**PLMS: A WEB-BASED LEARNING MANAGEMENT SYSTEM FOR BLENDED LEARNING OF PHILTECH-GMA**

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**INTRODUCTION**

The year 2020 is currently one of the challenging years due to the pandemic and everyone is mostly affected facing this new normal. Tria (2020), stated that in educational sectors the COVID-19 brought challenges for everyone. Despite the challenges the quality of education must sustain and provide quality of education even under the “new normal educational policy”. LMS is a flexible learning platform that can be used even the educational sectors return to normal and use blended learning to improve the learning experience of the students that are limited in the traditional class. According to Dr. Titthasiri (2013), there is no difference between the e-learning and traditional method of classes when it comes to delivering quality education to the students and it is more effective to implement blended learning.

Philtech GMA-Philippine Technological Institute of Science Arts and Trades Central Inc. is a private technical and vocational school located in Maderan, GMA, Cavite that offers Senior High School Grade 11 and Grade 12, with TechVoc Track, Home Economics Food and Beverage Services, Bartending, Cookery, Baking and Pastry, Front Office and Tourism Promotion and founded in June 2011.

Due to the effect of the new normal all of the classes are shifted from traditional to online classes. To sustain the quality of education is a challenging task for instructors. Students also have difficulties in these online classes for the reason that the Philtech-GMA does not have its website or platform where the student and instructors can track all of the academic progress, performance and all learning materials needed by the students that can be access in single platform and monitoring the enrolled subject is challenging for the reason that instructors used different platforms.

This study entitled “PLMS: A WEB-BASED LEARNING MANAGEMENT SYSTEM FOR BLENDED LEARNING OF PHILTECH-GMA” aims to establish a platform where students, instructors, and school registrar can interact and track the academic progress of the students, all the learning materials can be accessed and manage by the instructors, students, and registrar. It also has grading systems using the guidelines of the Department of Education (DepEd) K to 12 grading guidelines where the instructor can evaluate the student performance base on the students’ academic progress and submit grades to the registrar to finalize and distribute the grades to its students. The LMS will be used in blended learning and support the instructors to enhance the student learning that is lacking in traditional classes.

**Objectives of the Study**

The main objective of the study is to develop a web-based Learning Management System for Philtech-GMA that will satisfactorily pass the International Organization Standardization 25010 for software evaluation.

Specifically, it aims to include the following:

1. To have all classes located inside the LMS.

1.1 To provide a classroom where academic performances and records access efficiently every time students need it.

2. To have academic resources manageable and accessible.

2.1 To allow the instructors and students to manage all the academic resources needed accessible and manageable by creating folder and upload the materials.

2.2 Too easily shared all resources inside the system to the classroom or the student directly.

3. To allow instructors to create class activities.

3.1 To allow instructors to upload online questionnaires for the class activities or exams.

3.2 To allow students to take the class activities or exams online or submit manually and check by the instructors.

3.3 To record students' raw scores of taken activities or exams online without checking or checking manually for the submitted records and input raw score.

4. To allow instructors to assess the students' performance.

4.1 To assess students' performance using the DepEd k to 12 transmutation and grading system standards and the finalize grades to be submitted to registrar.

5. To allow the registrar to manage all information inside the system.

5.1 To print the students' grades that are submitted by the instructors.

5.2 To manage the information display inside the academic calendar.

5.3 To manage students' request to create an LMS account verified using the registrar master list.

5.4 To update the Academic year and semester to start new classes.

**Significance of the Study**

The study aims to develop a learning management system that will help the beneficiaries:

**Students .**The Philtech-GMA students’ are the main beneficiaries of the proposed system to enhance the quality of learning. The student will monitor all their enrolled class using the system and gather the necessary information and educational materials needed and track the academic progress.

**Instructors**. The system will help the instructors to monitor student performance and also manage all the learning materials inside the LMS, It will also have a grading system where the instructor can evaluate the student performance and submit the grades of the students to the registrar.

**Registrar.** The registrar will easily to gather the students’ grades that are submitted by the instructors.

**Future Researcher.** Thefuture researchers can use our study as their guide of reference for their own research that is related to the database management system.

**Time and Place of the Study**

The study will be conducted at Philtech-GMA from October 2020 and is expected to be finished on June 2021.

**Scope and Limitation of the Study**

This system aims to provide to the student of Philtech-GMA a system where they can use a platform to gather all their academic resources that the student needed. The system also intended to help Philtech-GMA instructors to implement blended learning. Blended learning will help the instructors to enhance the student learning experience that is limited in the traditional class. The system is only limited to support blended learning and cannot support the video and audio function of class discussion.

All learning materials inside the system are manageable by the students, instructors, or registrar and those materials can be shared with the classroom or the students directly. The resources functionality provides flexibility in creating academic resources by separating the uploaded materials using the folder functionality. The resources functionality can't open the documents file that uploaded directly inside the system.

The system also provides the instructors' functionality where the student can take their academic activities online and raw scores will be recorded. The instructors can input the result manually for the students that submitted the activities in file format. The system cannot check the answer of the students if the uploaded question does not have a specific answer and the instructors must check and give a score manually.

The instructors evaluate the students' performance using the guideline of DepEd k to 12 grading guidelines the raw score of the students will be computed and the passing is 75% and the lowest possible grades are 60% transmutation grades are the final grades of the student that will be submitted to the registrar. The grading system is flexible depending on the subject writing works, performance task percentages grades. The system cannot compute multiple students' grades in one click and need to compute one by one to get the final grades.

The registrar monitor all the students inside the LMS and student request for the approval of account are validated using the master list. the registrar also can manage the information inside the academic calendar. The submitted students' grades will be printed and distribute by the registrar to the students. And after the academic year, the registrar can update the academic year for the opening of the new class year. The registrar doesn't have access to any classroom

**Definition of Terms**

***Operational Terms***

**Administrator** is a person who monitors the attendance of the students inside the classroom.

**DepEd** or Department of Education formulates, plans, implements, and coordinates the policies, plans, programs and projects in the areas of formal and non-formal basic education.

**K to 12** it means from kindergarten to 12th grade.

***Technical Terms***

**API.** Stands for application programming interface, a concept that applies everywhere from command-line tools to enterprise Java code to Ruby on Rails web apps. An API is a way to programmatically interact with a separate software component or resource (Siegel, 2020).

**LMS.** Learning management system is a software application for the administration, documentation, tracking, reporting, automation and delivery of educational courses, training programs, or learning and development programs (Strawser, 2018).

**CodeIgniter**. It is PHP MVC framework that is used for developing web applications rapidly. It provides out of the box libraries for connecting to the database and performing various operations like sending emails, uploading files, managing sessions etc., (Rungta, 2021).

**MySQL**. It is database management system that allows you to manage relational databases. It is open source software backed by Oracle. It means you can use MySQL without paying a dime. Also, if you want, you can change its source code to suit your needs (Dwika, 2020).

**REVIEW OF RELATED LITERATURE**

**Traditional and Blended Learning**

Traditional learning has a weakness the teaching materials cannot be repeated and the discussions have limitations on sharing of knowledge. It also has limited space and time for the student to fully absorb the information. LMS is very feasible to use than traditional learning in terms of LMS usability, functions, communication, learning design, learning contents that will help to increase and satisfaction and quality of learning (Rabiman et al., 2020). To enhance more the quality of the education LMS will substitute the lapses of the traditional classes to meet the student need.

According to Dr. Titthasiri (2013) concluded that the e-learning and traditional method of classes there is no difference when it comes to delivering quality education to the student but the researcher concluded the effectiveness of blended learning using the e-learning and traditional classes. It also a big help for the instructors to have LMS the reason not all academic activities can be done and finish inside the class using the LMS can serve as the extension of the classes that have flexibility in terms of time and place. Blended learning had challenges and opportunities it also offers flexible use of time and resources that will be beneficial for both instructors and the students enhance the teaching process and the quality of the academic performance of the students (Turbany et al., 2014). Both the student and instructor have positive appreciations of the LMS affordance of availability of all academic resources that the students need the flexibility to access all academic resources at any time. But relying fully on e-learning the instructors observed decreased attendance and student participation (Holmes & Prieto-Rodriguez, 2018). Blended learning will be more effective the combined LMS and Traditional method will increase the student academic performance using LMS to gather all learning materials and to supplement the lacking of time and places in traditional classes.

Instructors and student have positive assessments on implementing e-learning for the capability of enhancing the delivery of academic resources that the student needed are also good strategies to adopt these type of teaching for the reason that e-learning is not bounded by school resources and can be extended throughout the area through distance learning and e-learning strategies (Hallar et al., 2020).

According to Tria’ (2020) stated In Educational sectors the COVID-19 brought challenges for everyone. Despite the challenges the quality of education must sustain and provide quality education even under the “new normal educational policy”. The use of LMS will be a great help for the instructors and students in the time of pandemic and the online learning replaced the traditional learning and can supplement the need of the students for sustaining the quality of the students' education. Due to the COVID-19 pandemic, the educational sector worldwide has been interrupted and faces challenges in maintaining educational quality despite those challenges. The practical implication of the e-learning system was needed and to successfully implement the system it must be needed the support of the management, technology knowledge management, utilizing the system to increase the student awareness. It also should be considered in improving the educational process. Also implementing a learning management system and traditional learning (Blended learning) is the most preferred e-learning system (Alqahtani & Rajkhan, 2020). Covid-19 also affected the daily life of the student from traditional classes into online classes and utilizing the LMS will be a great help for both students and instructors in the time of new normal.

This type of learning process will be a great help for the PhilTech instructors and students in the time of COVID-19 Pandemic using the system will maintain the academic quality and all learning materials that the student needed will be easily accessed by the students and also be a great help even the time of educational sectors return to its traditional classes for the reason that the blended class will maximize the time and resources and improves students academic performances.

**Social Media**

Social Media such as Facebook can also be used as a medium for the student and instructors to communicate and sharing learning materials, announcements, and submitting student academic records, however, there are limitations it did not support other files and it must be uploaded directly. The uploaded learning materials are not threaded accordingly, the student also not comfortable for some reason that their privacy might be revealed (Yang et al., 2011). The student and instructors having difficulties monitoring all the learning materials and student-submitted academics records and monitor their academic progress using social media.

**LMS**

LMS has been proven the effectiveness of supporting the learning activities and how the stakeholders adopt and perceive this learning tool. The success of using the LMS is considered how the organizations properly implemented and support the system. The Educator should be the driving force of the innovations so the learner will actively engage in using the LMS to their advantage. (Emelyanova & Voronina, 2014). Implementing LMS also provides a dynamic approach to traditional teaching methods. In order, to LMS successfully implement thru communication (Davis & Surajballi 2014). Philtech learning management system to be implemented successfully the system must be supported by the school organizations, and instructors push to its students of using the system for the blending learning.

LMS can enhance the quality of educations and offers wide ranges of academic approach to its students. The functionality, materials relevance, feasibility, usability, and attractiveness had a great impact on the instructors and students. The learning management system (Edmodo System) had a positive impact on the student and increased the academic performances (Hidayat, & Syaad, 2018). To ensure the quality of the LMS and sustain the quality of education the University and college should evaluate the LMS and the content of the system to ensure that the system meets the requirements and demands of the institutions (Pasquini et al., 2013). The Internet and intranet have brought about many changes in instructor and student interactions. This has enabled the communication process to change; the instructor does not have to communicate to the students only in the classrooms. (Wang, 2017). Using the internet to gather all reassures and upload inside the LMS for creating quality content of learning materials.

G**rading System**

It is easy to understand that the learning process is complex, messy, and difficult to summarize with just one letter. Letter grades are the norm in many schools and colleges. Even parents expect some kind of regular feedback for student progress (Smith & Laften, 2017). LMS does this job for the students since they upload essays, assignments, and take quizzes online. The instructors can evaluate the student performance students Grades will appear in the grade book so you won’t have missing papers. The instructors can leave feedback. In this way, students can revisit the comments and use them to improve future work. Some instructors use pop quizzes throughout the semester to measure the learning of the students (Rymer, 2018). The system intended to show the students the academic progress they made and display the result of academic performances.

Instructors can also create rubrics based on different assignments to grade faster. Some consider the grade letter system to be outdated by now and have stopped using it. An LMS can provide the option to create custom grading scales that are more suitable. Plus, an LMS offers flexible options such as non-graded assessments. With the help of competency-based learning, you can see how well students are acquiring knowledge and skills (Matta et al., 2015). These are also the problems identified by the researchers at PhilTech-GMA. However, they focused more on the problems in grading and monitoring of the students. They ought to resolve the issue of identifying instructors who are grading their classes with the use of the developed system.

While a limited or more traditional interpretation of effective classroom management may focus largely on compliance rules and strategies that teachers may use to make sure students are sitting in their seats, following directions, listening attentively, and more encompassing or updated view of classroom monitoring extends to everything that teachers may do to facilitate or improve student learning, which would include such factors as behavior a positive attitude, happy facial expressions, encouraging statements, the respectful and fair treatment of students, well classroom filled with intellectually stimulating learning materials that are organized to support specific learning activities. The specific techniques used to manage classrooms and facilitate learning can vary widely in terminology, purpose, and execution (Ramos et al., 2015).

The grading system will use the standard guidelines implemented by DepEd K to 12 where student academic performance will be assessed base on the result of their raw score where the passing grade is 60 and transmuted to 75 in the grading system (Lliego, 2020).

**LMS Learning Materials**

According to Adzharuddin (2013) The learning management system (LMS) has been already used in a number of universities worldwide to make it easier for the students and lecturers to reach out to one another without being confines of the traditional classroom. The instructors can easily update the learning materials even out of the class hour. It is designed to manage all learning materials and deliver the resources to students.

The aim of LMS is to manage all online content such as the learning materials that the student needed it also increases student learning for the reason that the LMS can be easily accessed all learning materials. It also enhances student motivation, encourages the students, and allows the instructors to create activities and meets the students' needs (Yiğit et al., 2015). The internet has brought a whole range of possibilities to offer the users a dynamic and interactive learning experience that will enhance them to achieve their goals and reach their greatest potential. It contributes to the development and strengthening of the digital skills of the students and instructors. The students can take the courses with the consultation of admission and for approval that can take these courses (Magdin et al., 2012). Instructors can use it to make their lessons more interesting and engaging. The importance of the Internet for students that it makes it easier to research things, as well as fact-check the information that is taught in colleges and universities (Yang et al., 2015).

The ability of LMS to manage and archiving the records, flexible communication, and modern assessment tools for the instructors will lead to more institutions on relying using LMS (Dobre, 2014). Using the grading system will help the LMS system to evaluate the student progress.

There is great potential in implementing the LMS and it is more highlighted due to the effect of the pandemic, Education should not stop even facing the great challenges due to the COVID-19, we must rely on e-learning to bring the needs of the student in quality education and learning materials using the LMS. It will also be a great start-up for PhilTech-GMA to utilizing LMS if the time educational sectors return in implement traditional method blended learning will be great for students to supplement the lacking teaching on the traditional method. Utilizing the grading system the registrar distribution of grades using LMS will broader their options in times of pandemic that the face-to-face transaction will be limit.

**METHODOLOGY**

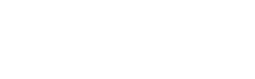
**Materials**

For the developing of the system, the following software was used *Sublime Text 3* for the text editor; *PHP Hypertext Preprocessor* for the programming language; *My Structured Query Language (MySQL)* for the database; and *XAMPP* for the server and *Codeigniter 3.1.11* for the framework.

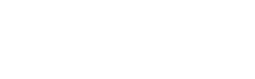
The following system specifications of the hardware will used: a personal computer have the following specifications: *Intel Pentium N3540 processor at 2.16 gigahertz (GHz)* of clock speed, *1.9 gigabyte (GB) of double data rate 3 (DDR3) Random Access Memory (RAM),* *500 gigabyte (GB)* of hard disk, and installed *Windows 8 64-bit operating system (OS).*

**Method**

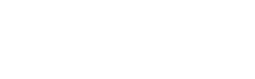
The development system cycle modified waterfall model method (Pohjala*.,* 2011). Waterfall model consists of 6 phases: collection of requirements, analysis, program design, coding, testing and maintenance (Fig. 1). The model focuses in systematic grading progression between different phases. Each phase consists of set activities that must be accomplished and before going to the next phase. Once the phase completed, the next one may begin and so on. The output of previous phase serves as an input for the following phase. This waterfall model is allowing the proponents to return at the previous phase just in case of problem was encountered (Pohjala*,* 2011).



Requirements

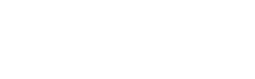


Analysis

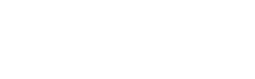


Program

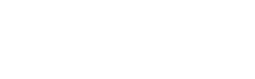
Design



Coding



Testing



Operations

Collection of

Figure 1. Modified Waterfall Model (Pohjala, 2011) adapted from Royce (1970)

**Collection of Requirements.** This phase of primary goals in a proficiency-based grading system towards accurately reflect to the students of learning progress and achievement The purpose is to identify specific requirements needed for the system, an interview was conducted with the property custodian of the school. An interview sheet shown in (Appendix 1) was formulated to obtain a deeper understanding of the processes involved and to know the needs of the client as well as the problem that they are facing in their process.

The proponents proposed the system that job is to establish the performance since the students upload their essays, take quizzes online or in traditional class and fairly communicate learning progress. Based on the gathered data, the proponents found out that the manual process of taking the grades of student is done by a administrator as shown in the Input-Process-Output (IPO) diagram (Fig. 2).

**Analysis.** At this phase, all of the gathered data and information that are required in developing the grading system had been reviewed.

**INPUT PROCESS OUTPUT**

1. Records Student grades in excel.
2. Face to Face distribution of grades.
3. Downloading academic resources using social media.
4. Submit student grades to registrar
5. Upload learning Materials using social media and other platform.
6. Evaluate student academic performance
7. Student grades input in excel.
8. Academic Resources.
9. Student Submitted academic records assignment etc,.
10. Student Master list in excel

Figure 2. IPO diagram of the manual process

The manual process of grade recording the student encountered problems and it affects the whole school. There is an instructor assigned to manually check the grade of the students. One of the main problems is the time consumed when the instructor is recording the grades of students in the handbook to write and compute manually of their performance activities and submit to the registrar for the recording and distribution of students grades once the period end.

Another IPO diagram (Fig. 3) was drawn which shows the new process of taking grade recording using the proposed system.

**INPUT PROCESS OUTPUT**

1. Academic resources located in LMS and accessible to student.
2. Student grades inside the LMS are recorded using the grading system.
3. Distributions of grades using LMS.
4. Evaluation of student performance using the grading system and submit to registrar.
5. Monitoring of students LMS registration that are subject for approval
6. Content management of learning materials.
7. Student Master list
8. Academic Resources
9. Student Submitted Academic Records such as Assignment, etc,.
10. Student academic records such as attendance grades, class participation grade and other records.

Feedback

Figure 3. IPO diagram of the PLMS: A web-base learning management system for blended learning of PhilTech-GMA

The proponents also gathered information by reading local and international books, journals, related studies and textbooks in order to gain more knowledge about grade recording of the student.

**Program Design.** This phase consists of defining the software design, component, modules, interface and data to satisfy specified requirements. This phase shows several diagrams that will be outlined before proceeding to the implementation phase. The identified tools used to develop the system are as follows PHP: Hypertext preprocessorfor the programming language, MY Structured Query Language (MYSQL) for the database. The Entity Relationship Diagram as shown in (Fig. 4) presents the design of the system’s database as well as the relationship of one table to another.

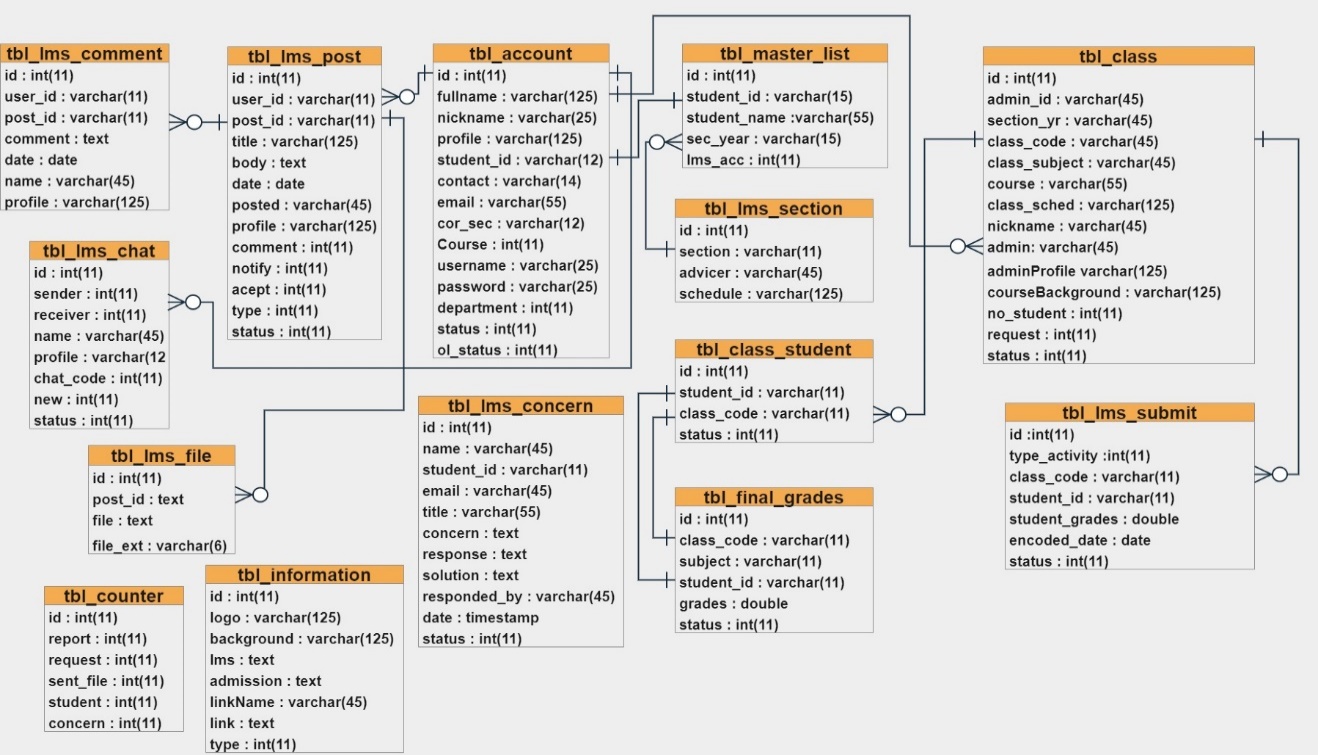


Figure 4. Entity Relationship Diagram (ERD) of the proposed system.

The Entity Relationship Diagram (ERD) is a graphical representation that shows relationships among the components within an information technology system (Rouse, n.d.). Figure 4 depicts the relation between each of the tables within the database by using connectors. The or “one-to-one or many”, indicates that one data from a table can handle many data in another table. There are 13 tables within the database namely db\_lms, tbl\_account use for storing data about the system user to ensure the security of every user, tbl\_master\_list which keep all records of student and monitor if they have account on LMS, tbl\_lms\_section for management of student per section and schedule, tbl\_class where the admin can create own lms classroom, tbl\_class\_student where connected to tbl\_class to manage all student who can enter the class, tbl\_lms\_submit to monitor the student performance, tbl\_final\_grades to record the final grades of student, tbl\_lms\_post for posting announcement, resources to lms wall or class wall connected to tbl\_lms\_comment and tbl\_files, tbl\_lms\_concern to records all the concern of student and documentation of the action taken, tbl\_information where all the information of the Philtech-GMA, and tbl\_counter or the notification (Fig. 5) illustrates the various ways of interaction of the users to the system.

**PLMS: A WEB-BASED LEARNING MANAGEMENT SYSTEM FOR BLENDED LEARNING OF PHILTECH-GMA**

Registrar

Instructors

Students

Figure 5. Use Case Diagram of the PLMS: A web-base learning management system for PhilTech-GMA

**Coding.** In this phase, the proposed of the system will began. The different tools that have been discussed in the design phase were used. During this phase, the system will be developed and acquired based on the detailed design specification that were reflected in the previous phases. The objective of this phase is to ensure that the system functions as expected. After drafting the modules and interface of the system, the coding of the system will be done. The coding of the system will be based on the objectives of the study.

**Testing.** After finishing the coding phase, the proposed system had been assessed by the target client. Evaluation was performed for the system to determine the errors, suggest revisions, and add features that are useful to the users. The target client was also evaluated the system to determine if the system meets the objectives. This phase includes unit testing, system testing and acceptance testing where the equality of each module was test.

***Unit testing***. The proponents will test and check each modules to detect errors and bugs that can take action and debugged as much as possible. Those all modules will be tested and functioning as intended and whether satisfied to the objective of the study.

The proponents will perform a test including the log-in session, student registration, update profile information, create classroom, view monitoring student that submitted their activity, and graded of instructors.

***System testing.*** The proponents perform an evaluation used questionnaire (Appendix 2) adopted from the International Organization for Standardization (ISO) 25010. The criteria are: functional suitability, performance efficiency, compatibility, usability, maintainability, reliability, security, and portability.

The functional suitability criterion (indicators 1 to 3) includes all the function of the system namely: LMS login session module, student registration module, submitted activity files module and create classroom module.

The performance efficiency criterion (indicators 4 to 6) will determine if the proposed system can perform the large number of user with 300 accessible and can handle large amount of data.

The compatibility criterion (indicators 7) will determines if the proposed system can perform by its required function and can sharing a common environment, resources without detrimental impact.

The usability criterion (indicators 8 to 18) will determines if the proposed system can still be used the by specified users and achieve the specified needs with its user interface, operability, and accessibility in a specified context of use.

The maintainability criterion (indicators 19 to 21) will determines the proposed system can easily modified, reused another module and tested.

The reliability criterion (indicators 22 to 24) will determines the proposed system can performs specified functions under specified conditions for a specified period.

The security criterion (indicators 25 to 27) will determines the proposed system protects information and data, confidentiality and authenticity. This also ensures that the users of the developed system will only be accessed by those authorize.

The portability criterion (indicators 28) will determines the proposed system can be change and operate in different platform. This criterion will identify if the system can be compatible to different browsers such as Google Chrome, Mozilla Firefox, Internet Explorer, UC Browser, Opera Mini, and Edge.

***Acceptance testing.*** The proponents identified whether if the client will satisfy and need to validate the system or something changes according of needs and the following criteria are: effectiveness, perform efficiency, satisfaction, freedom form risk, and context coverage.

The effectiveness criterion (indicators 1 to 3) will determines that allow to create or register a new account of the user; the system will allow to the identification which username and password that encrypted to the database; the system will allow the user to login; the administrator will allow to monitor the registered user; instructor will allow to monitor the student that enrolled to their subject and the system will allow the instructor to create classroom for per subjects that attended of student.

The perform efficiency criterion (indicators 4 to 5) will determines that the system performing various task such as: accessed by a large number of users and handle a large amount information of data.

The satisfaction criterion (indicators 6 to 9) this determines that the system achieved its realistic goals, including the results of use and the consequences of use; the system works well based on its functions; and the user feels satisfied when he/she finished his/her task through the use of the developed system.

The freedom form risk criterion (indicators 10 to 12) this determines that the system promotes and builds good reputation to the client by providing accurate information; the system promotes data privacy by allowing users to only accessed the functions and files applicable to their level of accessibility; and it is ensured that the processes involved in the system are based on the client’s transactions.

The context coverage criterion (indicators 13 to 14) will determines that the system can be used with effectiveness, efficiency, freedom from risk and satisfaction in all the specified contexts beyond those initially specified in the requirements.

A total of 30 respondents evaluated the proposed system which is composed of the school instructors and students of Philippine Technological Institute of Science Arts and Trade (Philtech) – General Mariano Alvarez, Cavite. The researchers used convenience sampling technique. It is a type of non-probability sampling method that relies on data collection from population members who are conveniently available to participate in the study. The sampling technique was used because data collection can be facilitated in short duration of time (Trochim, 2020).

The system was rated by the respondents from 1 to 5 where 1 means poor, 2 means fair, 3 means satisfactory, 4 means very satisfactory and 5 means outstanding.

The weighted mean of each indicator was also computed using the formula of BYJU’s. (2016)

∑x

x =

N

where:

x = the mean

x = the score

N = the number of respondents

The researchers also computed for the standard deviation using the formula:

Standard deviation is the

where:

∑ = the sum of

x = the weights

= the mean

n = the value

The results were then interpreted as shown in Table 1.

Table 1. Interpretation of mean ratings (Bicol University, 2012)

**WEIGHT RANGE DESCRIPTIVE INTERPRETATION**

4.21 – 5.00 Outstanding

3.41 – 4.20 Very Satisfactory

2.61 – 3.40 Satisfactory

1.81 – 2.60 Fair

1.00 – 1.80 Poor

**Operations.** At the final phase of the system wherein the proposed system will be implemented by the proponents of the client. User manual will also be provided for the user of the system to avoid problem or confusion during the transition of manual process to actual facings. These are all agreed to be prepared for the span of the agreed time covered only. Lastly, upon the implementation of the system, it is expected that the different problems that the system may encounter in the future will be fixed.

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**APPENDICES**

**Appendix 1**

Interview Sheet

Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Position: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Date: \_\_\_\_\_

1. How the instructors of PhilTech GMA distribute the student academic materials?

*-Our instructors used such as fb and google classroom to distribute learning materials to the students.*

*-Instructor also distribute learning materials using softcopy or photocopy*

1. How the students gather their academic resources and how they submit it to its instructor?

-t*he student gather their academic resources that are uploaded in Facebook or Google Classroom and check our post inside the facebook page.*

*-They also copy using flashdrive or their mobile phone also photocopy*

1. How the instructors evaluate the students performance?

-*We do not have grading system as of now and our instructor submit the students grades in excel form and we the registrar will finalize the grades and this grading system is needed to make easier for us to evaluate and process the grades of our students.*

*-The student grades are given to the student upon finalizing their clearance.*

1. What are the steps by steps procedure on evaluating the student grades?

-*Our instructor evaluate the student submitted files and recorded in to their excel grading sheet after that at the end of class year or semester submit it to us registrar and we finalize the student grades because some of the students grades are needed to finalize or needed to complete for them to pass.*

1. Would it be a great help for the instructor to evaluate the student academic performance using the LMS grading system of the proposed system?

*-Yes the system will be great help for the students and instructors to have single website where our student can get their learning materials and track their academic performance*

*-The grading system is what we are needed to reduce the process of student grades and to avoid also the lost of student files for example printed files.*

**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

Signature of Interviewee

**Appendix 2**

Code Snippet

public function chat\_message(){

$data = $this->input->post('code');

$field = "chat\_code";

$table = "tbl\_lms\_msg";

$data=$this->model\_users->data3($data,$field,$table);

echo json\_encode($data);

}

public function user\_chat\_sent(){

$data=$this->model\_users->user\_sent();

echo json\_encode($data);

}

public function user\_chat(){

$data = $this->input->post('id');

$field = "id";

$table = "tbl\_account";

$data=$this->model\_users->data3($data,$field,$table);

echo json\_encode($data);

}

public function chat\_user(){

$data=$this->model\_users->chat\_user();

echo json\_encode($data);

}

public function ajax\_reports(){

$data=$this->model\_users->ajax\_reports();

echo json\_encode($data);

}

public function ajax\_report\_detail(){

$data=$this->model\_users->ajax\_report\_detail();

echo json\_encode($data);

}

//display specific data of report information

public function ajax\_detail(){

$data=$this->model\_users->ajax\_display\_data();

echo json\_encode($data);

}

//reply kay reports

public function ajax\_sent\_response(){

$data=$this->model\_users->ajax\_replay\_report();

echo json\_encode($data);

}

//solve na ang problem

public function ajax\_solve\_reports(){

$data=$this->model\_users->ajax\_solve\_report();

echo json\_encode($data);

}

//save and records ng solution taken

public function ajax\_save\_solution(){

$data=$this->model\_users->ajax\_save\_solution();

echo json\_encode($data);

}

public function ajax\_history\_reports(){

$data=$this->model\_users->ajax\_history\_reports();

echo json\_encode($data);

}

public function ajax\_latest\_activity(){

$data=$this->model\_users->ajax\_latest\_activity();

echo json\_encode($data);

}

public function ajax\_online\_personel(){

$data=$this->model\_users->ajax\_online\_personel();

echo json\_encode($data);

}

public function ajax\_all(){

$data=$this->model\_users->ajax\_all\_person();

echo json\_encode($data);

}

**Appendix 3**

Evaluation for Unit Testing



Republic of the Philippines

**CAVITE STATE UNIVERSITY**

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**PLMS: A WEB-BASED LEARNING MANAGEMENT SYSTEM FOR BLENDED LEARNING OF PHILTECH-GMA**

|  |  |  |  |
| --- | --- | --- | --- |
| **CRITERION**  **Modules** | **DESCRIPTION** | **TESTING** | **REMARK** |
| **User, Admin and Registrar Login and Session** | **First Test**  Login user account, admin or instructor account and registrar account in one login pages and redirect into the according parts of the system. |  |
| **Accounts registration and Profile account** | **First Test**  All registration request will validated using the master list upload.  Profile account update information |  |
| **Instructors Monitoring Student Academic Perfornance** | **First Test**  Registrar can view inside the classroom.  Monitoring of student submitted files per class activity and graded the student performance. |  |
| **Create classroom and approve and reject all request** | **First Test**  Create classroom and student will request to join the class and the instructor will approve or reject the request of the student. |  |
| **Instructors will post learning materials that will be available to its students.** | **First Test**  Upload learning materials that will accessible by the student inside the class. |  |
| **Chat box** | **First Test**  Classroom chat box will try to chat and on time update for both user.  Instructor and Registrar chat box |  |
| **Security** | **Database** | **First Test**  The proponents will try to log-in other account that is not registered or approve in the database. |  |
| **Sessions**  **Google Chrome**  The proponents use test the system capability on other platforms. | **First Test**  Trying to access other parts of the system that are not intended for the sessions.  **First Test**  The proponents will open the system in a web browser to see the GUI and the functions of the system. |  |
| **Platform** |
| **Microsoft Edge**  The proponents use test the system capability on other platforms. | **First Test**  The proponents will open the system in a web browser to see the GUI and the functions of the system. |  |
| **Mozilla Firefox**  The proponents use test the system capability on other platforms. | **First Test**  The proponents will open the system in a web browser to see the GUI and the functions of the system. |  |

Prepared by:

Mark Angelo A. Terante

Jason M. Valguna

**Appendix 4**



Evaluation Form for System Testing

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|  |
| --- |
| Dear Participant,  Good day! We are currently conducting a research entitled “**PLMS: A WEB-BASED LEARNING MANAGEMENT SYSTEM FOR BLENDED LEARNING OF PHILTECH-GMA**”. In line with this, We are respectfully seeking for your assistance to fill out this evaluation form. It will not be a problem if you wish not to participate but your responses will highly be valued. The evaluation form can be completed anonymously. Responses from completed questionnaires will be collated for analysis; once this is complete, the original questionnaires will be kept electronically. Rest assured that all information indicated therein will be treated with utmost confidentiality under the Data Privacy Law of 2012 and strictly be used for the above purpose only. All the gathered information/data will also be retained to the system and will be used as a part of the historical data for further analysis. If you wish to learn more about the results of the research please send an email to **jesonvalguna@gmail.com**.    We are hoping for your kind consideration and support. Thank you very much. |

**NAME:** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ **DATE:** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**DESIGNATION**: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ **SEX:** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**INSTITUTION:** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ **SIGNATURE:** \_\_\_\_\_\_\_\_

**Rate the following statement. Check (✓) the number that corresponds to the degree of your answer. Please be guided with the following scales:**

***1 – Poor 2 – Fair 3 – Satisfactory 4 – Very Satisfactory 5 – Outstanding***

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **INDICATOR** | | **RATING** | | | | | | | | |
| **1** | **2** | | **3** | | **4** | | **5** | |
| **Functional Suitability** | |  |  | |  | |  | |  | |
| 1. The system has the following modules: | |  | | | | | | | | |
| 1. LMS login and session for all users. | |  |  | |  | |  | |  | |
| 1. Student Registration. | |  |  | |  | |  | |  | |
| 1. Update profile information. | |  |  | |  | |  | |  | |
| 1. Monitor all student submitted files according to the activity and input grades. | |  |  | |  | |  | |  | |
| 1. Create classroom. With Class chat box | |  |  | |  | |  | |  | |
| 1. Instructor Create or Upload learning materials | |  |  | |  | |  | |  | |
| 1. Grading system | |  |  | |  | |  | |  | |
| 2. The system can be used to: | |  | | | | | | | | |
| 1. Access the intended session per users, instructor and registrar. | |  |  | |  | |  | |  | |
| 1. The student registration will be validating using the master list of the registrar. | |  |  | |  | |  | |  | |
| 1. Update information such username, password, profile picture, email and contact information. | |  |  | |  | |  | |  | |
| 1. Student can monitor all the submitted activity they submitted in lms classroom and view the activity that the instructor posted. | |  |  | |  | |  | |  | |
| 1. All posted activity will be also posted in class wall and student and instructor can used the comment box. | |  |  | |  | |  | |  | |
| 1. Instructor can create class and allowing or reject the student request to join the class. | |  |  | |  | |  | |  | |
| 1. Uploading of learning materials inside the classroom | |  |  | |  | |  | |  | |
| 1. Class chat box inside the class room | |  |  | |  | |  | |  | |
| 1. Submitted files of student will be graded | |  |  | |  | |  | |  | |
| 1. Evaluate students performance grades using DepEd k to 12 guidelines and submit to registrar. | |  |  | |  | |  | |  | |
| 1. Registrar finalize grades submitted by the instructor | |  |  | |  | |  | |  | |
| 1. Registrar upload master list of students using excel | |  |  | |  | |  | |  | |
| 1. Students submit file and will be graded and recorded by instructors. | |  |  | |  | |  | |  | |
| 3. The System can generate: | |  |  | |  | |  | |  | |
| 1. Generate PDF file for student grades. | |  |  | |  | |  | |  | |
| **Performance Efficiency** | |  | | | | | | | | |
| 4. The system has acceptable level of performance when being  Accessed by a large number of users (300 users). | |  |  | |  | |  | |  | |
| 5. The system provides an appropriate response time (0.7 second) when performing various task. | |  |  | |  | |  | |  | |
| 6. The system can handle large amount of data/information. | |  |  | |  | |  | |  | |
| **Compatibility** | | | | | | | | | | |
| 7. The system can perform its required functions efficiently while sharing a common environment and resources with other products, without detrimental impact. | |  |  | |  | |  | |  | |
| **Usability** | | | | | | | | | | |
| 8. The system used consistent terms. | |  |  | |  | |  | |  | |
| 9. The system has a consistent layout or user interface. | |  |  | |  | |  | |  | |
| 10. The system has a consistent position on screen for error messaging. | |  |  | |  | |  | |  | |
| 11. The system used unambiguous title for function buttons. | |  |  | |  | |  | |  | |
| 12. The command buttons are easy to remember. | |  |  | |  | |  | |  | |
| 13. The system uses helpful messages on screen. | |  |  | |  | |  | |  | |
| 14. The system was easy to operate based on the transaction procedure. | |  |  | |  | |  | |  | |
| 15. The required information are easy to locate. | |  |  | |  | |  | |  | |
| 16. The system responds to invalid input. | |  |  | |  | |  | |  | |
| 17. The interface looks good. | |  |  | |  | |  | |  | |
| 18. The system accessibility varies on the user’s designation. | |  |  | |  | |  | |  | |
| **Maintainability** | | | | | | | | | | |
| 19. The system can be modified using its content management feature. |  | | |  | |  | |  | |  | |
| 20. The data/information in one module can be reused by another module. |  | | |  | |  | |  | |  | |
| 21. The system can be easily tested. |  | | |  | |  | |  | |  | |
| **Reliability** | | | | | | | | | | |
| 22. The account’s username and password are encrypted when it was saved in the database. | |  |  | |  | |  | |  | |
| 23. The system is accessible to all users. | |  |  | |  | |  | |  | |
| 24. The system is capable of handling errors. | |  |  | |  | |  | |  | |
| **Security** | | | | | | | | | | |
| 25. The data inside the system can only be viewed by its administrator. | |  |  | |  | |  | |  | |
| 26. The system provides identification and authentication of system users through the use of username and password. | |  |  | |  | |  | |  | |
| 27. The system can differentiate the registrar, instructor and users in terms of access level during login process. | |  |  | |  | |  | |  | |
| **Portability** | | | | | | | | | | |
| 28. The system can be moved to different environments such as: | |  | | | | | | | | |
| 1. Google Chrome | |  |  | |  | |  | |  | |
| 1. Mozilla Firefox | |  |  | |  | |  | |  | |
| 1. Internet Explorer | |  |  | |  | |  | |  | |
| 1. UC Browser | |  |  | |  | |  | |  | |
| 1. Opera Mini | |  |  | |  | |  | |  | |
| 1. Microsoft Edge | |  |  | |  | |  | |  | |
| *Adapted from the International Organization for Standardization (ISO) 25010 for product quality* | | | | | | | | | | |

Prepared by:

**MARK ANGELO A. TERANTE**

**JASON M. VAGLUNA**Researchers

**Appendix 5**



Evaluation Form for Acceptance Testing

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|  |
| --- |
| Dear Participant,  Good day! We are currently conducting a research entitled **” PLMS: A WEB-BASED LEARNING MANAGEMENT SYSTEM FOR BLENDED LEARNING OF PHILTECH-GMA**”. In line with this, We are respectfully seeking for your assistance to fill out this evaluation form. It will not be a problem if you wish not to participate but your responses will highly be valued. The evaluation form can be completed anonymously. Responses from completed questionnaires will be collated for analysis; once this is complete, the original questionnaires will be kept electronically. Rest assured that all information indicated therein will be treated with utmost confidentiality under the Data Privacy Law of 2012 and strictly be used for the above purpose only. All the gathered information/data will also be retained to the system and will be used as a part of the historical data for further analysis. If you wish to learn more about the results of the research please send an email to **jesonvalguna@gmail.com**.  We are hoping for your kind consideration and support. Thank you very much. |

**NAME:** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ **DATE:** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**DESIGNATION**: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ **SEX:** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**INSTITUTION:** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ **SIGNATURE:** \_\_\_\_\_\_\_\_

**Rate the following statement. Check (✓) the number that corresponds to the degree of your answer. Please be guided with the following scales:**

***1 – Poor 2 – Fair 3 – Satisfactory 4 – Very Satisfactory 5 – Outstanding***

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **INDICATOR** | **RATING** | | | | |
| **1** | **2** | **3** | **4** | **5** |
| **Effectiveness** |  | | | | |
| 1. The system has the following modules: |  |  |  |  |  |
| 1. LMS login and session for all users. |  |  |  |  |  |
| 1. Student Registration. |  |  |  |  |  |
| 1. Update profile information. |  |  |  |  |  |
| 1. Monitor all student submitted files according to the activity and input grades. |  |  |  |  |  |
| 1. Create classroom. With Class chat box |  |  |  |  |  |
| 1. Instructor Create or Upload learning materials |  |  |  |  |  |
| 1. Grading system |  |  |  |  |  |
| 2. The system can be used to: |  | | | | |
| 1. Access the intended session per users, instructor and registrar. |  |  |  |  |  |
| 1. The student registration will be validating using the master list of the registrar. |  |  |  |  |  |
| 1. Update information such username, password, profile picture, email and contact information. |  |  |  |  |  |
| 1. Student can monitor all the submitted activity they submitted in lms classroom and view the activity that the instructor posted. |  |  |  |  |  |
| 1. All posted activity will be also posted in class wall and student and instructor can used the comment box. |  |  |  |  |  |
| 1. Instructor can create class and allowing or reject the student request to join the class. |  |  |  |  |  |
| 1. Uploading of learning materials inside the classroom |  |  |  |  |  |
| 1. Class chat box inside the class room |  |  |  |  |  |
| 1. Submitted files of student will be graded |  |  |  |  |  |
| 1. Evaluate students performance grades using DepEd k to 12 guidelines and submit to registrar. |  |  |  |  |  |
| 1. Registrar finalize grades submitted by the instructor |  |  |  |  |  |
| 1. Registrar upload master list of students using excel |  |  |  |  |  |
| 1. Students submit file and will be graded and recorded by instructors. |  |  |  |  |  |
| 1. Access the intended session per users, instructor and registrar. |  |  |  |  |  |
| 3. The function of the system corresponds to its previously set objectives. |  |  |  |  |  |
| **Performance Efficiency** | | | | | |
| 4. The system has an acceptable level of performance when being accessed by a large number of users. |  |  |  |  |  |
| 5. The system can handle large amount of information (*at least 100 gigabytes*). |  |  |  |  |  |
| **Satisfaction** |  |  |  |  |  |
| 6. The system achieved its realistic goals, including the results of use and the consequences of use. |  |  |  |  |  |
| 7. The system works well based on its functions. |  |  |  |  |  |
| 8. The user feels satisfied when he/she finished his/her task through the use of the developed system. |  |  |  |  |  |
| 9. The user feel satisfied on the totality of the developed system. |  |  |  |  |  |
| **Freedom form Risk** |  |  |  |  |  |
| 10. The system promotes and builds good reputation to the client by providing accurate information. |  |  |  |  |  |
| 11. The system promotes data privacy by allowing users to only access the functions and files applicable to their level of accessibility. |  |  |  |  |  |
| 12. It is ensured that the processes involved in the system are based on the client’s transactions. |  |  |  |  |  |
| **Context Coverage** |  |  |  |  |  |
| 13. The system can be used with effectiveness, efficiency, freedom from risk and satisfaction in all the specified contexts of use. |  |  |  |  |  |
| 14. The system can be used with effectiveness, efficiency, freedom from risk and satisfaction in contexts beyond those initially specified in the requirements |  |  |  |  |  |
| *Adapted from the International Organization for Standardization (ISO) 25010 for quality in use* | | | | | |

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