ABSTRACT

This project is a Web based grading and tracking system for the M.L. Garza Gonzales Charter School in Corpus Christi, Texas. This system design benefits teachers, principals, administrators and students when compared to the current manual system at the school. Teachers can maintain grades, create lesson plans, provide information on assignments and tutorials and monitor the performance of each student. The principal can monitor students and teacher’s lesson plans and tasks accomplished. Administrators can export grades of the students from the database to their system without manual entry. Parents can monitor the progress of their students online. Finally students can receive online progress reports and assignments/tutorial information.
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1. BACKGROUND AND RATIONALE

1.1 Dr. M.L. Garza Gonzales Charter School

The Dr. M. L. Garza Gonzales Charter School is one of the programs of the Gulf Coast Council of La Raza, a non profit organization serving students labeled at risk. Individual at this school are divided into four categories:

1. Teachers
2. Principal and Assistant Principal
3. Curriculum/Testing Director
4. Students/Parents.

The Web based grading and tracking system can be used in a variety of ways by teachers, principals, administrators and students/parents.

1.2 Overview of the Current System and Its Difficulties

1.2.1 Teachers

The current system forces teachers to manually enter the grades on a grade sheet. Teachers are responsible for daily grades, weekly grades and the academic cycle grades. A semester has three academic cycles and each academic cycle has six weeks. It is very tedious and time consuming to keep track of these grades manually. There is no easy way to backup this information except to look back into the daily grade books and submit the grades periodically to administrators.

Teachers are also required to submit lesson plans for the week every Monday at 8:00 A.M and they are either printed or hand written. Many teachers do not have the
advantage of working at home on lesson plans as they don’t have printers or copying machines at home.

### 1.2.2 Principal and Assistant Principal

It is a tedious job for the Principal to collect lesson plans in the form of a paper copy, to keep track of them every week, and to store them. It is also difficult for the Principal to determine if the tasks mentioned in the lesson plans have been accomplished in the class rooms. The Principal has to talk to every teacher in person to get an update on their progress. Similarly is the case with progress of students. The Principal has to always depend on the teacher to determine, when he/she has a parent teacher conference.

### 1.2.3 Curriculum/Testing Director

In the current system the curriculum/testing director gives each teacher a students list at the end of each cycle for whom the academic cycle grades must be awarded. Teachers manually enter grades on these papers and submit the results to the administrator’s office. These grades are then manually entered into the system in the administrator’s office. The curriculum/testing director has to depend on the teachers to get immediate information on grades.

### 1.2.4 Parents and Students

Currently, parents do not have an easy method to keep track of the grades of their children. They must depend on their children in order to see the progress reports or they must schedule an appointment with the teachers.
Students do not have the convenience of working at home on class assignments or tutorials. If the students are absent from school then they have to sacrifice their free time to make up the work at school.

1.3 Need for Online Grading and Tracking System (OGTS)

The Online Grading and Tracking System is designed to transfer information in an immediately usable form into the Regional Service Center Computer Cooperative System (RSCCC). The paper copy of the grades have to be manually entered into the RSCCC System which is time consuming and tedious. The online grading system is a way to serve the needs of parents/students, faculty and staff and saves lots of time and effort. Staff need not have to wait several days for grade materials to be gathered, as grades can be turned in much faster.

1.3.1 Teachers

Teachers can eliminate the use of grade sheets, thus eliminating the tedious job of tracking those sheets and also saving storage space. Below are some of the important functions benefiting the teachers:

- Academic semester grades can be entered online, providing an easy access to data for tracking students.
- Lesson plans can be created online providing the convenience of working from any location.
- Reduced burden at the end of academic cycle to submit the student grades to the administrator’s office.
1.3.2 Principal and Assistant Principal

The Principal of a school has many responsibilities and time is very important to him. The Online Grading and Tracking system helps the principal in saving a lot of time and effort. The information he/she requires is at his/her finger tips. Some of the functions that help the Principal are mentioned below:

- Easy access to teacher’s lesson plans online,
- Ability to track and monitor teacher’s lesson plans, and
- Ready access to each student’s information.

1.3.3 Curriculum/Testing Director

The curriculum/testing director has a tough job of entering the grades manually into the RSCCC System. This method utilizes lots of time and effort. The Online Grading and Tracking system can come over these difficulties. Some of the functions, which benefit the users in the administrative department are mentioned below:

- Elimination of data entry of each student’s information at the end of each academic cycle,
- Student’s data can be directly imported to readily usable form, and
- Student’s data is readily available for corrections.
1.3.4 Parents and Students

Parents have to be in constant touch with the officials of the school to track the Academic progress of their children. Some of the methods include parent teacher conferences, calling teachers on phone or by mail. These procedures have their own drawbacks like the need to schedule meetings in their free time, the non-availability of teachers and the delay in receiving the information by mail. The Online Grading and Tracking System eliminate most of these difficulties for the parents. Students are also benefited and some of the functions are mentioned below:

- Online access to monitor the progress of students,
- Online communication with teachers, and
- Students can access tutorials and assignments information.
2. NARRATIVE

The Online Grading and Tracking System is a multi-user project serving the needs of a school. The users of this system were previously categorized as:

1. Teachers
2. Principal and Assistant Principal
3. Administrative Office
4. Students/Parents.

Based on these categories, the Online Grading and Tracking System is divided into four interfaces. The main page of this system has a menu on the left hand side, providing links to the home page of the school, announcements, support, creating account for new users and guest logon. The center of the page has a log on screen which is common to all the interfaces. The existing user logs on to the system by entering their user id, their category (e.g. Administrators, Teachers, Principal and Student/Parent/Guardian) and the correct password. New users have to create their accounts by sending a request to the system administrator by an e-mail. The links on the menu provide information about the school and how to use Online Grading and Tracking System. Figure 2.1 shows the login interface.
2.1 Teacher’s Interface

M.L. Garza Gonzales Charter School includes students from 6th grade to 12th grade. The school has morning and afternoon sessions. Teachers have to grade and track the students in morning and afternoon sessions. Teachers access the main menu after they enter the user id and password.

The main menu consists of links to Grade Book, View Lesson Plans, Create Lesson Plans, Change Password, Announcements, Assignments and Tutorials. Figure 2.2 shows teacher’s interface.
Figure 2.2 Teacher Interface

When the user clicks the Grade Book, a menu shows grades six through twelve. A teacher has to click on a grade to access a student’s records in that grade. The student record also has a link to his/her email and the guardian’s email for quick contact. A link is provided to print class reports. Figure 2.3 shows teacher’s grade book.
Teachers create new lesson plan by clicking *Create Lesson Plan* link. Various fields are provided for entering information about lesson plans. The State of Texas Education Board, mandates that students learn definite objectives in order to obtain credits for different subjects. Testing for these objectives is done by the school. Also students must pass the Texas Assessment of Knowledge and Skills (TAKS) exam to pass on to the next grade level. The TAKS exam is conducted by the State Education Board. There are different objectives outlined for TAKS. A link is provided to access the objectives mandated by the State Education Board for different grades and also the
objectives of the TAKS. Teachers can use the information from these links to align the objectives to give instruction in class. Figure 2.4 shows teacher’s interface to create lesson plans.

Figure 2.4 Create Lesson Plans

Clicking on View Lesson Plans enables teachers to look at the lesson plans created and they can enter information to track their lesson plans. Teachers also have access to the lesson plans from previous years and can modify them for the current academic year, saving a lot of time and effort. A printable report can be obtained from here. Figure 2.5 shows teacher’s interface to view lesson plans.
Figure 2.5 View Lesson Plans

Change Password link is used to change the password. Teachers click Announcements link to post student’s comments and modify them as needed. Teachers also get latest information from school administration or principal. Figure 2.6 shows teacher’s interface to read announcements and post student comments.
Assignments link facilitate teacher to provide students with assignments. Figure 2.7 shows teacher’s interface to manage assignments. Post Assignment link is used to upload assignments for each student. Review Assignments link is used to manage the posted assignments. Dropbox link is used to check the assignments submitted by the student. Figure 2.8 shows teacher’s interface to upload assignments.
Figure 2.7 Assignments

*Tutorials* link allow the teachers to upload the tutorials on the server for students. Teacher can delete tutorials after reviewing the assignments. Teachers can post important Internet links by clicking on *Post Web Links*
2.2 Principal and Assistant Principal’s Interface

The Principal and Assistant Principal’s interface allows users to perform all the tasks that a teacher can perform. Principal/Assistant Principal has the ability to access the main menu after they enter the user id and password. The main menu consists of:

1. *Grade Book*
2. *View Lesson Plans*
3. *Create Lesson Plans*
4. *Change Password.*

Figure 2.8 Upload Assignments
In addition to these actions principal/assistant principal has additional links which are not accessible to teachers, parents and students. These links provide flexibility to designated user to administer various tasks. Figure 2.9 shows principal’s menu.

5. Announcements
6. Objectives
7. System Administration
8. Review Lesson Plans

**Figure 2.9 Principal/Assistant Principal Interface**

Clicking on Objectives allows the principal to update objectives listed by Texas Education Board which will be reflected on the list of objectives that are viewed by teachers. The Announcements link is used to give information to the teachers,
eliminating the need of staff meetings every week. The Review Teachers Lesson Plans allow the user to view the lesson plans of teachers. The System Admin link allows the user to create new accounts, assign students to teacher and view progress of students.

2.3 Curriculum/Testing Director

Important members of the administrative office have access to administrative interface. The primary users of this interface are the officials in charge of testing and curriculum. These officials need the student’s information at the end of every academic cycle so that they can make an entry of the academic grades in the grading system. The users of this interface have all the privileges of the principal. They can print progress reports for each student. Users can access the main menu after they enter the User id and Password. The main menu of this interface has links similar to the above interfaces. Figure 2.10 shows System Admin menu.
2.4 Student-Parent Interface

Students and parents are the primary users of this interface. Parents access the academic progress of their children by entering the *User id* and *Password* provided by the school. Also an email system is provided so that parents can email teachers to inquire about their children. A student uses the same password provided to the parents to access their accounts. The main menu of this interface has links to *Progress Report*, *Assignments*, *Teacher Comments*, *Announcements* and *Tutorials*. Students or parents check the student’s progress by accessing these links. Tutorials are posted on Website which can be accessed by clicking the *Tutorials* link. Assignments are provided for make up work and extra credit. Students who miss the classes can go through an online tutorial and access the assignments information and submit assignments to the teacher by clicking
on the *Assignments* link. Otherwise students who are absent must come to school and spend extra time to make up absences. This online tool eliminates the process of spending extra time at school. Important Internet links are posted by the teachers and they can be accessed by selecting *Web Sites* Figure 2.11 is a parent/student interface.
3. SYSTEM DESIGN

This project is a Web based grading and tracking system for the M.L. Garza Gonzales Charter School in Corpus Christi, Texas. The project includes HTML (Hyper Text Markup Language) for static page designs, Java script to validate user input and PHP (Hypertext Preprocessor) as programming language for dynamic pages. The backend database is an open source MySQL database system.

3.1 System Architecture

Three-tier architecture was used to develop the Online Grading and Tracking System. Standard three-tier architecture has the user interface in the client browser, the application server (Web server), and the database server. A graphical representation of flow diagram of the architecture is given in Figure 3.1. The functional description of the architecture is given below.

**Client Tier** is responsible for the presentation of data, receiving user events and controlling the user interface. The user interface is implemented using HTML pages and PHP script was used to validate user input and it will be executed on the client’s Web browser.

**Application Server Tier** protects the data from direct access by the clients. The tier will consist of an Apache Web server with mod_php (PHP module). The PHP module includes support for several database backends including MySQL. The Apache Web server was used to execute PHP scripts which process the user input, generate SQL queries to access the database and then process the output in dynamically generated HTML pages.
*Data Server Tier* is responsible for data storage. The tier consists of the MySQL database server that receives requests from the PHP scripts to execute SQL statements. The MySQL server executes the SQL statements and sends the queried data back to the scripts. The server accesses the database files to retrieve the stored data.

![Figure 3.1 Flow Diagram of System Architecture](image)
3.2 Hardware Requirements

The project is implemented on a Windows operating system installed on the school server. An Apache Web server is installed, which functions as a Web server for the system. The Web server runs the PHP scripts and database modules.

<table>
<thead>
<tr>
<th>Processor</th>
<th>PC with a Pentium II-class processor, 450MHz. (recommended: Pentium III-class, 600MHz or better)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Available Hard Disk Space</td>
<td>100 MB</td>
</tr>
<tr>
<td>Operating System</td>
<td>Linux</td>
</tr>
<tr>
<td>Memory</td>
<td>256 MB RAM</td>
</tr>
<tr>
<td>Video</td>
<td>800x600, 256 colors (Recommended: High Color 16-bit)</td>
</tr>
<tr>
<td>CD-ROM or DVD-ROM,</td>
<td>Required</td>
</tr>
<tr>
<td>Pointing Device</td>
<td>Microsoft Mouse or compatible</td>
</tr>
</tbody>
</table>

3.3 Software Requirements

The Online Grading and Tracking System is a Web based system, thus, HTML is used to develop the static pages. PHP script is used to perform the client side validations. The user has to enter the URL in order to access the Online Grading and Tracking System in his/her Web browser. The browser sends a request to the Web server to fetch an HTML page or execute the server side script. PHP is used for server side scripts, which use SQL queries to access the database tables, retrieve the data and dynamically
generated HTML pages to send back to the client’s browser. MySQL is the database used to store the data.

### 3.3.1 PHP

PHP is a widely-used general-purpose scripting language that is especially suited for Web development and can be embedded into HTML [PHP-1 2004]. PHP succeeds an older product, named PHP/FI. PHP/FI was created by Rasmus Lerdorf in 1995, initially as a simple set of Perl scripts for tracking accesses to his online resume. He named this set of scripts 'Personal Home Page Tools'. A whole new language was released under a new name, that removed the implication of limited personal use that the PHP/FI 2.0 name held and it was named plain 'PHP', with the meaning being a recursive acronym - PHP: Hypertext Preprocessor. PHP is a server-side scripting language. A server-side scripting language is one, which has the capability of executing the script on the server and serving the output as an HTML file. Server-side scripts have the main advantage of interacting with databases, as well as performing all types of server manipulations directly. Server-side scripting languages can manipulate the data which is received from Web forms, anywhere on the Net [PHP-2 2004].

PHP has many advantages when compared to its major competitors like ASP, PERL, and Cold Fusion:

- Exceptionally short learning curve
- Quick development time
- Very high performance
- High Speed
- Superior Memory Management
- No Hidden Costs with PHP
- Integration with MySQL
- Closer to Java/C++ Style of Programming
- Cross Platform Migration Strategy

3.3.2 MySQL

MySQL is an open source relational database management system, is developed, distributed, and supported by MySQL AB. MySQL, being an Open Source system, is free software and the source code for the server software is freely available [MYSQL 2004]. The MySQL is an open source relational database management system developed by a Swedish company called MySQL AB and is also available on a commercial basis. The project is typically funded by the provision of commercial support by the developers. The unique separation of the core server from the storage engine makes it possible to run MySQL under strict transaction control or with ultra fast transaction less disk access, whichever is most appropriate for the situation. Data in a MySQL database is extracted, inserted, and updated using SQL, or Structured Query Language. MySQL outperforms other databases in benchmarking tests [IIC NET 2004].
3.4 Design Process

A brief explanation on how the project was developed is given below

- Identified the project concept and got the primary information required to develop the project from the M. L. Garza Gonzales Charter School.
- Developed a simple prototype model and reviewed with the school.
- Modified the design for necessary changes and which was then reviewed to get final approval.
- Developed project concepts in extreme detail. Designed and generated tables with data for the project.
- Developed user interactive Web pages for the project.
- Tested the project on different platforms and made final changes.
- Demonstrated the project to the school officials.
- Made final corrections to the project.
- Implemented and evaluated the project.
- Imported the data into the tables.

3.5 Structure Chart

The structure chart has an entry for every type of categorization under consideration [IBM 2004]. The OGTS structure chart is shown in Figure 3.2.
Figure 3. 2 OGTS Structure Chart
3.6 Entity – Relationship Diagram

ER diagram is a standard method of visualizing a database and for understanding the relationships between the tables. The *users* tables have four entities called Administrators, Principal, Teachers and Students. Administrators/Principal manages many teachers and students. Similarly they are responsible for making many announcements. Teachers manage many students, courses, progress of students, grades and create many lesson plans. Students take many courses and receive grade for each course respectively. Each student will also receive one progress report. Each course will have many objectives. These relationships are shown in Figure 3.3.
Figure 3.3 ER Diagram
3.7 Database Tables

MySQL is a relational database management system. A relational database stores data in separate tables rather than putting all the data in one big storeroom. This provides speed and flexibility [MYSQL 2004]. The tables are linked by defined relations making it possible to combine data from several tables on request. The SQL part of MySQL stands for "Structured Query Language" - the most common standardized language used to access databases. The following are the tables required for the Online Grading and Tracking System.

- Login and Password table for authentication
- Table containing user details
- Table containing the details of the courses the student is taking
- Table containing grades details
- Table containing lesson plan details
- Table containing user identification information
- Table containing objective details
- Table containing announcement details
- Table containing assignments details
- Table containing tutorial details
### 3.7.1 Login Table

The *login* table as shown in Figure 3.4 has the login identity and password information. Primary key is *login_id* and the foreign key is *level_id*. The *level_id* field identifies the category of the user.

<table>
<thead>
<tr>
<th>Field</th>
<th>Type</th>
<th>Collation</th>
<th>Attributes</th>
<th>Null</th>
<th>Default</th>
</tr>
</thead>
<tbody>
<tr>
<td>login_id</td>
<td>varchar(15)</td>
<td>latin1_swedish_ci</td>
<td>No</td>
<td></td>
<td></td>
</tr>
<tr>
<td>password</td>
<td>varchar(50)</td>
<td>latin1_swedish_ci</td>
<td>No</td>
<td></td>
<td></td>
</tr>
<tr>
<td>level_id</td>
<td>int(10)</td>
<td></td>
<td>UNSIGNED</td>
<td>No</td>
<td>0</td>
</tr>
</tbody>
</table>

**Figure 3.4 Login Table**

### 3.7.2 User Table

The *user* table has the information of all the users in OGTS. The structure of the table is displayed in Figure 3.5. The primary key for the *user* table is *login_id*.

<table>
<thead>
<tr>
<th>Field</th>
<th>Type</th>
<th>Collation</th>
<th>Attributes</th>
<th>Null</th>
<th>Default</th>
</tr>
</thead>
<tbody>
<tr>
<td>login_id</td>
<td>varchar(15)</td>
<td>latin1_swedish_ci</td>
<td>No</td>
<td></td>
<td></td>
</tr>
<tr>
<td>first_name</td>
<td>varchar(15)</td>
<td>latin1_swedish_ci</td>
<td>No</td>
<td></td>
<td></td>
</tr>
<tr>
<td>last_name</td>
<td>varchar(15)</td>
<td>latin1_swedish_ci</td>
<td>No</td>
<td></td>
<td></td>
</tr>
<tr>
<td>email</td>
<td>varchar(20)</td>
<td>latin1_swedish_ci</td>
<td>No</td>
<td></td>
<td></td>
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<tr>
<td>address</td>
<td>text</td>
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<td>No</td>
<td></td>
<td></td>
</tr>
<tr>
<td>attempts</td>
<td>int(11)</td>
<td></td>
<td>No</td>
<td></td>
<td>0</td>
</tr>
</tbody>
</table>

**Figure 3.5 User Table**
### 3.7.3 Courses Table

The *courses* table has information of the courses offered to the students. *Courses* table is shown in Figure 3.6. The primary keys for the table are *login_id* and *course_num*.

<table>
<thead>
<tr>
<th>Field</th>
<th>Type</th>
<th>Collation</th>
<th>Attributes</th>
<th>Null</th>
<th>Default</th>
</tr>
</thead>
<tbody>
<tr>
<td>course_id</td>
<td>int(11)</td>
<td></td>
<td>No</td>
<td></td>
<td></td>
</tr>
<tr>
<td>course_num</td>
<td>varchar(20)</td>
<td>latin1_general_ci</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>course_name</td>
<td>varchar(30)</td>
<td>latin1_general_ci</td>
<td>No</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Figure 3.6 Courses Table**

### 3.7.4 Grades Table

The *grades* table has the student academic information. The structure of *grades* table is shown in Figure 3.7. The primary keys for the table are *login_id*, *Course_num* and *semester*. The instructor_id is the index.

<table>
<thead>
<tr>
<th>Field</th>
<th>Type</th>
<th>Collation</th>
<th>Attributes</th>
<th>Null</th>
<th>Default</th>
</tr>
</thead>
<tbody>
<tr>
<td>login_id</td>
<td>varchar(15)</td>
<td>latin1_swedish_ci</td>
<td>No</td>
<td></td>
<td></td>
</tr>
<tr>
<td>course_num</td>
<td>varchar(10)</td>
<td>latin1_swedish_ci</td>
<td>No</td>
<td></td>
<td></td>
</tr>
<tr>
<td>grade</td>
<td>varchar(10)</td>
<td>latin1_swedish_ci</td>
<td>No</td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>percent</td>
<td>int(10)</td>
<td>UNSIGNED</td>
<td>No</td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>instructor_id</td>
<td>varchar(15)</td>
<td>latin1_swedish_ci</td>
<td>No</td>
<td></td>
<td></td>
</tr>
<tr>
<td>semester</td>
<td>varchar(10)</td>
<td>latin1_swedish_ci</td>
<td>No</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Figure 3.7 Grades Table**

### 3.7.5 Lesson Plans Table

The *lessonplans* table has the lesson plan information created by the respective users of OGTS. The structure of the *lessonplans* table in Figure 3.8 indicates that
*login_id*, *semester* and *course_num* are the primary keys. The *file* field has lesson plan content.

<table>
<thead>
<tr>
<th>Field</th>
<th>Type</th>
<th>Collation</th>
<th>Attributes</th>
<th>Null</th>
<th>Default</th>
</tr>
</thead>
<tbody>
<tr>
<td>id</td>
<td>int(11)</td>
<td></td>
<td></td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>login_id</td>
<td>varchar(15)</td>
<td>latin1_sweedish_ci</td>
<td>No</td>
<td></td>
<td></td>
</tr>
<tr>
<td>course_num</td>
<td>varchar(10)</td>
<td>latin1_sweedish_ci</td>
<td>No</td>
<td></td>
<td></td>
</tr>
<tr>
<td>semester</td>
<td>varchar(10)</td>
<td>latin1_sweedish_ci</td>
<td>No</td>
<td></td>
<td></td>
</tr>
<tr>
<td>file</td>
<td>text</td>
<td>latin1_sweedish_ci</td>
<td>No</td>
<td></td>
<td>0000-00-00</td>
</tr>
<tr>
<td>lesson_date</td>
<td>date</td>
<td></td>
<td>No</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Figure 3.8 Lesson Plan Table**

### 3.7.6 User Identification Table

The *level* table is the user identification table. The *level_id* field identifies the type of user depending on the *level_position*. The structure of the table is shown in Figure 3.9. The primary key for the table is *level_id*.

<table>
<thead>
<tr>
<th>Field</th>
<th>Type</th>
<th>Collation</th>
<th>Attributes</th>
<th>Null</th>
<th>Default</th>
</tr>
</thead>
<tbody>
<tr>
<td>level_id</td>
<td>int(10)</td>
<td></td>
<td>UNSIGNED</td>
<td>No</td>
<td>0</td>
</tr>
<tr>
<td>level_position</td>
<td>varchar(15)</td>
<td>latin1_sweedish_ci</td>
<td>No</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Figure 3.9 Level Table**

### 3.7.7 Objective Table

The *objective* table has all the information regarding the objectives that have been mandated by the state. Teachers can refer to these objectives when they prepare the lesson plans. The structure of the *objective* table is shown in Figure 3.10. The primary key for the table is *course_num*. 
3.7.8 Assignments Table

The Assignments table has the information of the assignments. assign_id is the primary key and login_id is the index. The assign field holds the location of the assignment on the server. Figure 3.11 briefs the structure of assignments table.
3.7.9 Announcements Table

The structure of the \textit{announcements} table is shown in Figure 3.12. This table has the information of the announcements made by the users of OGTS. The primary key for the table is \textit{announce_id} and the \textit{level_id} is the index.

\begin{table}[h]
\centering
\begin{tabular}{|c|c|c|c|c|c|}
\hline
Field & Type & Collation & Attributes & Null & Default \\
\hline
login_id & varchar(15) & latin1_swedish_ci & No & \\
 announce_id & int(11) & & No & \\
view_permission & int(10) & UNSIGNED & No & 0 \\
announcement & text & latin1_swedish_ci & No & \\
announcement_date & date & & No & 0000-00-00 \\
level_id & int(10) & & No & 0 \\
nname & varchar(20) & latin1_swedish_ci & No & \\
\hline
\end{tabular}
\caption{Announcement Table}
\end{table}

3.7.10 Tutorials Table

The \textit{tutorials} table has the information of the tutorials. \textit{tid}, \textit{login_id} and \textit{course_num} are the primary keys. The \textit{file} field holds the location of the tutorials on the server. Figure 3.13 briefs the structure of \textit{tutorials} table.

\begin{table}[h]
\centering
\begin{tabular}{|c|c|c|c|c|c|}
\hline
Field & Type & Collation & Attributes & Null & Default \\
\hline
tid & int(100) & & No & \\
login_id & varchar(15) & latin1_general_ci & No & \\
course_num & varchar(10) & latin1_general_ci & No & \\
semester & varchar(10) & latin1_general_ci & No & \\
file & text & latin1_general_ci & No & \\
title & varchar(100) & latin1_general_ci & No & \\
tutorial_date & date & & No & 0000-00-00 \\
nname & varchar(15) & latin1_general_ci & No & \\
\hline
\end{tabular}
\caption{Tutorials Table}
\end{table}
3.8 Data Flow Diagram

Data flow diagrams are a network representation of a system. They are the cornerstone for structured systems analysis and design. The diagrams use four symbols to represent any system at any level of detail. The four entities that must be represented are:

data flows - movement of data in the system
data stores - data repositories for data that is not moving
processes - transforms of incoming data flow(s) to outgoing data flow(s)
external entities - sources or destinations outside the specified system boundary. The Context Level DFD for OGTS is shown in Figure 3.14.

![Figure 3.14 Context Level Data Flow Diagram](image)

The data flow in OGTS is simple and easy. The Level 0 DFD for the OGTS is illustrated in Figure 3.15. The Administrator/Principal is provided with eight options to choose after their login information is validated. The administrator/principal can verify the progress of the students, review teacher lesson plans, create/view their lesson plans if they are teaching, change their password, make announcements and administer the system. In system administration the users can create/modify all the user accounts, assign courses to students, and generate reports. The DFD for System Administration is illustrated in Figure 3.16.
The roles for teachers are very much similar to administrator/principal with reduced functionality. The teachers can view/edit grades of the students, view/create lesson plans and view announcements. The student can view the progress report, assignments, tutorials, teacher comments and announcements. The student can also email the faculty.
Figure 3.16 Data Flow Diagram (System Administration)
3.9 Listing of Major Scripts

Table 3.2 shows the listing of major scripts and their brief description.

Table 3.2 Major Scripts

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Script Name</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>index.php</td>
<td>Welcomes message to OGTS website.</td>
</tr>
<tr>
<td>2</td>
<td>auth.php</td>
<td>Verifies the username and password.</td>
</tr>
<tr>
<td>3</td>
<td>changepassword.php</td>
<td>Allows the user to change his password.</td>
</tr>
<tr>
<td>4</td>
<td>choosegrades.php</td>
<td>Allows the user to view/edit student info.</td>
</tr>
<tr>
<td>5</td>
<td>announce.php</td>
<td>Allows user to make announcement</td>
</tr>
<tr>
<td>6</td>
<td>delete_user.php</td>
<td>Deleting the user from the students table</td>
</tr>
<tr>
<td>7</td>
<td>new_user.php</td>
<td>Adding the new users information</td>
</tr>
<tr>
<td>8</td>
<td>updateuserform.php</td>
<td>Generates list of users to edit info</td>
</tr>
<tr>
<td>9</td>
<td>db_connect.php</td>
<td>Connects to database</td>
</tr>
<tr>
<td>10</td>
<td>Newrequests.php</td>
<td>Displays the new exam requests that students</td>
</tr>
</tbody>
</table>
3.10 Security

The Web browser is primary connection to the rest of the Internet, and multiple applications rely on the browser, or elements within the browser, to function. This makes the security even more important. Thus Web applications in OGTS are enhanced with security features, as the database contains vital information. The safest policy is to disable the majority of the features unless they are necessary. The security is implemented by the use of session id, password authentication, and account lock.

- **Session Id**: All the scripts accessing the database are validated before the information is retrieved from the database. The user is directed to the login page if the session is expired. Steps are taken to expire the session when the user logs out of the OGTS system.

- **Password Authentication**: The password is encrypted when the account is created. This feature is implemented using MD5 function.

- **Account Lock**: The account of any user is locked if a wrong password is entered three consecutive times at the time of login.

- **Backup**: The database is backed up periodically by the administrator. In the even of failure the data can be restored.

- **HTTPS**: OGTS can be implemented with security sensitive communication with the help of HTTPS protocol. HTTPS uses SSL (Secure Socket Layer) protocol or the TLS (Transport Layer Security) protocol to ensure reasonable protection. HTTPS restricts access to a web-server to only authorized people.
4. TESTING AND EVALUATION

The project was evaluated and debugged at every stage of development. The entity relationships were developed to establish relationship between the tables. During the development of the database care was taken so that, all variables have suitable data types. Entered different data to see if all the conditions were satisfied and then test queries and stored procedures written were continuously checked. The following are the list of tests that were performed on this project.

- Code Testing
- Usability Testing

4.1 Code Testing

The written code is tested for different inputs to verify the output with the expected result. Black Box and White Box test design methods are used for testing the code. Black-box test design treats the system as a "black-box", so it doesn't explicitly use knowledge of the internal structure. Black-box test design is usually described as focusing on testing functional requirements. Black box testing is testing that occurs from the viewpoint of an end user. Black box tests found bugs such as incorrect functions, interface problems, and database errors. Black box tests are also the only form of test the customer is likely to understand. Therefore, black box testing is absolutely mandatory for acceptance testing. The user must be able to understand these tests, so that he/she will know for sure whether or not the contract requirements were met. Black box testing was performed on OGTS. The faculty and students of M. L. Garza Gonzales Charter School was provided with login and password information. They were given specific activities to
see the desired results. A survey was conducted after testing and a brief summary is included in the report. White-box test design allows one to peek inside the "box", and it focuses specifically on using internal knowledge of the software to guide the selection of test data. These methods are used during the test design phase. White box testing is testing from the inside-tests that go in and test the actual program structure. Basis path testing, very simply, test every statement in the program at least once. White box testing was performed on OGTS. All the modules were tested with different types of data and scenarios until the desired output was achieved. The structure of upload assignment feature in teacher’s interface was restructured after white box testing. Initially only the .txt extension files could be uploaded for students. The students viewed it as a link with the entire path of the file location, instead of the title of the assignment with hyper link. In the white box testing the OGTS did not diverge from the intended goals.

4.2 Usability Testing

Online Grading and Tracking System is a Web based system, thus Usability Testing identified usability problems including problems related to the specific skills and expectations of the users. Usability testing helped in developing measures that contributed to users' effectiveness, efficiency and satisfaction. Usability testing is the process by which the human-computer interaction characteristics of a system were measured, and weaknesses were identified for correction. These considerations helped in developing a better system. When the system was ready for the test, a list of tasks that a user should be able to accomplish with the system were formulated and tested with individuals.
The following are the list of events that were tested

- Are the individuals able to accomplish the tasks?
- Time taken to accomplish the task.
- Is the navigation of the Web site simple?
- Satisfaction of the users.
4.2.1 Methodology

There are four different types of users involved in this project. Individuals form each type were chosen to perform for the usability testing. The users were asked to verbalize their thoughts as they performed the tasks. The users were not helped during the testing process. The users were asked for any questions that came up during the usability test. The comments from the users were translated into modifications. And the users were asked for suggestions. A questionnaire was developed with different questions pertaining to usability issues and then they were checked out as the user accomplished their tasks.

1. Dr. Leobardo Cano, Assistant Superintendent, GCCLR

2. Mr. Adolfo Chapa, Principal, GCCLR

3. Mrs. Sandra Stenson, Assistant Principal/Teacher, GCCLR

4. Mr. Daniel Sanchez, Teacher, GCCLR

5. Mr. Sarah Ayala, Student, GCCLR

All the users involved in the usability testing gave positive feedback. They liked the functionality and the fact that they can save a lot of time and paper. All the users were able to accomplish the tasks. The users on average took 30 seconds to finish any given task. Suggestions were made by Dr. Leobardo Cano to keep the Web pages simple and clean. The users expressed high level of satisfaction in using the system.
5. RESULTS AND CONCLUSION

The Online Grading and Tracking System is aimed at helping teachers, principals, and officials in charge of testing to save time and effort in grading and tracking the students. The project helps teachers create lesson plans, create on line assignments and allows teachers to monitor the performance of each student. The Principal and assistant principal can monitor all the teachers and view their lesson plans and track their progress. The OGTS allows the principal and assistant principal to monitor each student performance. The officials in charge of testing in the administrative office have privileges to export data into useable form. This project also plays an important role in helping parents to track their children by allowing them to track their academic progress saving them time and effort. Students can take advantage of online assignments to makeup the work they missed.
6. FUTURE WORK

In the future, the functionality of the OGTS can be expanded by adding more features. There are four different types of users for OGTS and functionality can be expanded for all the users. The students can be provided with functionality to take assignments online. Teachers can be provided with a feature where they can use templates to create assignments and tutorials. The technical responsibilities for principals can be reduced and have administrator in charge. The administrator’s functionality can be expanded to provide online exams and automate the process of creating reports. The OGTS can be expanded by adding a new module to track attendance of students.
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APPENDIX A: Data Dictionary of Online Grading & Tracking System Tables

1. Announcements Table

This table contains the information of the announcements made by the users of OGTS. This table has the following attributes:

- login_id: Represents the login id of the user.
- announce_id: Represents the unique surrogate key.
- view_permission: Represents the permission to view announcements.
- announcement: Represents the announcement for the user.
- announcement_date: Represents the date of announcement.
- level_id: Represents the identity of the user.
- name: Represents the student’s identity to view teacher comments.

*Primary Key: (announce_id)*

*Index: (level_id, login_id)*

2. Assignments Table

This table contains the information of the assignments created by the teacher. This table has the following attributes:

- login_id: Represents the login id of the user.
- assign_id: Represents the unique surrogate key.
- assign: Represents the location of the assignment file.
- assign_date: Represents the day the assignment is created.
- name: Represents the student to whom the assignment is assigned.
- level_id: Represents the identity of the user.
- submitname: Represents the student who submitted assignment
• duedate: Represents the due date of the assignment.

*Primary Key: (assign_id)*

*Index: (login_id)*

3. Courses Table

This table contains the information of the courses assigned to the students. This table has the following attributes:

• courseid: Represents unique surrogate key.
• course_num: Represents the course number.
• course_name: Represents the course name.

*Primary Key: (course_id, course_num)*

4. Grades Table

This table contains the information of the grades of the student. This table has the following attributes:

• login_id: Represents the login id of the user.
• course_num: Represents the course number.
• grade: Represents the class of the student.
• percent: Represents the percentage of the student.
• instructor_id: Represents the name of the instructor assigned to the student.
• semester: Represents the semester of the student.

*Primary Key: (login_id, course_num, semester)*
5. Lesson Plans Table

This table contains the information of lesson plans created by the teacher. This table has the following attributes:

- login_id: Represents the login id of the user.
- lid: Represents the unique surrogate key.
- course_num: Represents the course number.
- lesson_date: Represents the date the lesson plan was created.
- semester: Represents the semester of the lesson plan.
- file: Represents the content of the lesson plan.

Primary Key: (login_id, course_num, semester, lid)

6. Level Table

This table contains the user identification. This table has the following attributes:

- level_id: Represents the unique id to identify users.
- level_position: Represents the category of users.

Primary Key: (level_id)

7. Login Table

This table contains the login and password information of the users. This table has the following attributes:

- login_id: Represents the login id of the user.
- password: Represents the password of the user.
- level_id: Represents the unique id to identify users.

Primary Key: (login_id)
8. Objective Table

This table contains the objectives information created by the principal. This table has the following attributes:

- objid: Represents the unique surrogate key.
- objective: Represents the objectives created by principal.
- course_num: Represents the course number.
- semester: Represents the semester related to objectives.
- obj_date: Represents the day the objective was created.

*Primary Key: (objid)*

9. Tutorials Table

This table contains the tutorial information created by the teachers. This table has the following attributes:

- tid: Represents the unique surrogate key.
- login_id: Represents the login id of the user.
- course_num: Represents the course number.
- semester: Represents the student semester.
- file: Represents the location of the tutorial.
- title: Represents title of the tutorial.
- tutorial_date: Represents the day the tutorial was created.
- name: Represents the assigned student.

*Primary Key: (tid)*

10. Users Table

This table contains the user information. This table has the following attributes:

- login_id: Represents the login id of the user.
- first_name: Represents the first name of the user.
• last_name: Represents the last name of the user.
• email: Represents the email of the user.
• address: Represents address of the user.
• attempts: Represents the unsuccessful login attempts.

*Primary Key: (login_id)*
APPENDIX B: USER REACTION SURVEY FORM

Online Grading & Tracking System (OGTS)

Thank you for visiting OGTS Web Site. Dr. M. L. Garza Gonzales Charter School appreciates your time to tell us what you think about OGTS so that improvements can be made to better suite your need. Please circle the choices after performing the following activities.

Administrator/Principal Activities:

View teacher lesson plans
Create new objectives for teachers.
Delete objective
Create new account.
Make announcement for the teachers.

Teacher Activities:

Create lesson plan
View objectives
Modify student grade
Post assignment
Post student comments

Student Activities:

View tutorials
View Assignment
Submit assignment
Parent Activities:

View progress report

Email teacher

View teacher comments.

1. Did you find the information you wanted?
   A. Yes
   B. No

2. How easy did you find it to navigate?
   A. Very easy
   B. Easy
   C. Average
   D. Hard
   E. Very hard

3. How easy did you find information?
   A. Very easy
   B. Easy
   C. Average
   D. Hard
   E. Very hard

4. How useful did you find the content of the site?
   A. Very useful
   B. Useful
   C. Neither useful nor useless
   D. Somewhat useful
   E. Somewhat useless

5. How likely would you be to return to this site?
   A. Definitely
   B. Not sure
   C. Probably
   D. Probably not
   E. Definitely not
6. What did you like about the site?

________________________________________________________________________

________________________________________________________________________

7. What did you dislike about the site?

________________________________________________________________________

________________________________________________________________________

8. Your contact information (optional)

________________________________________________________________________

________________________________________________________________________
Student Help

**Progress Report:** To view progress report please select “Progress Report” from the student main menu and click the submit button. You can also view the report by clicking “Progress Report” link on menu bar provides on the left hand side of the page. An E-Mail link is provided to send mail to the teacher.

**View Assignments:** Select “Assignments” from the student main menu to view student assignment menu. Select View Assignments” to view the assignments. Assignment posted date, title, due date and teacher information is provided on this page. Click on the title to open/save the assignment. You can view student assignment menu by clicking the “Assignment” link on menu bar provided on the left hand side of the page.

**Upload Assignments:** Select “Assignments” from the student main menu to view student assignment menu. Select “Upload Assignments” to view the assignment upload page. Click browse to select the assignment file from the computer, choose a title for the assignment and the respective teacher. Click submit to upload the assignment to the teacher. You can view student assignment menu by clicking the “Assignment” link on menu bar provided on the left hand side of the page.

**Teacher Comments:** To view teacher comments please select “Teacher Comments” from the student main menu. You can view teacher comments by clicking the “Teacher Comments” link on menu bar provided on the left hand side of the page. The date of the teacher comment and teacher name are provided along with the teacher comments on this page.

**Announcements:** To view school announcements please select “announcements” from the student main menu. You can view school announcements by clicking the “Announcements” link on menu bar provided on the left hand side of the page.

**View Tutorials:** Select “View Tutorials” from the student main menu to view student tutorials. Tutorial posted date, title and teacher information are provided on this page. Click on the title to open/save the tutorial. You can view student tutorial by clicking the “View Tutorials” link on menu bar provided on the left hand side of the page.
**Change Password:** To change the account password please select “Change Password” link provided on menu bar provided on the left hand side of the page.

**E-Mail:** Click Email link on the side menu bar to send email.
Teacher Help

**Grade Book:** To view grade book menu select “Grade Book” from the teacher main menu. Select the grade and enter the instructor id to view the contents of the selected grade. Grade book menu can be viewed by clicking on “Grade Book” link provided on the side menu bar also.

**View Lesson Plans:** To view lesson plans select “View Lesson Plans” from the teacher main menu. You can edit the lesson plans by selecting the “Modify” button for that lesson plan. The lesson plan can be deleted by clicking on the “Delete” button for that lesson plan. Lesson plans can be viewed by clicking on “View Lesson Plans” link provided on the side menu bar also.

**Create Lesson Plans:** To create lesson plans select “Create Lesson Plans” from the teacher main menu. Enter course, semester, lesson plan information and date and click submit. A “View Objective” link is provided next to lesson plan field to view objectives for the courses. Lesson plans can be created by clicking on “Create Lesson Plans” link provided on the side menu bar also.

**Change Password:** To change the account password please select “Change Password” link provided on menu bar provided on the left hand side of the page or select “Change Password” from the teacher main menu.

**View School Announcements:** Select “Announcements” from the teacher main menu to view teacher announcement menu. Select view announcements to view the school announcements. You can view teacher announcement menu by clicking the “Announcements” link on menu bar provided on the left hand side of the page.

**Teacher Comments:** Select “Announcements” from the teacher main menu to view teacher announcement menu. Select “Post Comments” from the teacher announcement menu and then select the student from your class by selecting the name from the drop down menu. Enter the comment and click submit to post the comment for that student. You can view teacher announcement menu by clicking the “Announcements” link on menu bar provided on the left hand side of the page. Teacher comments can be viewed by selecting “Manage Comments” from the teacher announcement menu. A delete button is provided to delete old announcements.

**Post Assignments:** Select “Assignments” from the teacher main menu to view teacher assignment menu. Select “Post Assignments” to view the upload assignments page. Select the student from the drop down list and then give the title of the assignment and due date. Click on the browse button to select assignment file and click submit. You can view teacher assignment menu by clicking the “Assignment” link on menu bar provided on the left hand side of the page.
**Review Assignment**: Select “Announcements” from the teacher main menu to view teacher announcement menu. Select “Review Assignments” from the teacher announcement menu to view the assignments posted by the teacher. A “Delete” button is provided to delete the unwanted assignments. You can view teacher assignment menu by clicking the “Assignment” link on menu bar provided on the left hand side of the page.

**Dropbox**: Select “Announcements” from the teacher main menu to view teacher announcement menu. Select “Dropbox” from the teacher announcement menu to view the assignments submitted by the student. Click on the title to open/save the assignment. You can view teacher assignment menu by clicking the “Assignment” link on menu bar provided on the left hand side of the page.

**Post Tutorials**: Select “Tutorials” from the teacher main menu to view teacher tutorials menu. Select “Post Tutorials” to view the upload tutorials page. Browse the tutorial file from the local computer, and then select the title, course, student name and semester. Click submit button to post the tutorials. You can view teacher tutorials menu by clicking the “Tutorials” link on menu bar provided on the left hand side of the page.

**Review Tutorials**: Select “Tutorials” from the teacher main menu to view teacher tutorials menu. Select “Review Tutorials” to view the assigned tutorials page. A “Delete” button is provided to delete unwanted tutorials. You can view teacher tutorials menu by clicking the “Tutorials” link on menu bar provided on the left hand side of the page.

**E-Mail**: Click Email link on the side menu bar to send email.
Administrators/Principal Help

**Grade Book:** To view grade book menu select “Grade Book” from the administrator/principal main menu. Select the grade and enter the instructor id to view the contents of the selected grade. Grade book menu can be viewed by clicking on “Grade Book” link provided on the side menu bar also.

**View Lesson Plans:** To view lesson plans select “View Lesson Plans” from the administrator/principal main menu. You can edit the lesson plans by selecting the “Modify” button for that lesson plan. The lesson plan can be deleted by clicking on the “Delete” button for that lesson plan. Lesson plans can be viewed by clicking on “View Lesson Plans” link provided on the side menu bar also.

**Create Lesson Plans:** To create lesson plans select “Create Lesson Plans” from the administrator/principal main menu. Enter course, semester, lesson plan information and date and click submit. A “View Objective” link is provided next to lesson plan field to view objectives for the courses. Lesson plans can be created by clicking on “Create Lesson Plans” link provided on the side menu bar also.

**Change Password:** To change the account password please select “Change Password” link provided on menu bar provided on the left hand side of the page or select “Change Password” from the administrator/principal main menu.

**View Objectives:** Select “Objectives” from the administrator/principal main menu to view objectives menu. Select “View Objectives” from the objectives menu to choose a course, then choose the course from the drop down list to view or delete objectives. Objectives menu can be accessed by clicking the “Objectives” link provided on the side menu bar.

**Post Objectives:** Select “Objectives” from the administrator/principal main menu to view objectives menu. Select “Post Objectives” from the objectives menu to post view the ‘Post Objective’ page. Enter the course information and objective information for the semester and click submit to post the objective. Objectives menu can be accessed by clicking the “Objectives” link provided on the side menu bar.

**Update User Accounts:** Select “System Administration” from the administrator/principal main menu to view system administration menu. Choose “Update User Accounts” to modify a user’s account. Select the category from the user accounts menu and click “Submit”. The list of user will be displayed and clicking on the “Modify” button will change the user information. New users can be added by clicking on “New User” button and a user can be deleted by clicking on the “Delete” button. System administration menu can be accessed by clicking the “System Admin” link provided on the side menu bar.
**Assign Students:** Select “System Administration” from the administrator/principal main menu to view system administration menu. Select “Assign Students” to view ‘Assign Student’ page. The list of students will be displayed on this page. Click the “Assign” button to assign teacher and courses. System administration menu can be accessed by clicking the “System Admin” link provided on the side menu bar.

**Class Reports:** Select “System Administration” from the administrator/principal main menu to view system administration menu. Select “Reports” to view ‘reports menu. Select “Class Reports” to view ‘Class Reports Page’. Select grade, course, and teacher to view the class report. System administration menu can be accessed by clicking the “System Admin” link provided on the side menu bar.

**Student Reports:** Select “System Administration” from the administrator/principal main menu to view system administration menu. Select “Reports” to view ‘reports menu. Select “Student Reports” to select the grade and then click submit. A list of students will be displayed for the class. Click on the reports button for a student and it will display the student report card. System administration menu can be accessed by clicking the “System Admin” link provided on the side menu bar.

**Review Lesson Plans:** Select “Review Lesson Plans” from the administrator/principal main menu to view teacher’s lesson plans. Select the teacher and the date range to view lesson plans. Comments can be added to teacher’s lesson plans by clicking the “Comments” button. To review lesson plans a link is also provided on the side menu bar.

**E-Mail:** Click Email link on the side menu bar to send email.