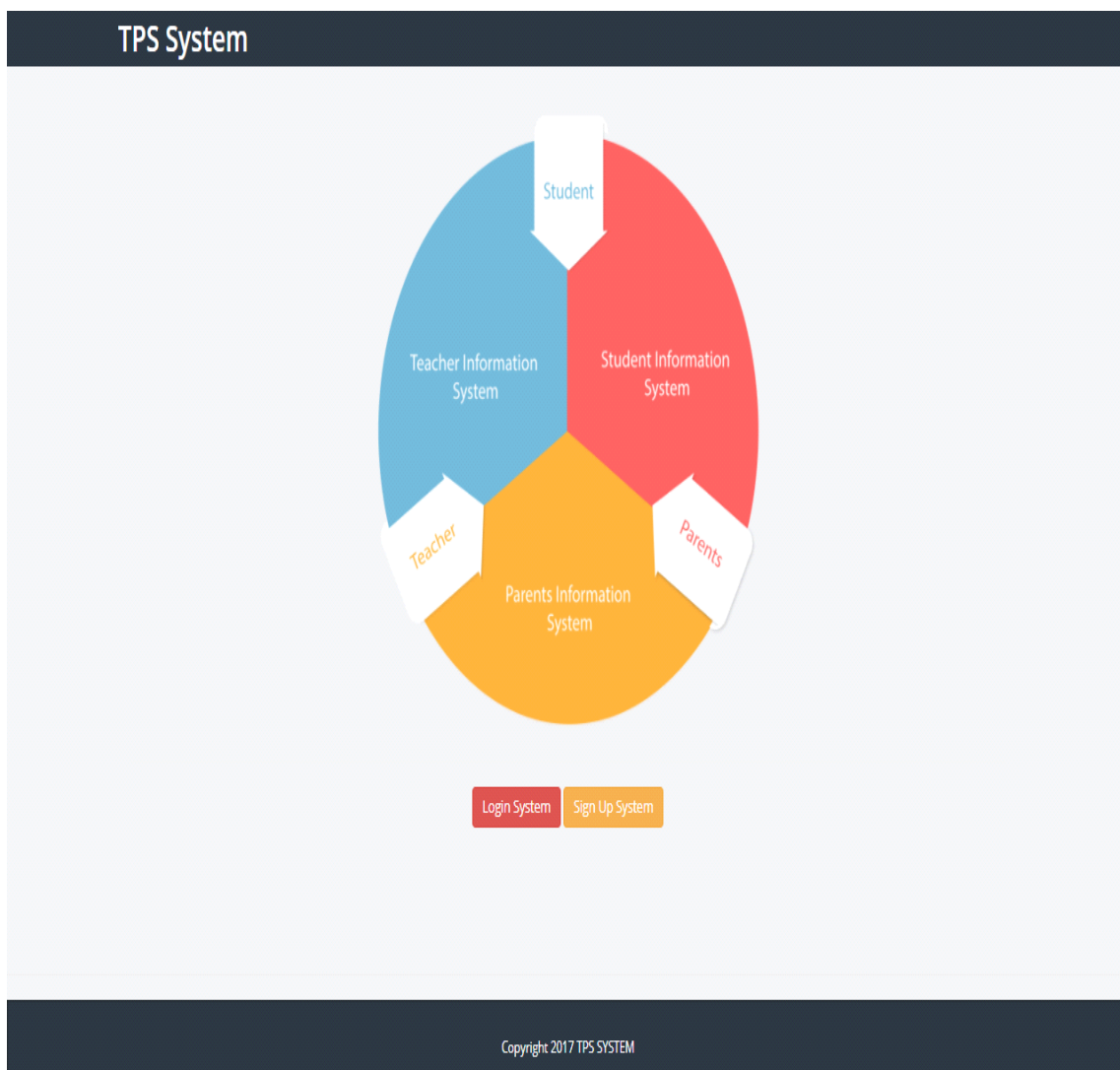
Figure 18.index.php
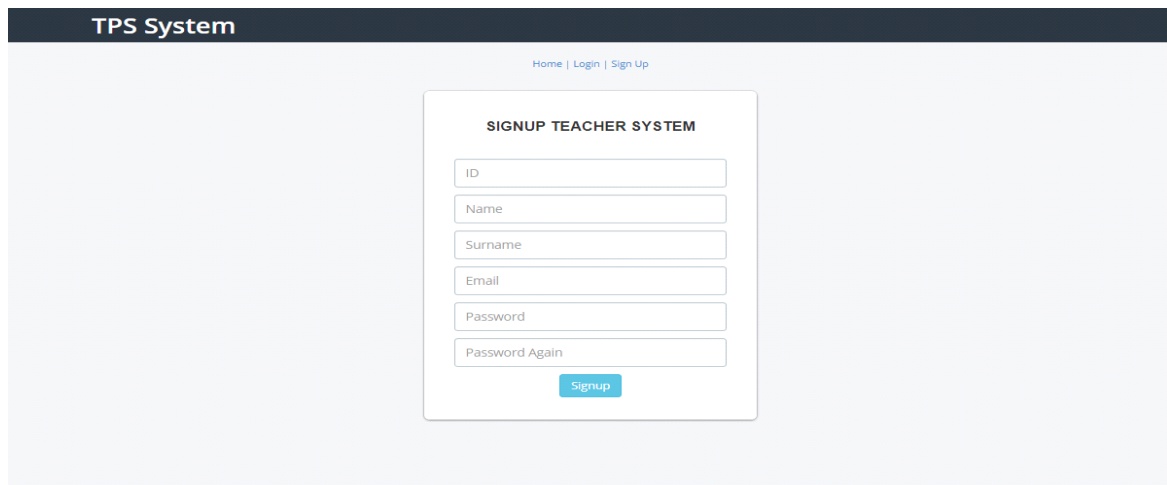
3.4.1.2.signup.php

In this page, 3 buttons are added to direct the pages required for teachers, students and parents to register with the system (Figure 19). The administrator gives approval to the persons authorized to enter the system for security reasons.

Figure 19.signup.php

3.4.1.3.Signup_teacher.php
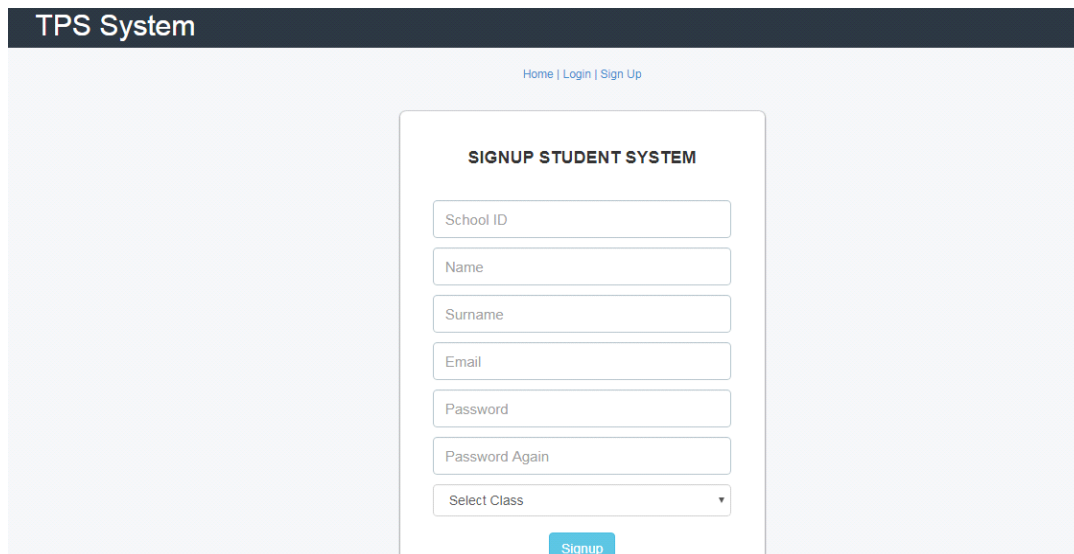
Figure 20.Signup_teacher.php

In this page(Figure 20); the data entered by the teacher is recorded in the "teachers" table in the database. If the teacher has already registered in the system, he\she cannot register again. If the e-mail address of the teacher has already been registered in the system, the teacher cannot register in the system. The password entered by the teacher is recorded in the database using the md5 encryption method. If the teacher does not enter the same password in the password fields, the system cannot register. If the teacher has successfully registered in the system, the teacher defines a standard profile photo and the photo's URL is saved in the database. When the teacher registers with the system, the status column in the database is automatically set to 0, indicating that the teacher is waiting for approval by the system administrator

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3.4.1.4.Signup_student.php
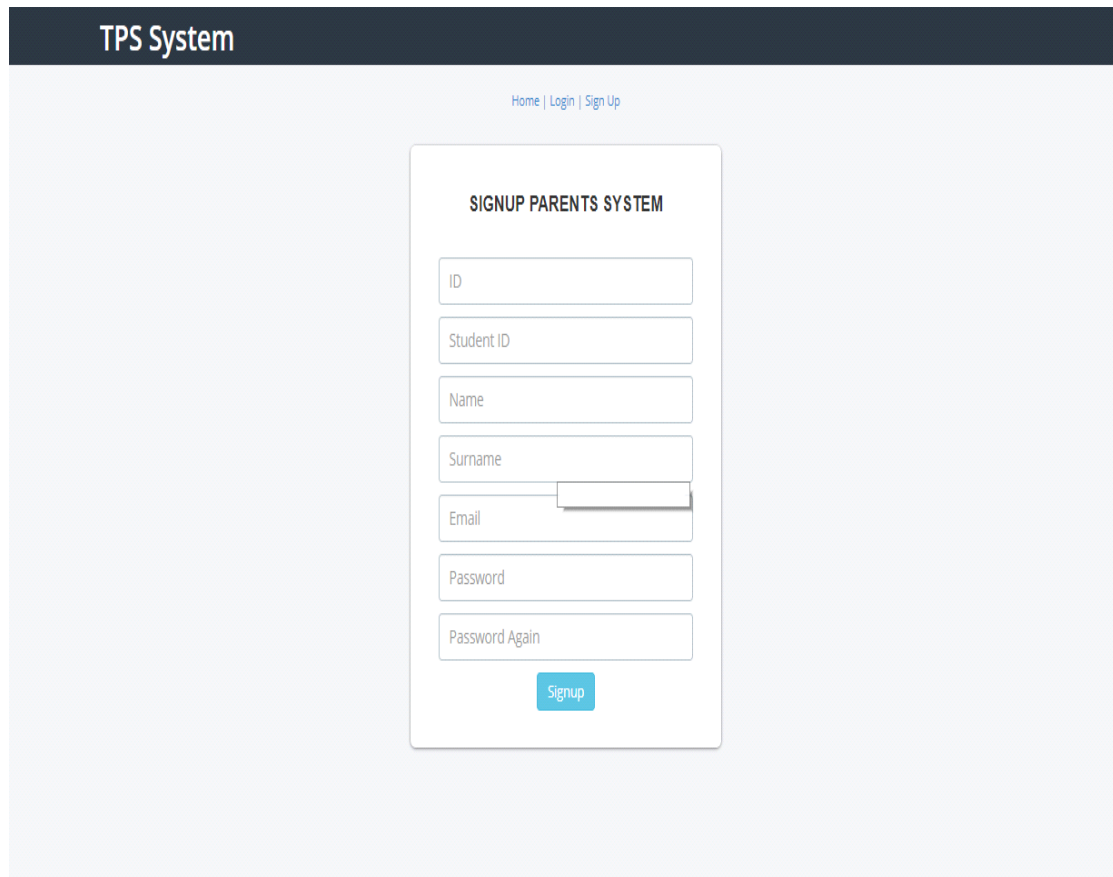
Figure 21.Signup_student.php

In this page (Figure 21); the data entered by the student is recorded in the "students" table in the database. If the student has already registered in the system, he\she cannot register in the system again. If the e-mail address of the student is already registered in the system, the student cannot register in the system. The password entered by the student is recorded in the database using the md5 encryption method. If the student does not enter the same password in their password fields, they cannot register in the system. In addition, the student is asked to select the class If the student is successfully registered in the system, the student will be identified with a standard profile photo and the photo's URL is saved in the database. When the student is enrolled in the system, the status column in the database is automatically set to 0, which indicates that the student is waiting for approval by the system administrator.

3.4.1.5.Signup_parents.php

In this page (Figure 22); the data entered by parent is recorded in the "parents" table in the database. If the parent has already registered in the system, he cannot register in the system again. If the e-mail address of the parent is already registered in the system, the parent cannot register in the system. The password entered by the parent is recorded in the database using the md5 encryption method. If the parent does not enter the same password in their password fields, they cannot register in the system. The ID of the student is required to be entered from the parent so that it is known which student belongs to the parent. When the parent registers with

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the system, the status column in the database is automatically set to 0, indicating that the parent is waiting for approval by the system administrator.

Figure 22.Signup_parents.php
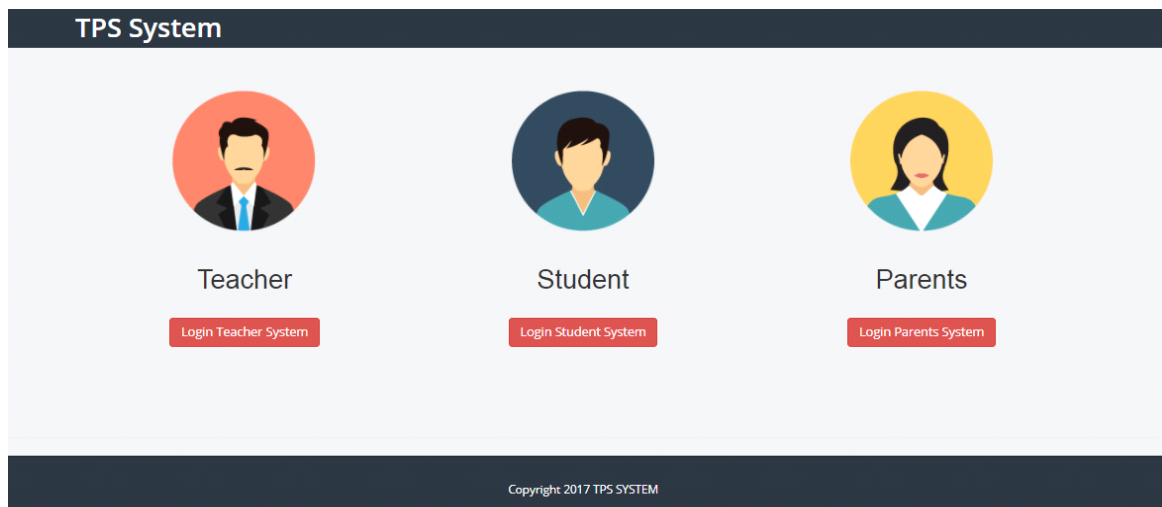
3.4.1.6.login.php

Figure 23.login.php

In this page (Figure 23); Buttons were created for directing the pages where teachers, students and parents would enter the system.

3.4.1.7.Login_teacher.php

In this page (Figure 24); It is checked whether the ID and password fields entered by the teacher match the data in the "teachers" table in the database. If the data matches, the teacher logs in to the system, the teacher is warned if the data is not matched. Also, if the "status" column of the "teachers" table in the database is not 1, the teacher can not log in to the system. The ID of the teacher who entered the system is also held in a Session.
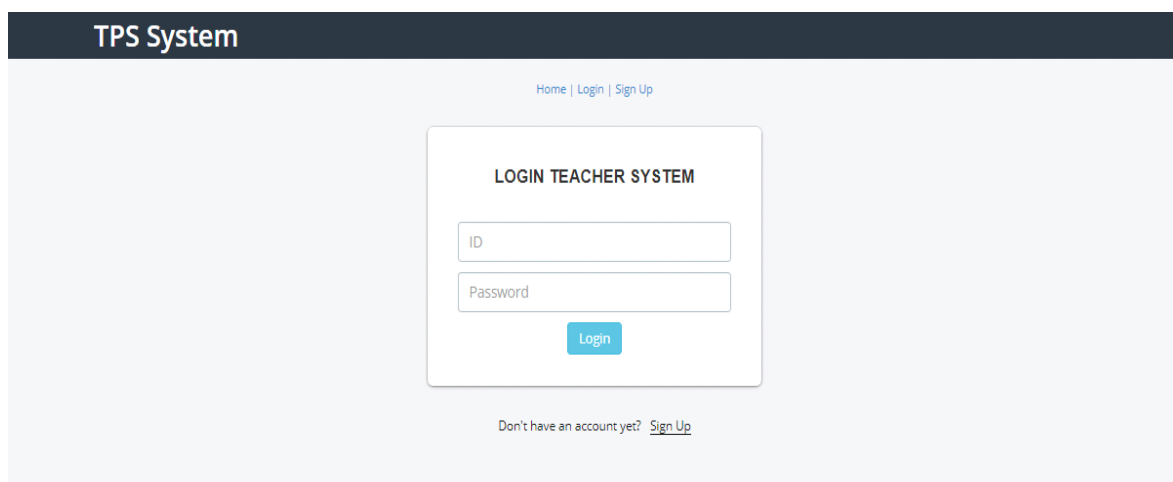
Figure 24.Login_teacher.php

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3.4.1.8.Login_student.php

In this page(Figure 25); It is checked whether the ID and password fields entered by the student match the data in the "students" table in the database. If the data matches, the student logs in, the student is warned if the data is not matched. Also, if the "status" column of the "students" table in the database is not 1, the student system cannot log in. The ID of the student who entered the system is also held in a Session.
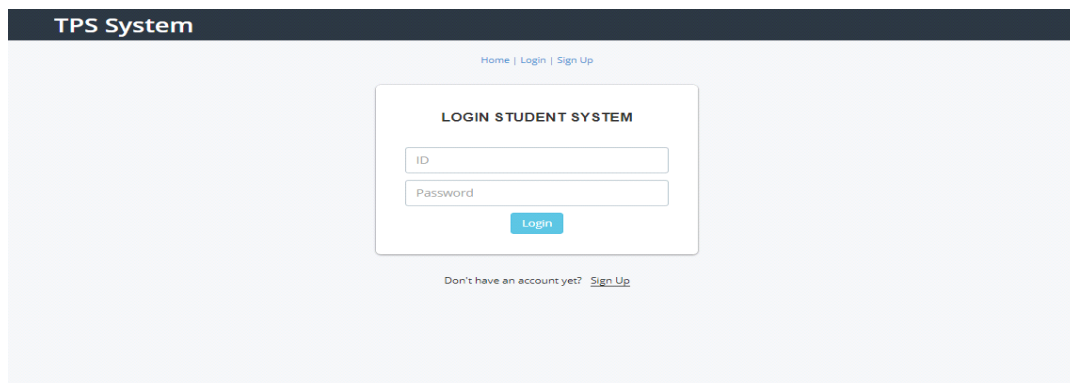
Figure 25.Login_student.php

3.4.1.9.Login_parents.php
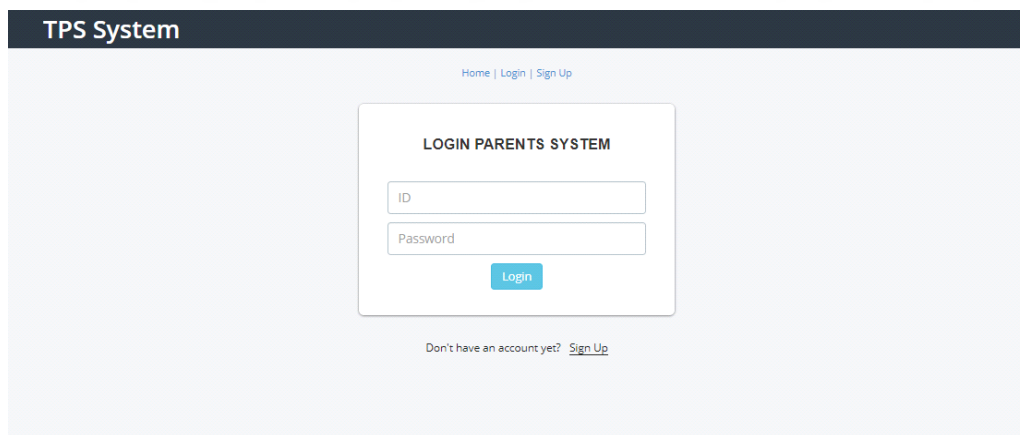
Figure 26.Login_parents.php

In this page(Figure 26); It is checked whether the ID and password fields entered by the parents match the data in the "parents" table in the database. If the data matches, the parents log in, the parents are warned if the data is not matched. Also, if the "parents" table in the data base does not have the value "1" in the "status" column, the parent system cannot log in. The ID of the parents who entered the system is also held in a Session.

3.5.Teacher System Pages

3.5.1. General features

Teacher in this system;

- Can create exams.

- Can see the exams he/she has created.

- Can edit exams he/she has created.

- Can see reports of exams.

- Can create homework.

- Can see the homework created.

- Can edit the created homework.

- Can see the reports of assignments.

- Can choose lessons he/she has given.

- Can edit the profile.

- Can chat with students.

- Can exit the system.

The menu items created in the system are as follows;

- Dashboard

- Exam

    - Exams

    - Create exam

    - Reports

- Homework

    - Homeworks

    - Add homework

    - Reports

- Lesson

- Profile

- Chat

- Logout

3.5.1.1.Teacher_home.php

In this page(Figure 27); icons and buttons were created so that the teacher could start a quick start, create exams, start a chat and go to the profile editing pages.
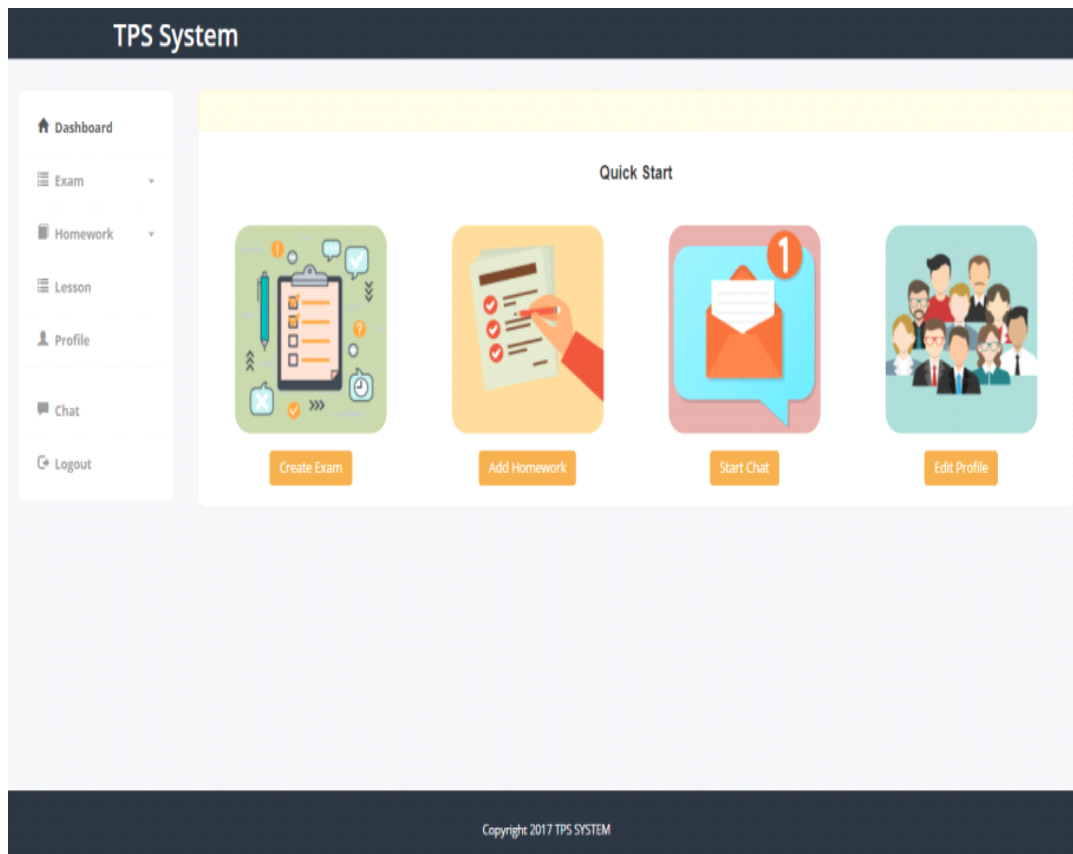
Figure 27.Teacher_home.php

3.5.1.2.Create_exam.php

Figure 28.Create_exam.php

In this page (Figure 28); the teacher determines in which lesson he/she will do the exam, the duration of the exam, the status of the exam, the date of the last participation in the exam and exam class to be opened. When the "Create Exam" button is clicked, the entered data is saved in the exam table in the database and the page is redirected to the page where the exam questions will be created.

3.5.1.3.Exam2.Php

In this page (Figure 29); the teacher enters the first exam question. When the "Create Question" button is clicked, the question and number of the question is saved in the "question" table in the database and the page is redirected to the page where the problem options will be created. When the "End Exam" button is clicked, the question creation page is exited, and the page is redirected to the "edit_exam.php" page where the exam details and the exams can be edited.

Figure 29.Exam2.Php

3.5.5. Exam3.Php

Figure 30.Exam3.Php

In this page(Figure 30); The teacher creates the first option of the problem. The created choice of the problem is shown on the right side of the screen. When the teacher creates the option, he or she chooses the status to be right or wrong. When the "Next Option" button is clicked, the entered data is saved in the "q_option" table in the database and the page is refreshed to create other options. When the "Save and End Question" button is clicked, the question creation page (exam2.php) is redirected to create another problem.

3.5.6.Exam.php

In this page (Figure 31); the teacher sees the details of the exams. When the "Edit" button is clicked, the selected exam is redirected to the edit_exam.php page.
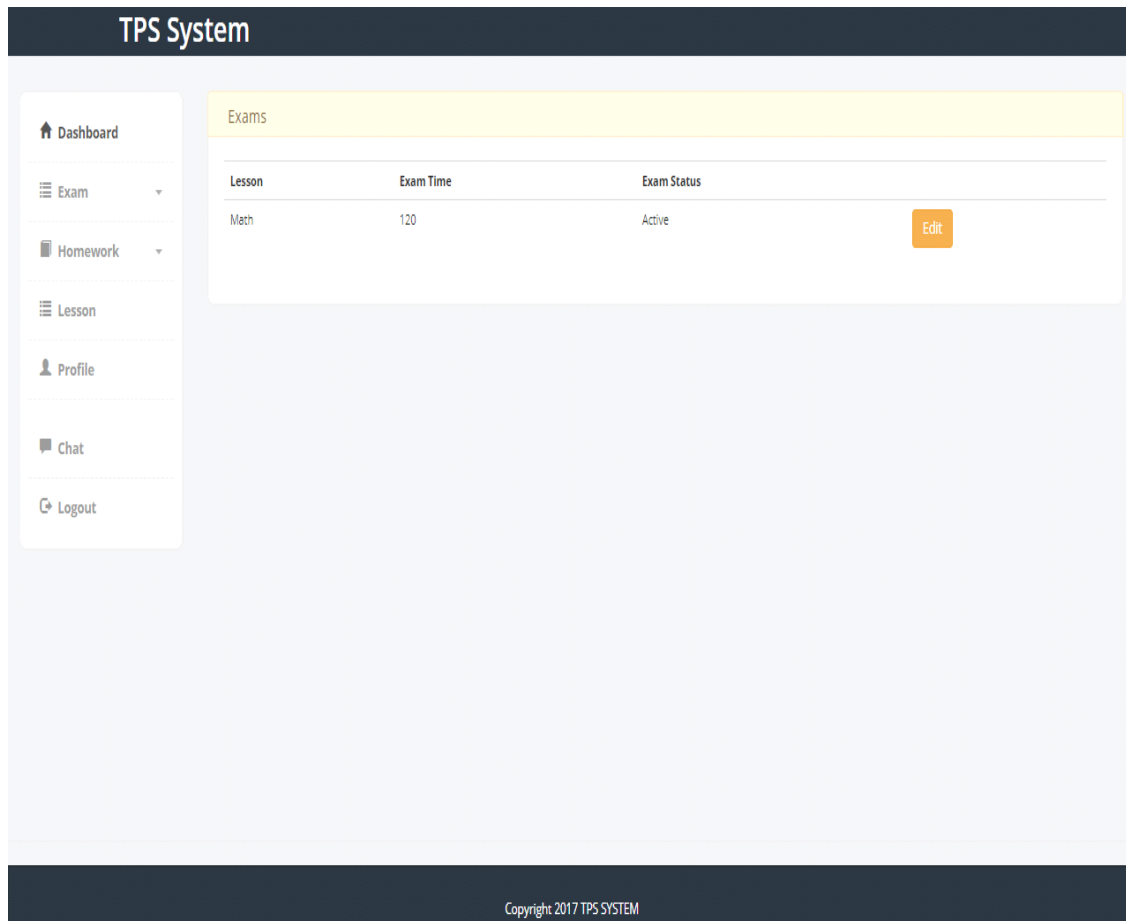
Figure 31.Exam.php

3.5.7.Edit_exam.php

In this page (Figure 32); the teacher is being directed to the areas where he / she can make arrangements related to the test. When the "Delete Exam" button is clicked, it is deleted from the exam database. When the "Add Question" button is clicked, it is directed to the page where new questions are added. When the "Edit Exam Lesson" button is clicked, the page is directed to the edit_exam_lesson.php page where the lesson of the exam will be changed. When the "Edit Exam Time" button is clicked, it is directed to the edit_exam_time.php page where the exam duration is arranged. When the "Edit Exam Status" button is clicked, it is directed to the edit_exam_status.php page where the exam status is set. When the "Edit Exam Questions" button is clicked, the page is redirected to the edit_exam_question.php page where the questions and their choices are arranged.

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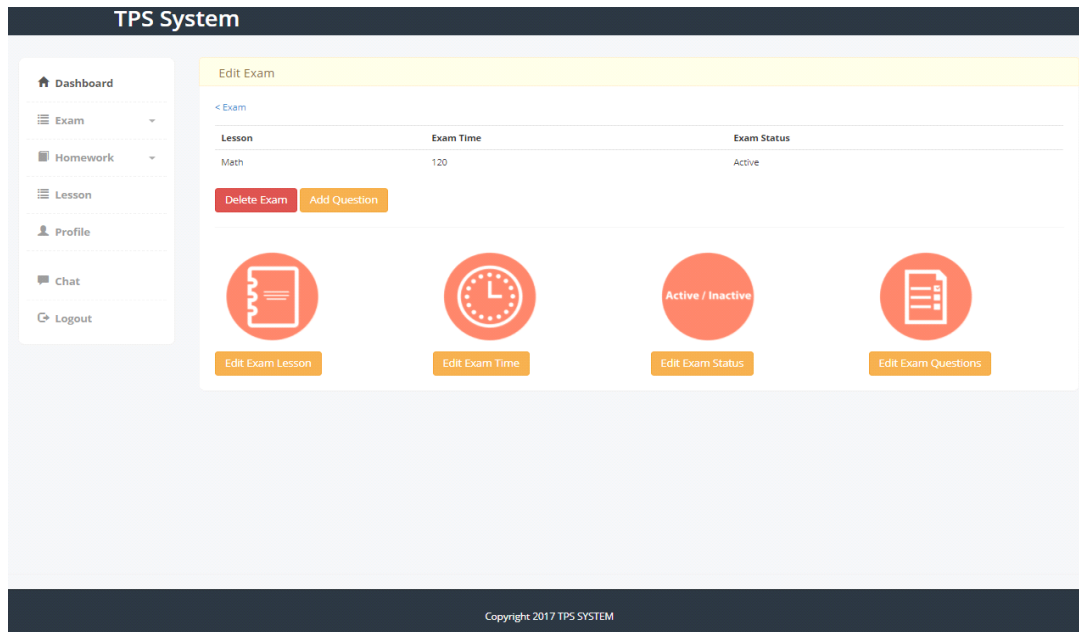
Figure 32.Edit_exam.php

3.5.8.edit_exam_lesson.php

In this page (Figure 33); the lesson of the selected exam is being changed. The selected new lesson is updated in the lesson_id column of the exam table.
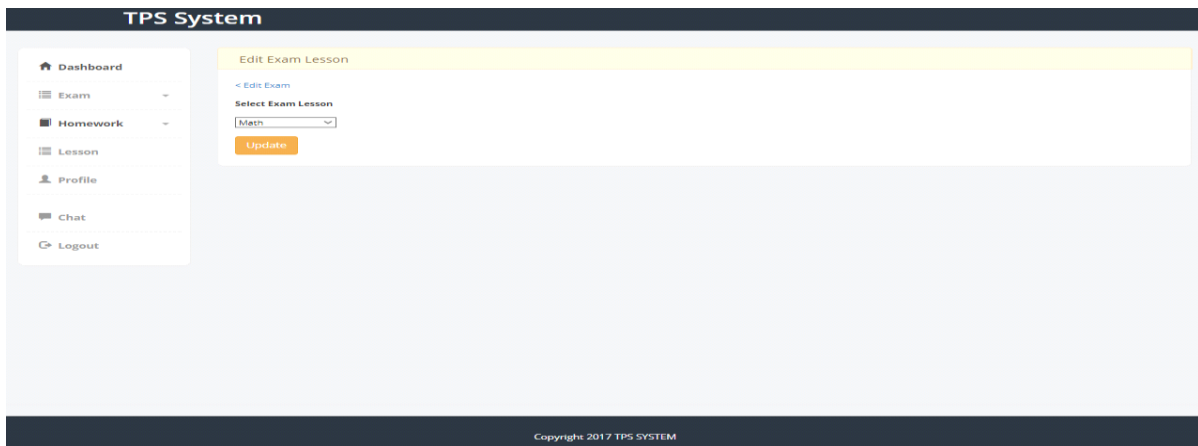
Figure 33.edit_exam_lesson.php

3.5.9.edit_exam_time.php

In this page(Figure 34); the duration of the selected exam is being changed. The new time entered is updated in the exam_time column of the exam table.
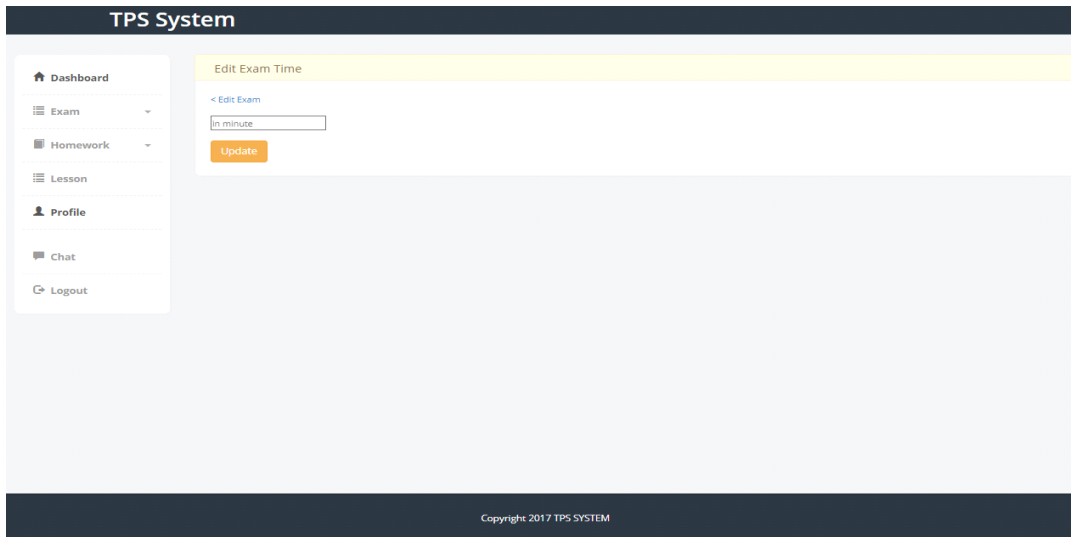

Figure 34.edit_exam_time.php

3.5.10.edit_exam_status.php

In this page (Figure 35); the selected exam is being changed to active or passive status. The selected new status is updated in the status column of the exam table.
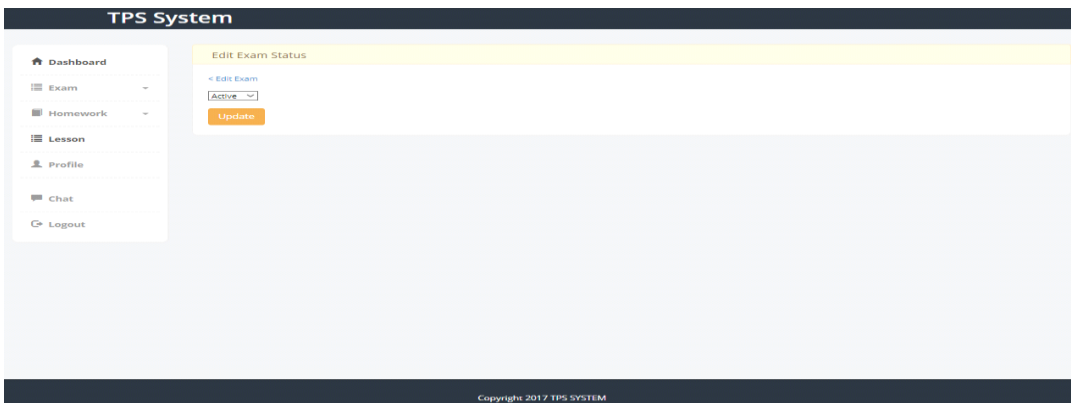
Figure 35.edit_exam_status.php

3.5.11.edit_exam_question.php

Figure 36.edit_exam_question.php

In this page (Figure 36); the selected exam questions and choices are drawn from the data base in text boxes. Teacher can change the questions, choices and right-wrong status of the questions here. When the "Update" button is clicked, question and option tables in the data database are updated. When the "Delete" button is clicked, the question is deleted from the database.

3.5.12.select_lesson_exam_result.php

In this page(Figure 37); the teacher chooses the lesson of the exam he / she wants to report. The lessons that can be selected here are the teacher's own lessons and he / she can't see other lessons. When the "Exam List" button is clicked, the page is redirected to the select_exam.php page where the exams related to the selected lessons are listed.
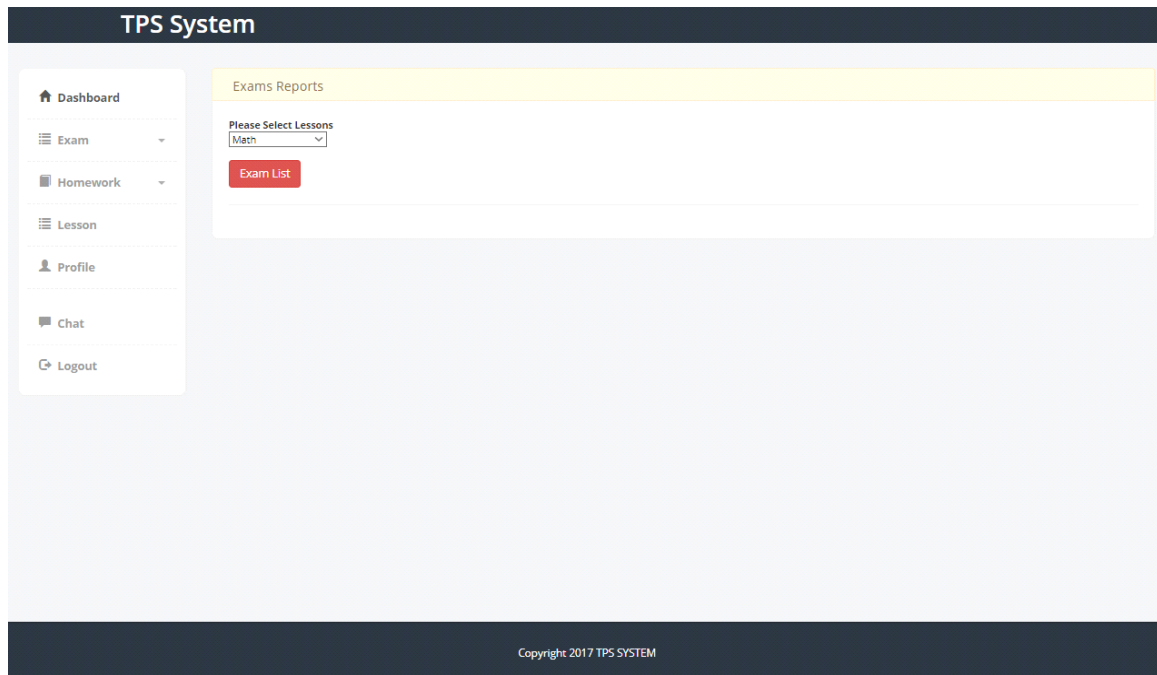

Figure 37.select_lesson_exam_result.php

3.5.13.select_exam.php

In this page (Figure 38); the exams related to the selected lessons are listed and when the "Report" button is clicked, the page is redirected to the list_students.php page where the students are listed.
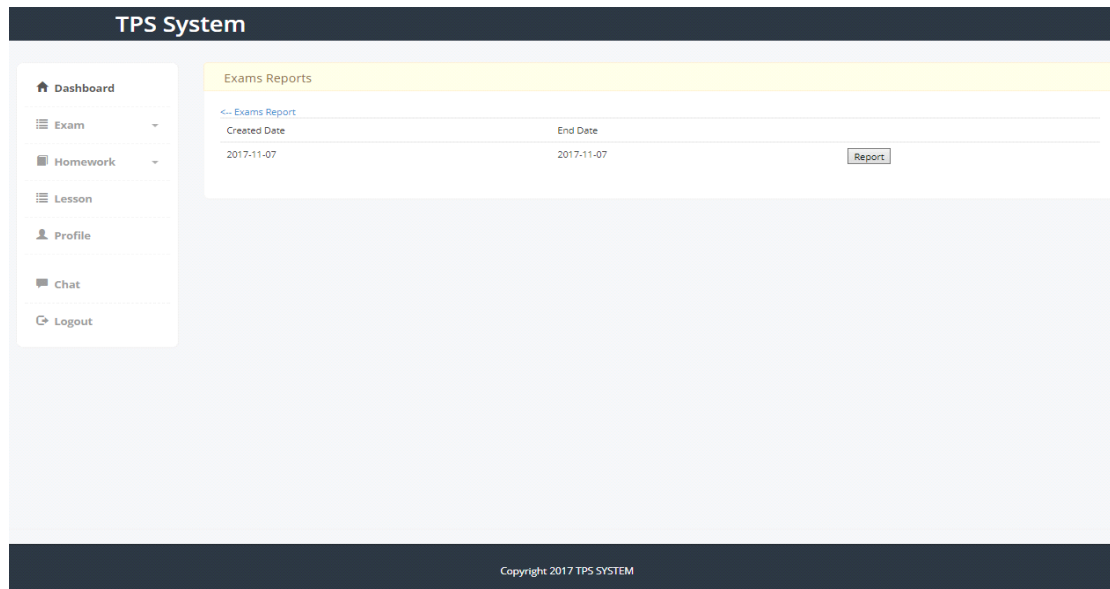

Figure 38.select_exam.php

3.5.14.list_students.php

In this page(Figure 39); the teacher sees a list of all the students but the "Report" button of the students who do not enter the test becomes passive, the teacher can only see the results of the exams of the students entering the examination.
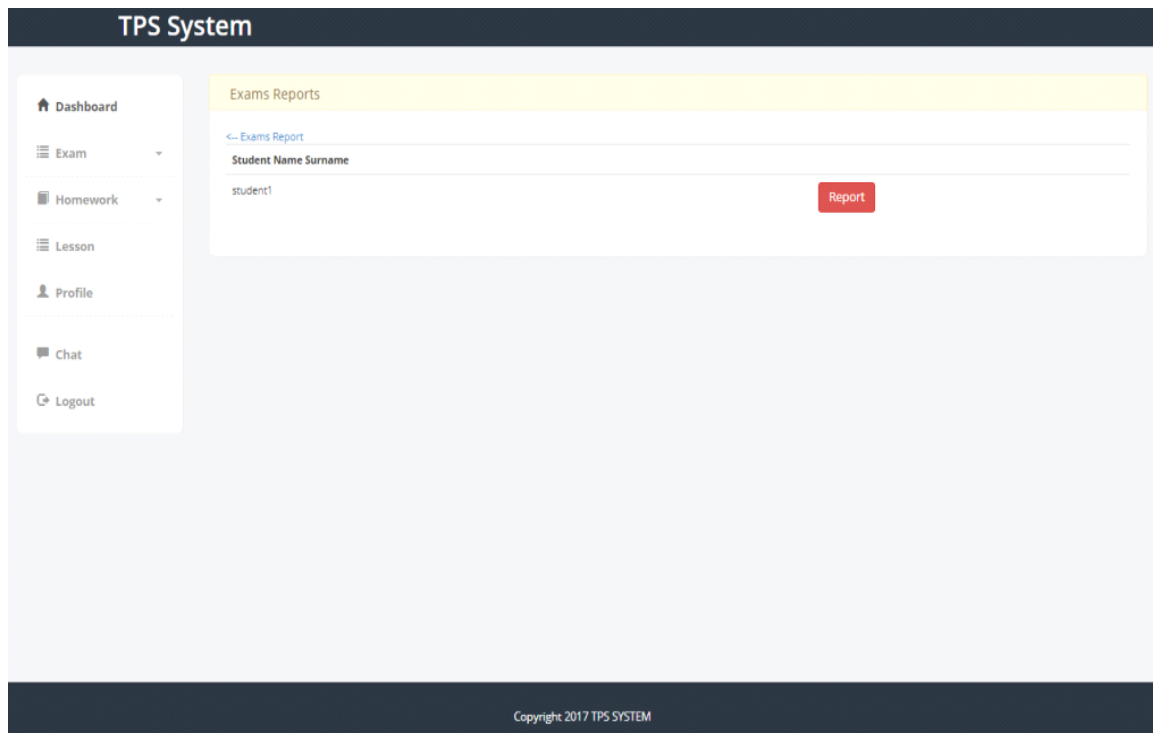
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Figure 39.list_students.php

3.5.15.teacher_exam_report.php

In this page (Figure 40); the teacher has access to the exam results of the selected student. The teacher sees the exam questions and the correct answers to the questions on the left of the page. On the right side of the page, he\she sees the answers given by the student, and at the bottom of the page he\she can see the total correct and false answer of the student and total point.

Figure 40.teacher_exam_report.php

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3.5.16.create_homework.php

Figure 41.create_homework.php

In this page (Figure 41); the teacher can choose the lesson of the homework, upload videos and files about the homework, determine the final upload date of the homework and write about the homework. Uploaded videos are recorded in the teacher / homework / video directory and the video URL is recorded in the video_url column in the teacher_homework table. Uploaded files are saved in the directory teacher / homework / file and the URL of the file is recorded in the file_url column in the teacher_homework table. The selected date is recorded in the end_date column in the teacher_homework table. The written comment is saved in the comment column in the teacher homework table. When the "Create Homework" button is clicked, homework is created.

3.5.17.teacher_homework.php

In this page(Figure 42); the teacher can see, edit, and delete the homework he\she has created. When the "Delete" button is clicked, the homework is deleted from the database. When the "Edit" button is clicked, the edit_homework.php page is redirected.
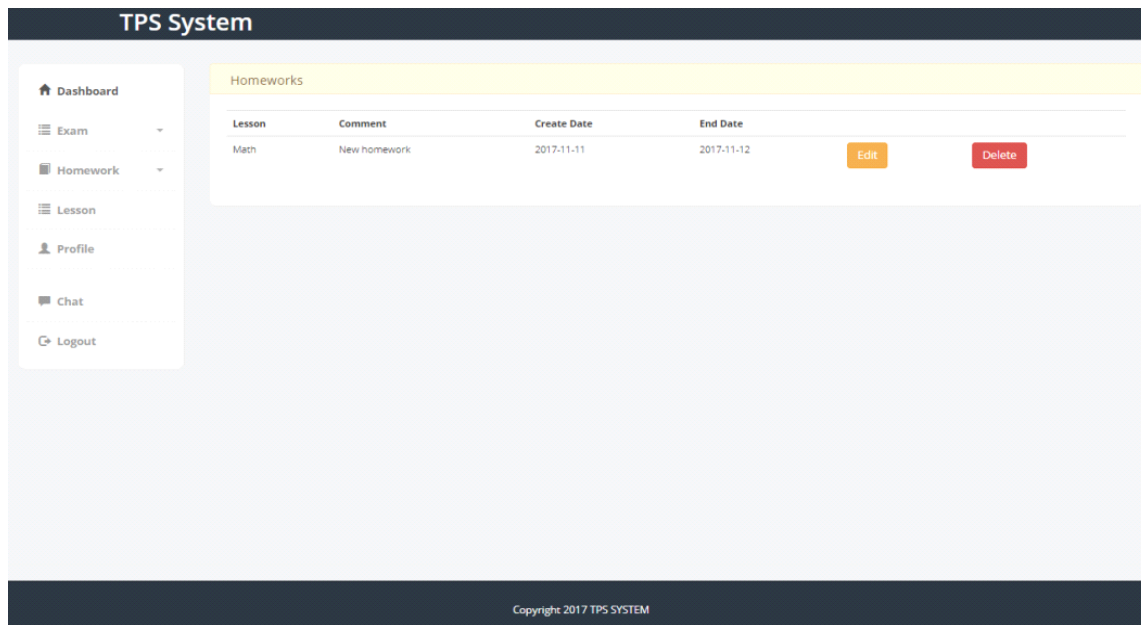

Figure 42.teacher_homework.php

3.5.18.edit_homework.php

In this page (Figure 43); the teacher can make arrangements for the homework that he / she has selected. The lesson, comment, last upload date, video file and file of the homework can be changed. Also on this page the teacher can watch the video that he has uploaded for the homework. When "Save All Changes" button is clicked, the newly entered data is updated in the database.
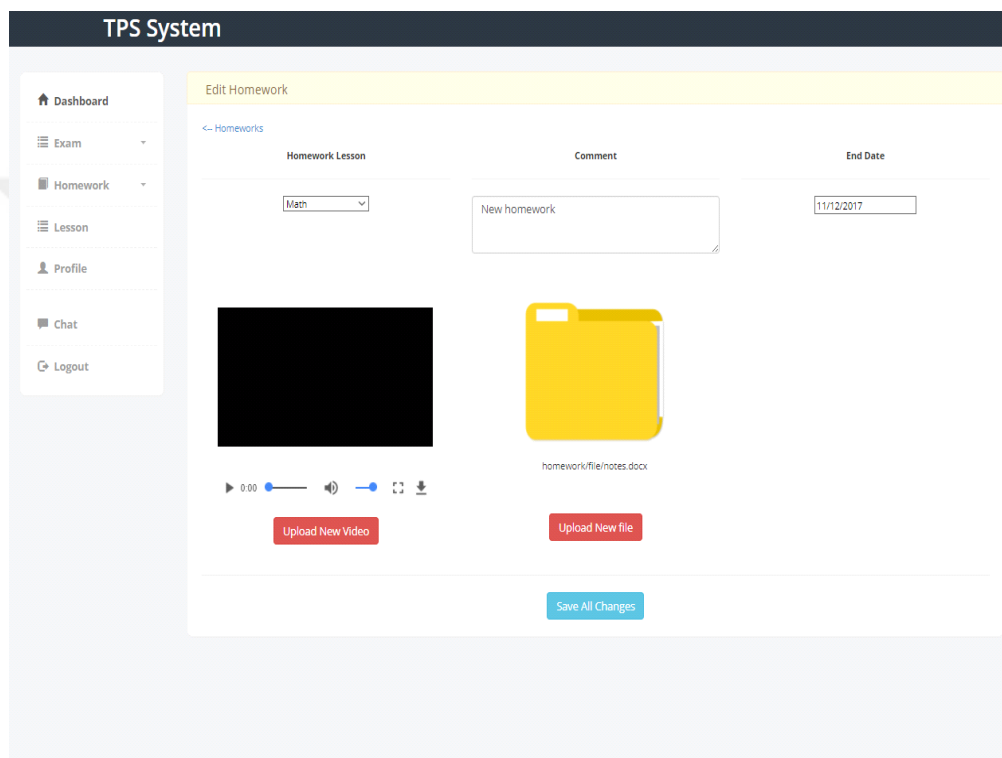

Figure 43.edit_homework.php

3.5.19.select_lesson.php

In this page (Figure 44); the teacher can make lesson choices. He\she can delete selected lessons. This page has been prepared considering that the teacher can enter more than one lesson. When the "Add Lesson" button is clicked, the selected course is registered to the teacher_lessons table in the database. When the teacher clicks the "Delete" button in front of his / her lessons, the selected course is deleted from the database.
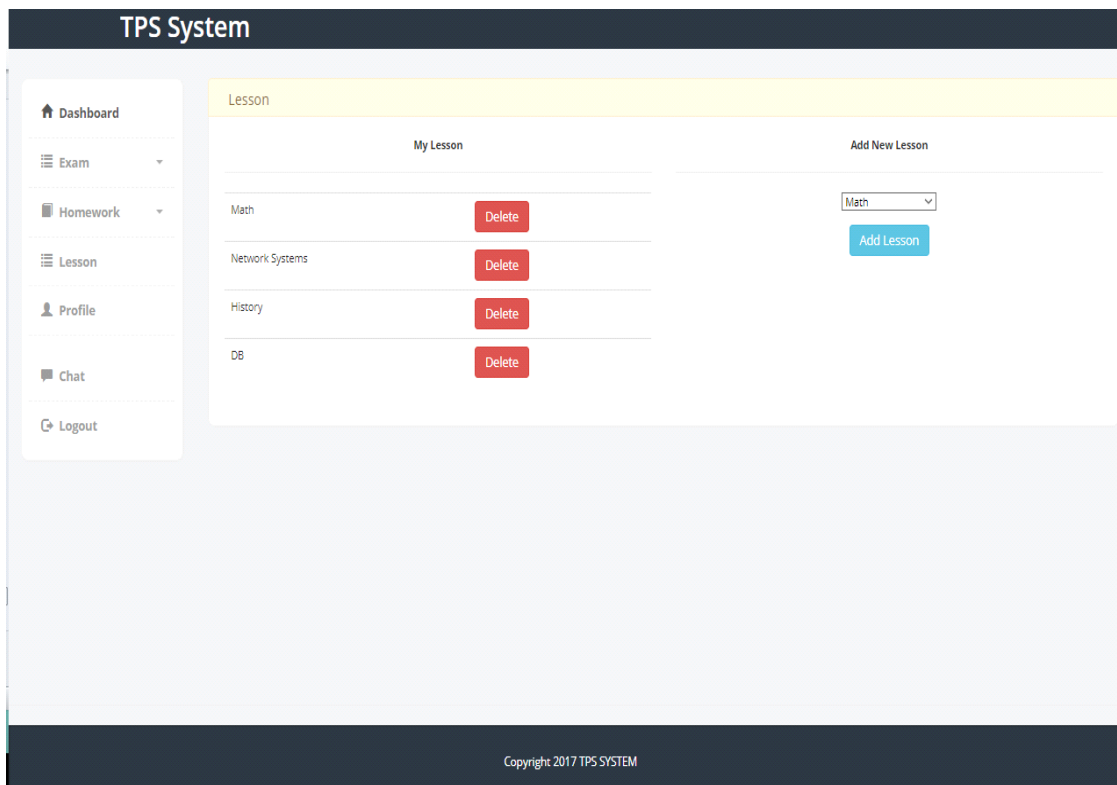

Figure 44.select_lesson.php

3.5.20.t_profile.php

In this page (Figure 45); The teacher views his / her profile. The teacher can change the profile picture and update the password on this page. When the "Change Picture" button is clicked, a field is opened to select a new picture and the teacher can upload the new profile picture. When the "Change Password" button is clicked, the teacher is asked to enter the old password and the new password. If the old password does not match the password in the database, the password is not updated.
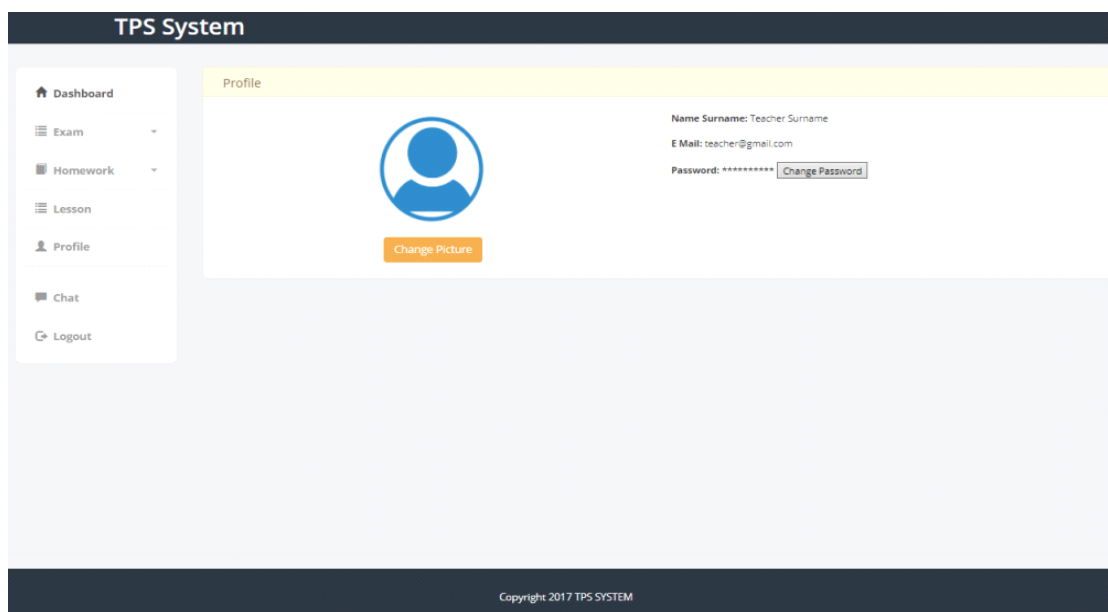

Figure 45.t_profile.php

3.5.21.chat_start.php

In this page (Figure 46); teachers see students online and offline. The teacher can start the conversation by clicking on the "Start Chat" button with a student he / she choice. If the chat is to be created for the first time, a random number is generated, and this number is recorded as a chat number in the database and also the teacher's id and student's id are registered in the database and a txt file is created under the chat file directory with the created chat number and the teacher's chat with the student is being held in this file. When the student sends a message to the teacher, the teacher is notified if the teacher is not on the chat page. Message_t field in the chat table of the database provides this notification, if the value in the message_t column is 0 when the student sends a message, the teacher is notified. When the teacher replies to the

message of the student the message_t columnis updated to value 1 and the notification is being removed. When the "Start Chat" button is clicked, the chat_index.php page is redirected.
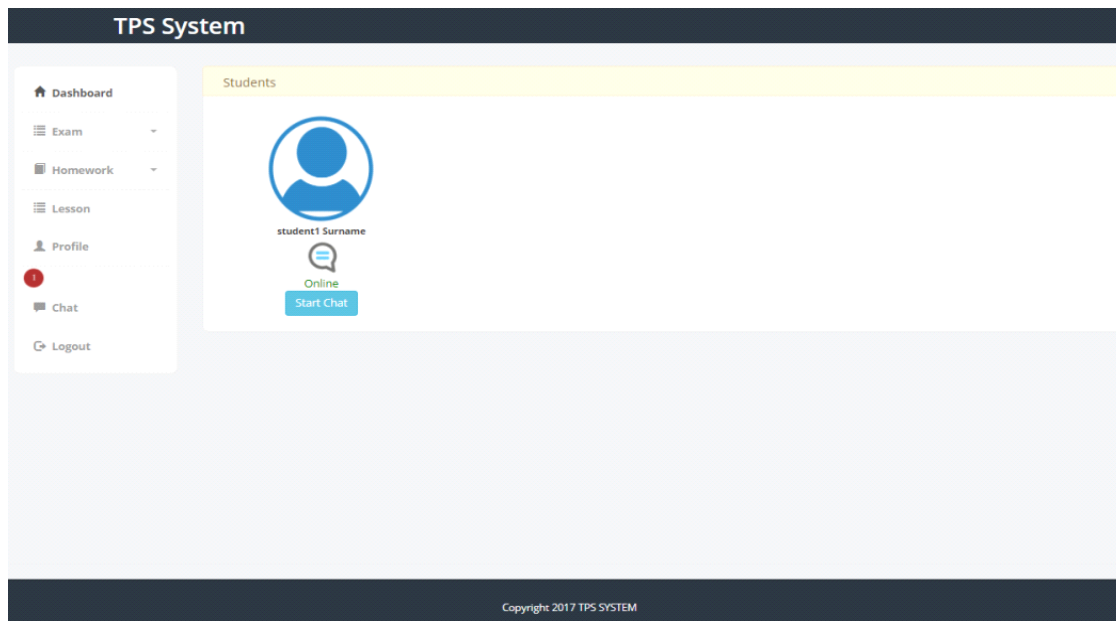

Figure 46.chat_start

3.5.22.chat_index.php
In this page (Figure 47); the teacher can send a message to the selected student. When the teacher writes the message and presses the enter key, the message goes, the outgoing message is saved in the created txt file.
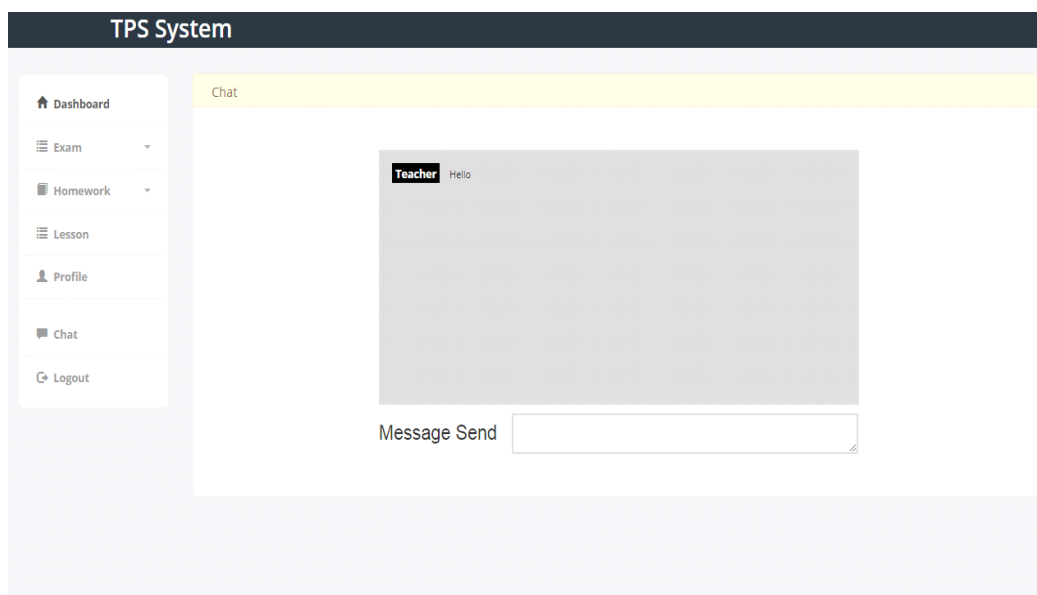
Figure 47.chat_index.php

3.5.23.Logout.php

In this page; the created session values are terminated and the value of the online column in the teachers table is updated to 0.

3.6. Student System Pages

3.6.1. General features

Student in this system,

- Can enter the exams created.
- Can see the results of the exam.
- Can upload homework.
- Can see the homework results.
- Can edit the profile.
- Can chat with the teacher.

3.6.2.dashboard.php

In this page (Figure 48); the student can see the exams and homework created during the day and also can see the last 3 exams that he / she has entered and the last 3 assignments.

Figure 48.dashboard.php

3.6.3. student_exam.php

In this page (Figure 49); the student can see the exams created by the teacher. If the student has not already entered the test, the "Start Exam" button becomes active. If the student has already entered the test, this button becomes passive. When the student clicks on the "Start Exam" button in front of the exam, they are redirected to the questions.php page. The exams listed here are; examinations that are active and have not passed the deadline.

Figure 49.student_exam.php

3.6.4.questions.php

In this page (Figure 50); the student can see the exam questions he has chosen and answer the questions. When the "Finish Exam" button is clicked, the answers given by the students are recorded in the student_exam table. At the beginning of the page there is a counter, which counts down during the exam period when the teacher has set the exam, and when the time is over, the exam ends. When the student finishes the exam, and clicks on the "Finish Exam" button, the page is redirected to the result.php page.
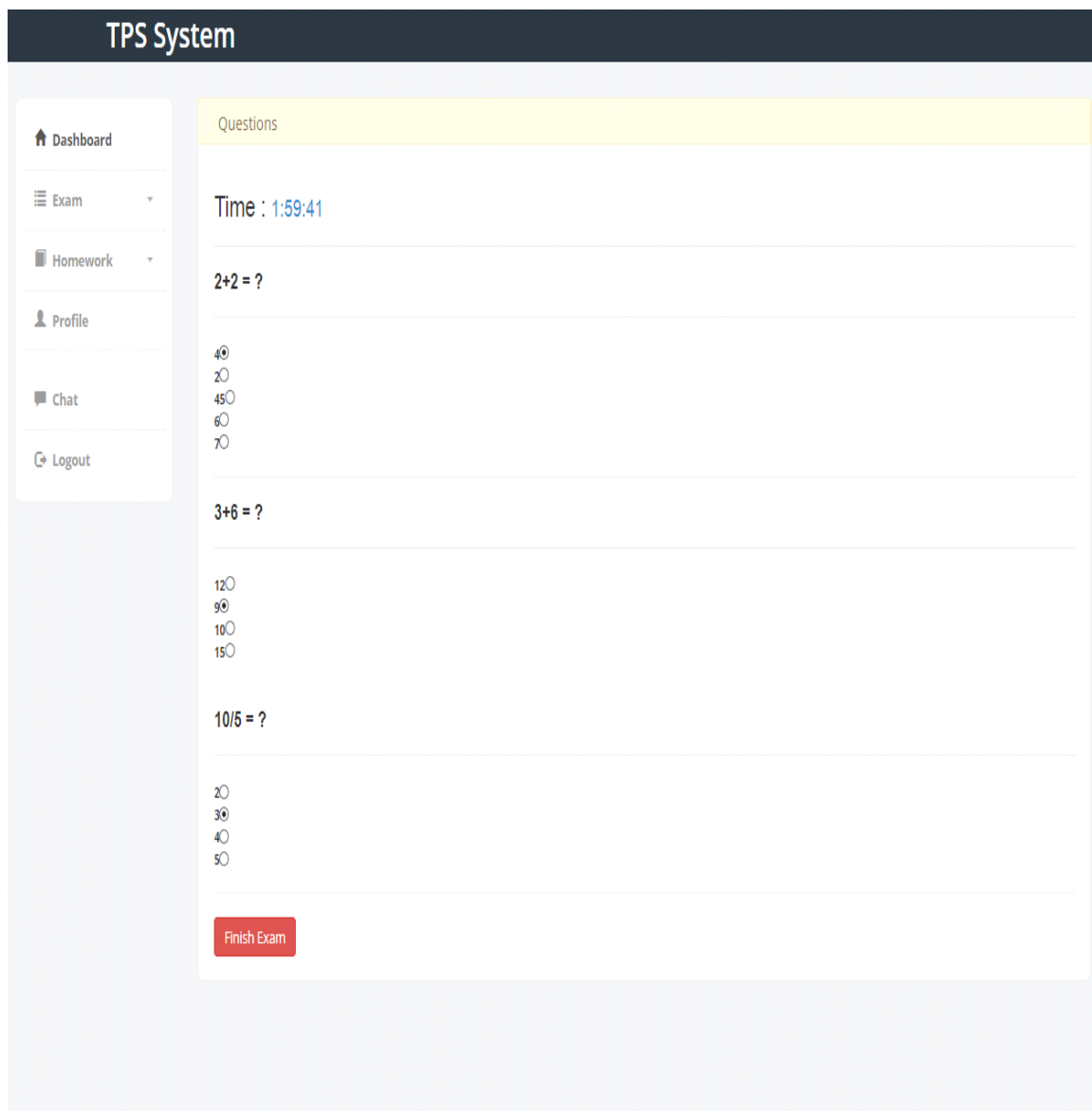
Figure 50.questions.php

3.6.5.exam_result.php

In this page (Figure 51); The student can see the exam result. On the left side of the page the student sees the exam questions and the correct answers, and on the right side he / she sees the answers he / she gave. At the bottom of the page, the student's total correct answers, total wrong answers and points from the exam are included

Figure 51.exam_result.php

3.6.6.exam_reports.php

In this page (Figure 52); the student can see all of the exams that have been created, but they can only see the results of the exams they have entered. When the "Report" button is clicked, it is redirected to the exam_result.php page.

Figure 52.exam_reports.php

3.6.7.list_homework.php

In this page (Figure 53); the student can see the assignments created. The homework's listed here are those that have not passed the last upload date, and the homework that has passed the last upload date is not listed here. When the "Details & Upload Homework" button is clicked, a redirect to student_homework.php page is accomplished.

Figure 53.list_homework.php

3.6.8.student_homework.php

In this page(Figure 54); the student can upload his / her homework to the system, watch the video about the homework, and view the homework file. When the "Upload" button is clicked, the file selected by the student is loaded into the student / homework directory, and the URL of the file is also saved in the file_url column in the student_homework table. If the student already uploads the file related to the homework, the file cannot be uploaded again. The note automatically becomes "X" when the student uploads the homework.
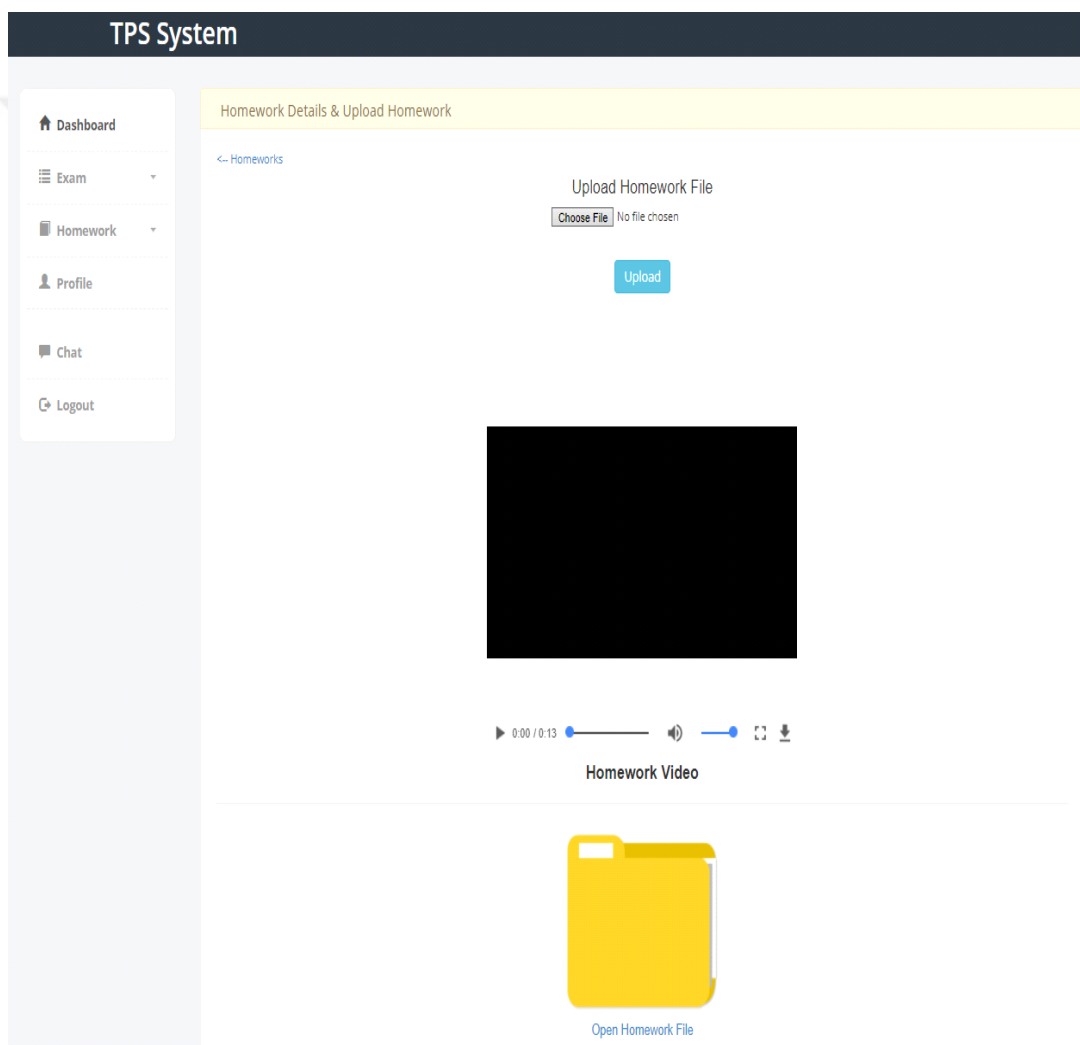
Figure 54.student_homework.php

3.6.9.student_homework_reports.php

In this page (Figure 55); the student can see the note of the assignments that he / she has uploaded.

Figure 55.student_homework_reports.php

3.6.10s_profile.php

In this page (Figure 56); The student views his profile. The student can change the profile picture and update the password on this page. When the "Change Picture" button is clicked, a field is opened to select a new image and the student can upload the new profile image. When the "Change Password" button is clicked, the student is asked to enter the old password and the new password. If the old password does not match the password in the database, the password is not updated.
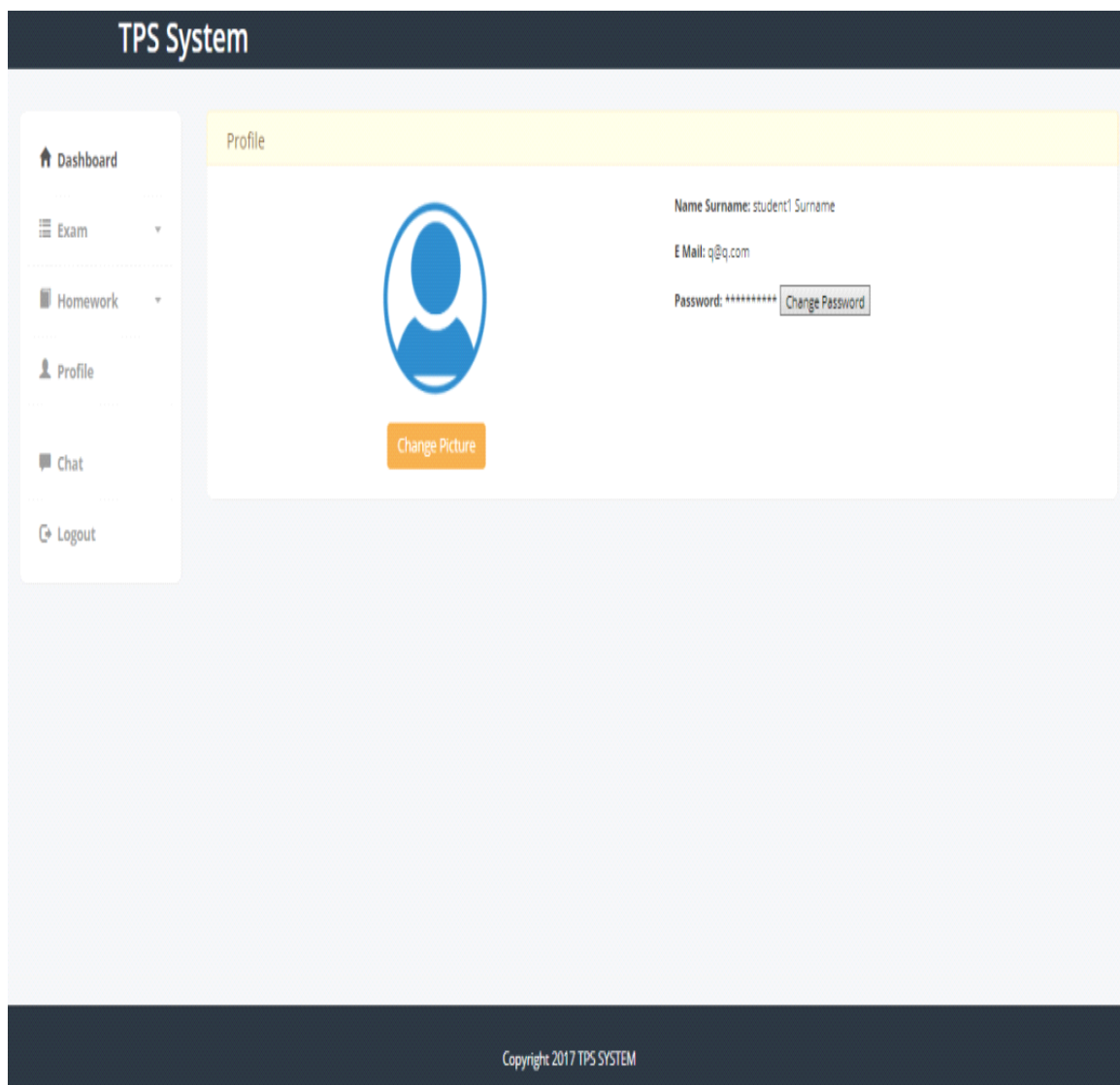
Figure 56.s_profile.php

3.6.11.chat_start.php

In this page (Figure 57); student sees teachers online and offline. The student can start the conversation by clicking on the "Start Chat" button with a teacher of his choice. If the chat is to be created for the first time, a random number is generated, and this number is recorded as a chat number in the database and also the teacher's id and student's id are registered in the database and a txt file is created under the chat file directory with the created chat number and the teacher's chat with the student is being held in this file. When the teacher sends the message to the student, the student is notified if the student is not on the chat page. Message_s field in the chat table in the database provides this notification, if the value in the message_s column is 0 when the teacher sends a message, the notification goes to the student. When the student replies to the message of the teacher, the message_s column is updated to value 1 and the notification is being removed. When the "Start Chat" button is clicked, the chat_index.php page is redirected.
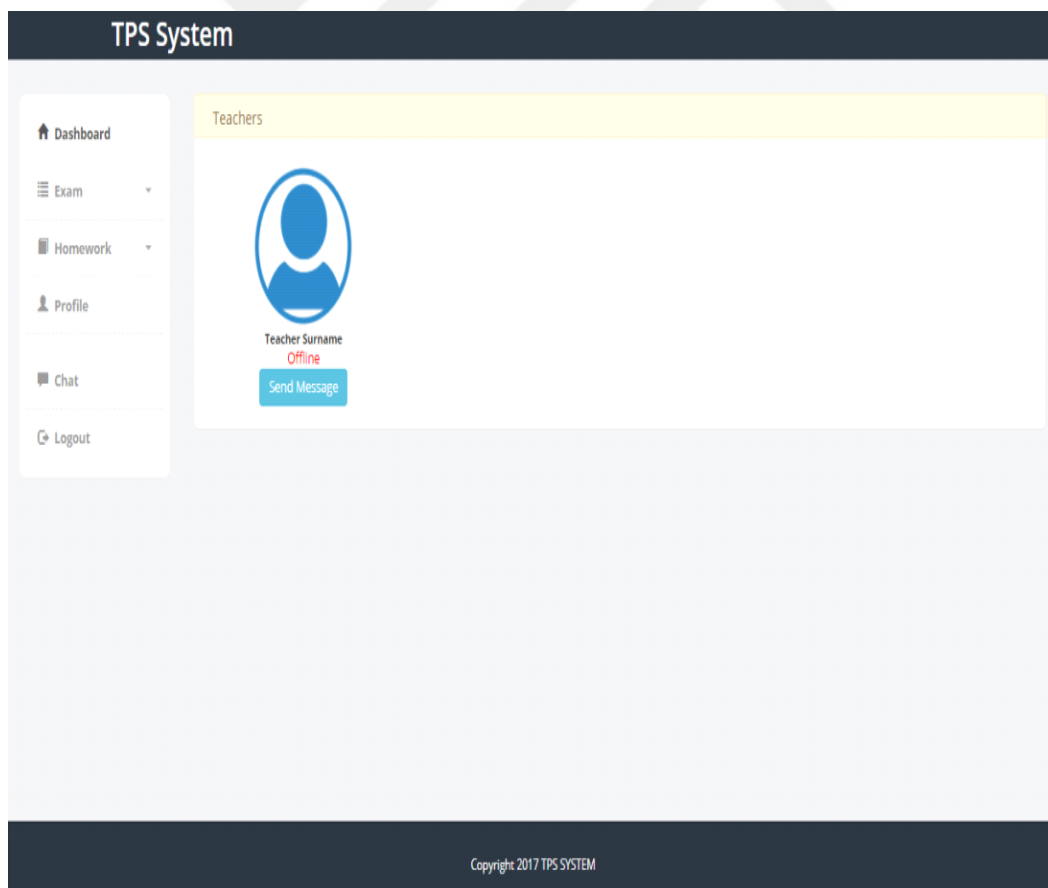
Figure 57.chat_start.php

3.6.12.chat_index.php

In this page (Figure 58); the student can send a message to the selected teacher. When the student writes the message and presses the enter key, the message goes, the outgoing message is saved in the created txt file.
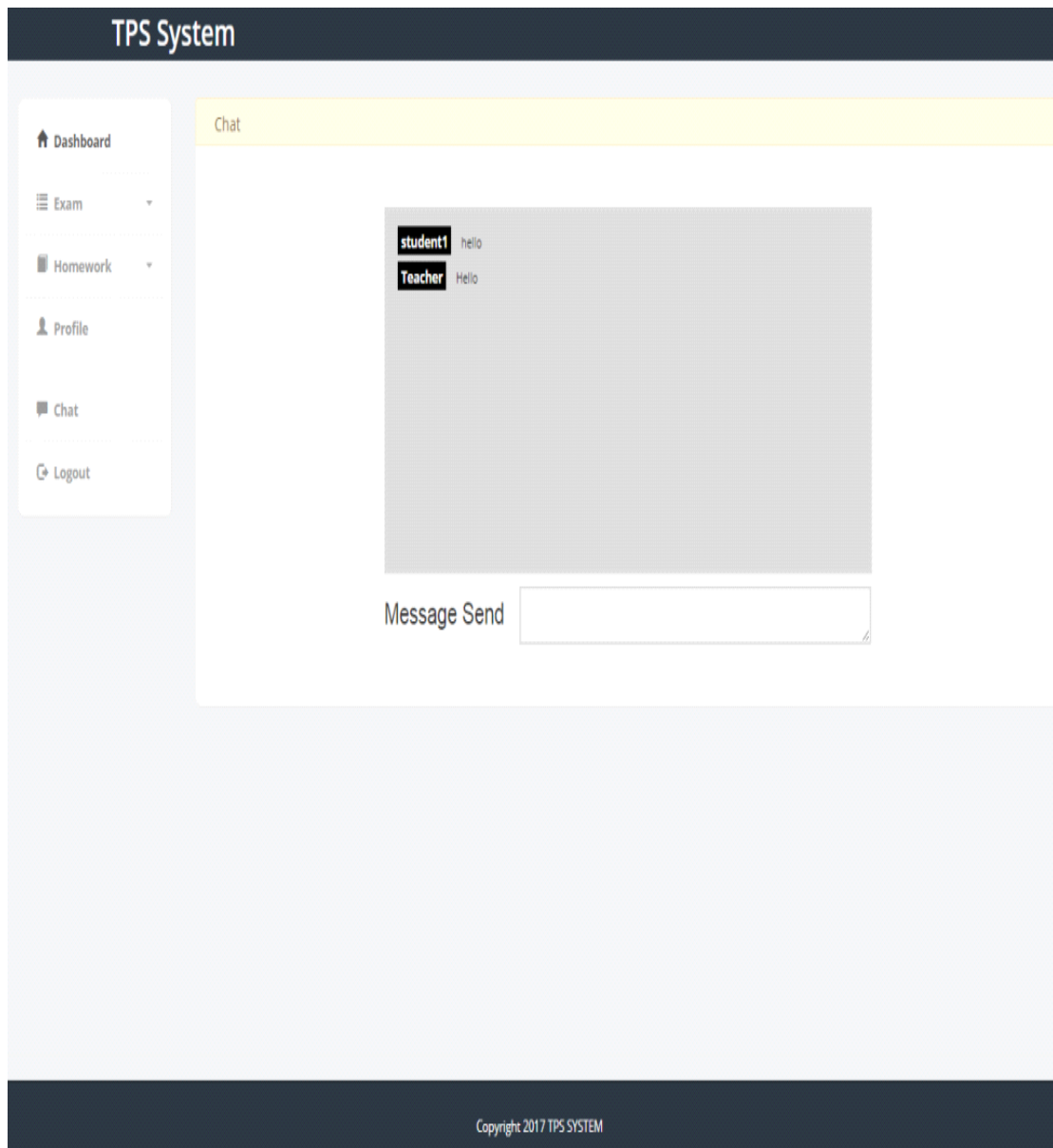
Figure 58.chat_index.php

3.6.13.Logout.php

In this page; the created session values are terminated and the online column value in the students table is updated to 0.

3.7. Parent System Pages

3.7.1. General features

Parent in this system;

- Can see the exam results of his / her student.

- Can see the homework results of his / her student.

3.7.2.parents_home.php

In this page (Figure 59); the parent can see the exams that the student has entered and when the "Report" button is clicked, the exam_report.php page is redirected to the exam_report.php page where the information about the selected exam is located.
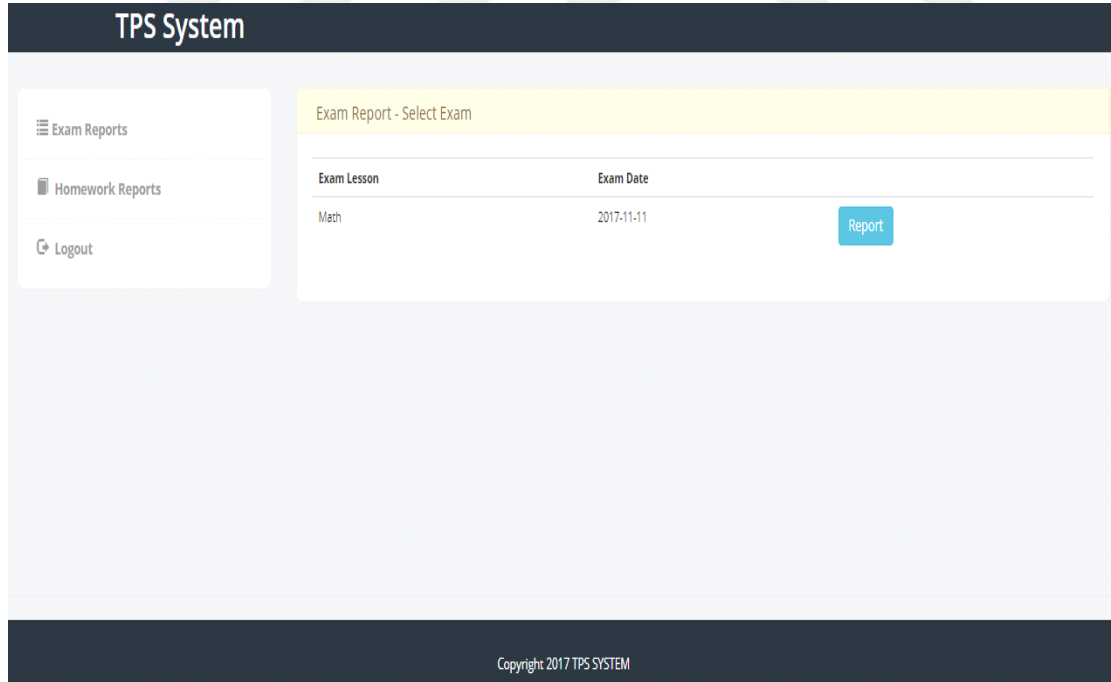
Figure 59.parents_home.php

3.7.3.exam_report.php

In this page(Figure 60); the parent can see the details of the exam the student has chosen.

8+3

11 - True
13
15

9-7

2 - True
1
4

87-7

80 - True
12
12

8+3

11 - True

9-7

1 - False

87-7

80 - True

Total True Answer: 3

Total False Answer: 1

Point: 75

Figure 60.exam_report.php

3.7.4.homework_report.php

In this page (Figure 61); the parent can see the details of his / her student's homework.

TPS System

☰ Exam Reports

📋 Homework Reports

↪ Logout

Homework Reports

Lesson	Comment	Date	Score
Math	New Homework	2017-11-11	X

Figure 61.homework_report.php

CHAPTER FOUR

COMPARISON AND CONCLUSION

4.1. Overview

in this chapter, comparison TPS a web-based homework system with the other research's paper with similar capabilities. And the conclusion and future work have been producing in this chapter.

4.2. Compare The TPS sytem and other web based homework system

The TPS system hase slight difference with the other web-based homework system have been developed. For example, HPCS (a web-based homework and project control) [61]. In this system C# programming language was used and MySQL was used as database. there are three types of user in the system developed. These users and the operations they can perform are shown in the table1.

User type	operations
Admin	Add users, add and edit course, view homework, delete homework
Teacher	Add and edit activities (homework or project), grading homework
Student	View activities (homework or project), upload file to activities, view grade

Table.1. HPCS users operation

The first step to run the system, the teachers and courses should be added by the admin and when the teachers log in to the system they can add the students and the homework of their courses to the system. The teacher also views the student's documents over the system, grade the document. Student can have sent his\her document for the activities and also can view grade of the activities. HPCS system is successfully tested in Sakarya university.

Some web-based homework systems have been also developed for instance, WBH Via 'TCExam' is an open source code system [62]. The project is based on physics at the secondary school level. The users and the operations they can perform are shown in the table2.

User type	operations
Admin	Add users ,provide the information seach as (period of the homework,total homework time,total score) , upload qustions and answer,control the system including the user and database mangement,view report result for homework students
Teacher	Homework design, view report result for homework students
Student	Perform the homework at any time within the period decided by the administrator
Parents	Receive the homework results report as pdf file through e-mail

Table.2. WBH Via TCExam operation users

The main structure of 'TCExam' is divided into two main sections, public and administration. The public area is where the students perform the assignments and teachers design homework. The administration section consists of the interface that control the system including the user and database management, generation of the assignment and results. WBH Via TCExam is successfully tested in Malaysian secondary schools.

İn this sudy,TPS system is developed as aweb based homework and is using php programming language, Mysql as database.TPS system have many advantages than 'HPCS' system and WBH Via TCExam system. The users and the operations they can perform are shown in the table3.

User type	operations
Admin	Give approval to users, database mangement
teacher	Upload questions and ansewr,upload video,veiw report result for performance students,sent and resived message through chat.
student	perform exame at any time within the period decided by the teacher, veiw grade, upload file to homework ,do chat .
parents	view report about there childern performance.

Table.3.TPS system operation users

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İn TPS system users (teacher,parents,student) they can register themselves to the system and after get username and password they can login to the TPS system and they can see there profiles and they can change there password and picture.another feture to TPS system , teacher can upload vedio about homeworkto explain the homework to the students and also teacher can send or recived message through the chat with ther students. Parents also can enter to the system and view report about there childern performance.

Conclusion

Homework has an important place in the activities of both the student and the teacher. Web-based homework systems in developing information technologies have many advantages compared to paper-pencil homework. The use of web-based homework systems eases the work of teachers, provides comfort to students, and ensures that parents are aware of their children's situation.

Nowadays, many countries are using web-based homework system. In this respect, a web-based homework system TPS (Teacher Parents Student) developed for Iraq schools. This system was coded in Php programming language, MySQL was used as database and Bootstrap is used as a framwork. In order to design this system, first of all database was designed by using the draw.io online platform and the tables was created in the database according to the relationship between the users of the system. There are three types of user in the system developed. These users (Teacher,Parents,Student) can register themselves to the system useres cannot login to the system unless have approval from the administrator. Administrator gives approval to the users authorized to enter the system for security reasons.

TPS a web-based homework grant teacher the opportunity to:

- Create exams, create homework, upload video about homework.

- Access to see the exams and the homework they have created easily.

- Edit, correct, add the exam and homework they have created previously.

- See students' performance report.

- To choose their lessons at any given time and quarter of the school year within the school term or semester depending on their teaching groups.

- Create a chat room with their students which can take the lessons furthermore into a better understanding.

This system, also aims to educate and empower students through the; Web-based homework system which will help the students to enhance and achieve their goals through these following

- Allow students to gain the opportunity to enter in for the exams that have been created by their teachers through the same system.

- Allow students to gain the opportunity to see the results of the exam that have been created by their teachers through the same system.

- Allow students to gain the opportunity to upload homework that have been created by their teachers through the same system.

- Allow students to gain the opportunity to see their homework results that have been created by their teachers through the same system.

- Allow students to gain the opportunity to edit their student's profile.

- Allow students to gain the opportunity to chat with their teacher.

within the same system; Web-based homework TPS system aims to support parents with ways on how they could be an active part of the system, through these following enlisted advantages:

- Parents will be given the rare opportunity to see the exam results of the student their (children).

- Parents will be given the rare opportunity to also see the homework results of the student their (children).

The TPS system developed in this study has many advantage over other web-based homework system. For instance, web-based homework system (WBH) that is developed by utilizing "the free open source software" (FOSS), TC Exam was developed in 2014, in Malaysia. This TCExam have four users, admin, teachers, students and parent where the students perform the assignments and teachers design homework. But this system was based on only Physic and tested successfully in Malaysian secondary schools as a web-based homework system. TPS system is suitable to all kinds of homework and can be adapted to any kind of schools. Also, a web-based homework system(HPCS) (a web-based homework and project control).In this system system C# programming language was used, and MySQL was used as database, this system have three users, admin teachers and students and is consisted of activities of submitting homework and grading homework by teachers was tested in Sakarya University successfully. But in this system, there is no follow-up by parents through the system. TPS includes parent as

a user, where they can enter to the system and view report about their children performance also in TPS system, not only homework, but exams can be created, correct the exam answer by the system directly. As a result, TPS system is more complicated than other systems. TPS system has more good futures and ıt will help all participants in education system.

In future, it is possible to make the TPS system as management system that includes the student's attendance and payment information, school activity calendar, management library.

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