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K-12 Multiplatform Gradebook Application

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Abstract *- K-12 Multiplatform Gradebook Application is an automated grading system that can be accessed in computer platform for grading process and mobile platform for viewing of class record. Specifically, the study attained the following objectives: (1) To determine a framework to develop the k-12 multi-platform gradebook application; and (2) To determine the level of usability and the acceptability of the proposed K-12 multiplatform gradebook application.*

The study was conducted through descriptive and developmental research design. An iterative and incremental development model was used in determining the framework and in developing the system.

The developed system was determined very usable with the overall computed mean of 4.88 which was evaluated by 5 IT experts. It was also determined as acceptable with the overall tabulated mean of 4.50 that was evaluated by 139 high school teachers and 2 DepEd supervisors.

Keywords: Gradebook Application, K-12, Multiplatform Gradebook

I. INTRODUCTION

Computer technology has become an essential tool for easier and faster way of recording information. It can store, organize, and manage voluminous data. Computers served as efficient data storage systems and excellent information processors. With the advent of technology, having a computerized grading system would make the task of recording and computing of grades easier for the teachers.

Grading System in education is a system that is used to compute and analyzed the educational performance and skills of students which is entirely based upon points alone. There are many types of grading system available now. Right from providing an O grade to A grade, to providing a 'pass' or 'fail' alone, many standard based grading systems are incorporated in various schools across the globe according to their own needs and desires.

At Hudsonville Public Schools, Michigan, United States, letter grade is used in grading system implemented last 2015, wherein A is the highest with a numerical range of 93-100, and E is the lowest with an equivalence of 0-59.

In the Philippines, the last country in Asia that implemented the K-12 Grading System is used in assessing student's performance and skills. K-12 Program or the Basic Education Curriculum covers 13 years of basic education from kindergarten to grade 12 with a level of elementary, junior high school, and senior high school. The Department of Education (DepEd), the executive department of Philippine government that managed and governed Philippine system of basic education, implemented the K to 12 Enhanced Basic Education Program based from DepEd Order No.8. series of 2015 or also known as the Policy Guidelines of Classroom Assessment. From the said policy, it uses a standard and competency-based grading system wherein all grades will be based on the weighted raw score of the learners' summative assessment. There will be a standard grade of 60, which is equivalent to 75 in order to pass a specific learning area.

By using technology in grading system, DepEd provides Electronic Class Record (ECR)

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or also known as E-class record which is used for grading process consistent with the said policy guidelines. The primary purpose of the E-class record is to ensure sustainability and to minimize technical difficulty with the templates designed and simplified from the basic features used in a spreadsheet file.

The E-class record consists of all learning areas in the elementary and high school level. A teacher must have an own copy of the template of subject or specific learning area assigned to him, and input all the data needed in spreadsheet, encode raw scores in every classroom assessment. After that, the grades will automatically be computed and reports will automatically be generated such as summary of final grades.

Information and Communications Technology (ICT) works along with grading system which promotes accuracy in the computation of grades and efficiency of generating class record, grading sheets, and other pertinent reports needed by the school for submission and decision-making purposes. In manual systems, updating is slow, time consuming and prone to errors. Furthermore, the manual process makes different organizations to encountered problems such as repetitive nature of work, slow generation of reports and increasing volume of paper documents. According to Barreno, Arevalo, Abundo, and Laput (2014), Metropolitan Academy of Manila School uses a manual way of computing grades and adding information or records of both students and teachers. The process entails a lot of effort and by computing and storing of data manually the process is prone to error especially for the teacher who handled two or more classes. Through the advent of technology, ICT paved the way for many people to facilitate ICT tools in order to automate these different institutional activities.

In Zayed University in the United Arab Em irates, Bataineh, and Abbar (2007) conducted a survey to assess and measure the usefulness, usability and effectiveness of M-grade, a new mobile-based electronic grade system that was designed to replace the traditional paper-based methods of managing grades in the school system within the gulf region. The new system provides many features and functionalities that assists teacher's recording and managing students' performance assessment. By using the Personal Digital Assistant (PDA) device, teachers are capable of entering and processing student grade data into their electronic grade sheet anytime and anywhere. The application creates final grade report where it can be submitted to the school administration wirelessly. The results of the survey have shown that the new tool is very useful, easy to use and learn, and effective.

In Korea, an online grading system was developed wherein the primary aim is to collect, process, and return the grades produced by the teachers. According to Thompson and Ahm (2012), it is shown and emphasized that this system has a number of advantages over manual grading methods, including scalability, real-time feedback on the status of grading, the reduced potential for human error in compiling grades, the ability for teacher to grade remotely and to revise their grades after submission, the ability for course administrators to easily review grading results and remove statistical outliers from the score set, the ability to return both provisional and final grades to the course faculty, staff, and students in a timely manner, and the ability to archive and export grading data for future use.

In Dagupan City National High School in the Pangasinan, Philippines, Cornel (2010) emphasized that an e-Student Personnel Record can quickly and efficiently help teachers and school administrators interact with each other for a positive education experience. The teacher can record and compute grades, and add comments about study habits. School administrator could see at glance the daily classroom routine and the progression of grades. Students could keep abreast of how well they were on task and their current scores.

K-12 Online Grading System in Agoo West District, Deped Division of La Union, Philippines was developed, validated and tested. Duran (2013) emphasized that the software was highly valid in terms of functionality and automation. Furthermore, the software was

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highly usable as to content, organization, readability, navigation, user interface design, performance and effectiveness. Moreover, the usability of the software was significant. Hence, the developed software is valid and usable.

Studies or the developed system mentioned above proved that by using technology or application system in grading process is much more effective and efficient medium. However, multiplatform application can be one of the best system development that can be enhanced according to those related studies. In this new generation, multiplatform application installed in both computer and mobile platform is increasingly used by the technology users.

However, applications or programs in mobile platform are an upgrade or maybe an elevation of the programs that is installed in the computer platform. It is exactly as the name implies – technology that is portable. Access is the primary benefit of mobile technology. There are thousands of applications or programs that can help people to stay informed anywhere or anytime. It has a higher efficiency in terms of being more efficient and provides most efficient solution to any businesses and work today with endless possibilities, knowing the appropriateness to use mobile devices as an important aspect in this increasingly connected world. Teacher-empowering technologies include mobile apps which contribute help in teaching and enhancing strategies such as comprising these in a grading system.

The researchers grabbed the opportunity to use this technology for developing a study entitled "K-12 Multiplatform Gradebook Application" wherein it can be both accessed and viewed in both computer and mobile platform. In this way, the developed study will be used more purposively, powerful and meaningful. It is well-suited for managing grades of students compared to the existing e-class record which can lead to duplicate work, limited to single person or PC and without purchasing additional equipment and software, there is no way to back-up the data, leaving it exposed to data corruption or even total loss. With the developed system, convenience in recording, retrieving, and updating student's academic records in an effective and efficient manner can be achieved. Moreover security, accessibility and scalability of the data in a class record are rest assured. Using of this software, teachers could be needlessly wasting hours assessing students with an antiquated system.

II. STATEMENT OF OBJECTIVES

The primary purpose of this study is to design and develop K-12 Multi-platform Gradebook Application.

Specifically, it was aimed to achieve the following objectives:

1. To determine a framework to develop the k-12 multiplatform gradebook application; and
2. To determine the level of usability and the acceptability of the K-12 multiplatform gradebook application.

III. METHODOLOGY

In this study, descriptive and developmental research design were used. The conduct of an interview was applied in to gather the procedures and guidelines of K-12 grading system, the presently used e-class record and to assure the reliability of information. Procedures or guidelines of K-12 grading system are very essential in developing K-12 Multiplatform Gradebook Application. It is the basis on how the system will work in terms of recording the scores of exams, quizzes, and activities and computing the grades in accordance with the policy of classroom assessment or with the DepEd Order No.8 s.2015.

In determining the framework of the k-12 multiplatform gradebook application, Iterative and Incremental development model was used which includes four phases: Inception, Elaboration, Construction, and Transition. The developed system was measured using Software Usability Measurement Inventory (SUMI) by Veenendaal (1998).and evaluated by 5 IT experts as shown in table 1.

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TABLE 1. Distribution of the Respondents for level of Usability of K-12 Multiplatform Gradebook Application

Evaluator	Qualifications	Institution
1. Evaluator 1	Application Developer	PSU-Lingayen
2. Evaluator 2	Web Developer	PSU-Lingayen
3. Evaluator 3	Application Developer	Colegio De Dagupan
4. Evaluator 4	Web Developer	Colegio De Dagupan
5. Evaluator 5	Web Developer	PSU-Urdaneta

It was also measured using ISO 9126-1 by McCall (1977) and Boehm (1978) and evaluated by 139 secondary teachers from Mangaldan National High School, Pangasinan and 2 DepEd supervisors from DepEd Division Office Pangsinan I and Regional Office I, City of San Fernando, La Union. Each of the items of the questionnaire that indicates to determine the level of usability and level of acceptability of the developed K-12 multiplatform gradebook application was analyzed and categorized using 5-point Likert Scale and was tabulated using frequency count and mean.

IV. FINDINGS

Framework of K-12 Multiplatform Gradebook Application

Iterative and incremental development model was used to determine the overall framework of the developed system. Harisha (2017) stated that a methodical approach to software development results in fewer defects and, therefore, ultimately provides shorter delivery time and better value. Through this, the following results were found and documented.

Overview of the System

The developed system improved working method of grading process by enhancing the e-class record which is an MS Excel based. It is designed exactly to what the teachers need or suitable in assessing the students in classroom.

The developed system is interactive and user-friendly interface such that even those with little or no knowledge working with the computers can easily operate it. This can be implemented to be used by the whole campus or institution as one tool in classroom assessment. A multiplatform based, wherein the system can run to the computer platform and mobile platform. The administrator and the teachers are the two user requirements of the system. They can both access the computer based system through username and password security where the grading process will take place. But only the teachers can access the mobile based application for viewing of grades or academic records. All entered data in the system will be saved in one database, in other words, all the students' records in the entire school are in one place to avoid data redundancy and loss. The system provides also the capability to back-up the recorded data in present school year and previous school year.

Inception

In this phase, based from the result of the interview (see Appendix F) that is used in the development of the study, the researcher considered or identified the procedure or guidelines of k-12 grading system based from the DepEd Order No.8 s.2015 (pls refer to page 17). It shows the steps on how the grades are computed or how the teachers do the grading process.

Another factor considered in the developed system is the e-class record. This is an automated grading system using MS Excel implemented by the DepEd last school year 2015-2016. This is used to identify what information or data should be included in the system such as student's information, school details and reports generated.

K-12 grading system and e-class record are carefully studied as the basis in the functionalities and structure applied to the developed system.

Elaboration

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After the requirements has been identified and studied during inception phase, overall architecture and visual models were presented in this phase. It helped the researcher in visualizing the design and features of the system.

Figure 1 shows the system architecture of the developed K-12 Multiplatform Gradebook Application in local networking to the specified school or campus. Technically, the system is composed of three components. The first component functions as the server computer. It enables the administrator to save all the data that comes back and forth to a single database which can be accessed by the teacher. The administrator also control the back-up process, including how often back-ups are performed, whether to back-up the data in whole school year or just the data that has changed during the school year. The administrator acts as a controller of the system. The second component represents the access control of the teacher through desktop computer with a wifi receiver for server connection or with a laptop device, wherein the teacher can add academic records of their students and generate reports such as grade sheets, final grades, and summary of grades. The third component signifies the access of the teacher from the server through mobile devices in viewing academic records of their students. The mobile phone should be connected with the IP address of the server computer.

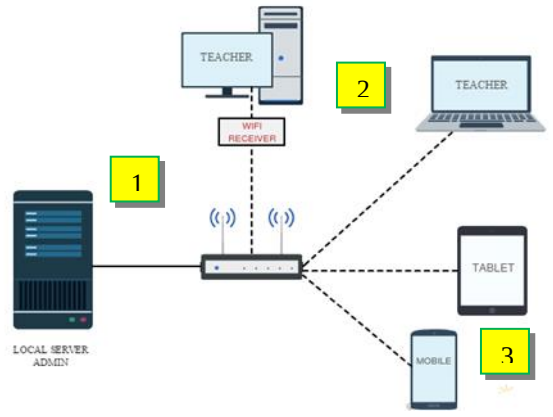

Fig 1. System Architecture Diagram of K-12 Multiplatform Gradebook Application

Figure 2 shows the Use Case Diagram portraying the whole feature of the developed system.

The administrator and the teacher are the user requirements of the system. The primarily role of administrator is to control or to handle the server of the system such as teacher's account, school details, subjects and section, student's information, database content, grade sheets, viewing the progress report of the students through a graphical representation, data reset and data back-up. Administrator will be the principal of the school or any authorized user. Local database synchronization is facilitated only by the administrator or principal.

Teacher has limited access to the system. Adding raw scores to academic records to an assigned subjects and students to him is the main function of the teacher. The teacher has also the capability to update his account after logging-in to the system. Also, he can generate reports such as academic records per quarter, summary of final grades of the whole school year with the capability of viewing the progress reports through graphical representation (see Plate 10).

With the synchronization of the database remotely to the mobile devices, teacher can then view the academic records from it. To be clearly stated, the data that comes back and forth to the server computer should be connected through local networking with the mobile phone with the use of application. Additionally, he can filter the academic records by highest-lowest or lowest-highest of the scores per area and final grade, in order to monitor the ranking of the students.

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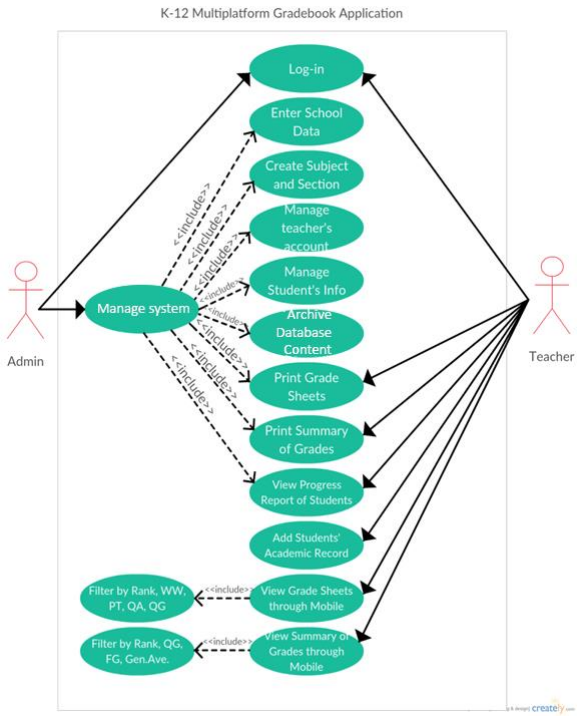

Fig 2 . Use Case Diagram of K-12 Multiplatform Gradebook Application

Legend: WW- Written Work, PT-Performance Task, QA-Quarterly Assessment, QG-Quarterly Grade, FG – Final Grade

Construction

This presents the system design and fully developed K-12 Multiplatform Gradebook Application, which includes the build iteration and functionalities of the system.

The Administrator can access various pages of the system which is depicted in Plate 1 to Plate 14. The Plate 1 shown below enables the administrator to log-in to the system with username and password security for him to manage the system such as adding student's information in the list, registration of teachers, viewing and printing academic records and summary of grades, adding sections and subjects in the present school year, archiving database contents and resetting or clearing the grades for another school year, and updating school details.

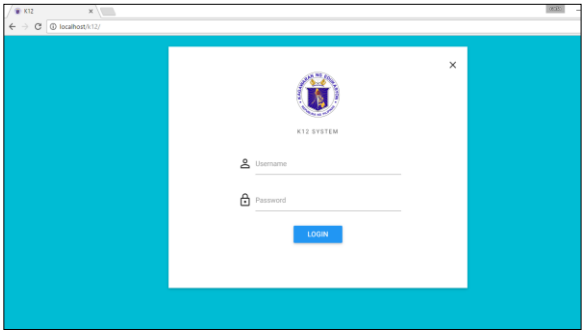

Plate 1. Log-in Page

Plate 2 to Plate 4 shows the page where the administrator can add and view the list of students that are enrolled in the school. Administrator can add the students individually in the database of the system which is presented in Plate 2, or importing the list of students from MS Excel with csv file format as displayed in Plate 3. List of added students in the database of the students can be viewed or searched in the Students List as presented in Plate 4.

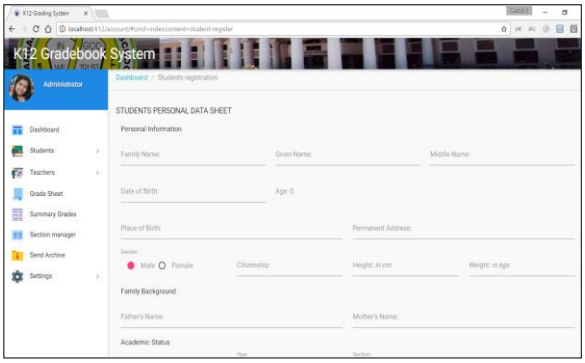

Plate 2. Adding Student's Information to the System

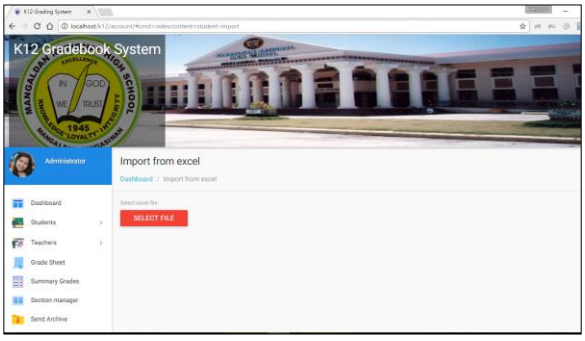

Plate 3. Importing Students' Data from MS Excel

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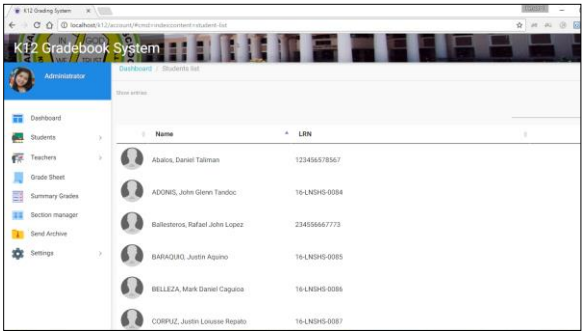

Plate 4. Students List

Plate 5 and 6 illustrates the registration of teachers in the system. Administrator is responsible in adding teacher's account for them to access the system as shown in Plate 5. After registering teacher, assigning to subjects they will teach and sections they will handle was followed as presented in Plate 6.

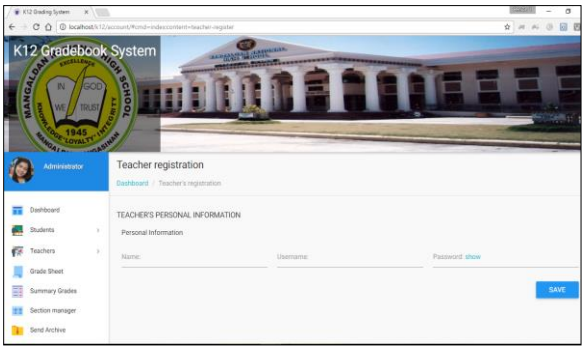

Plate 5. Registration or Adding Teachers Account

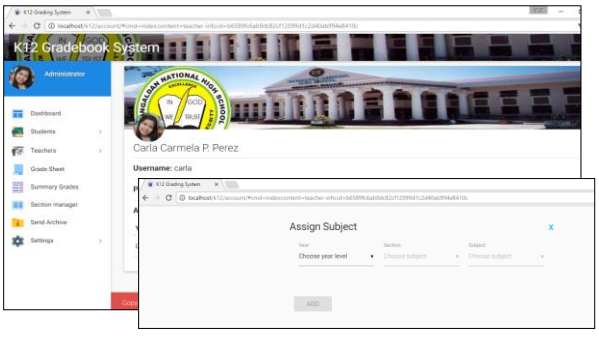

Plate 6. Assigning Section and Subjects to Teacher

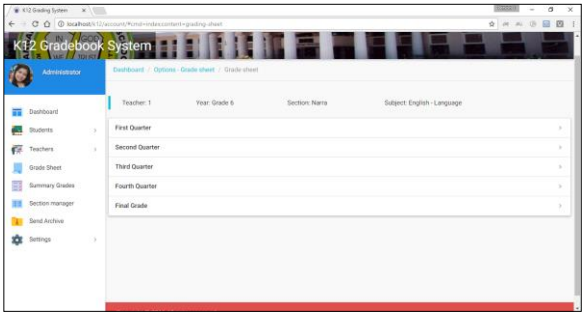

Plate 7. Grade Sheet for the Whole Quarter

Administrator can view the academic records of each section and their subject in the specified year level that was assigned to each teacher which is presented in Plate 7 and 8. Plate 7 shows the grade sheets for the whole quarter and final grades for four quarters with a sample grade sheet or academic record in first quarter depicted in Plate 8.

Summary of grades per section can also be viewed by the administrator as shown in Plate 9 and 10. Plate 9 signified the summary of grades per quarter. Moreover, progress report of the students per quarter can be viewed by graphical presentation as shown in Plate 10.

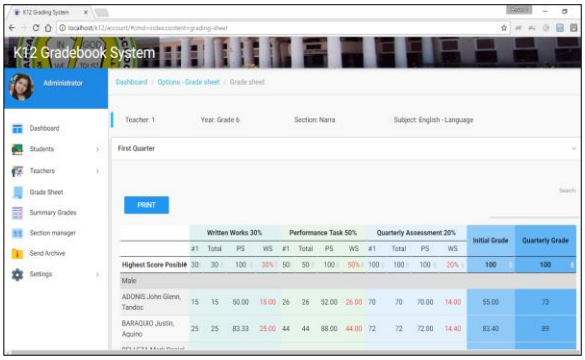

Plate 8. Sample Grade Sheet

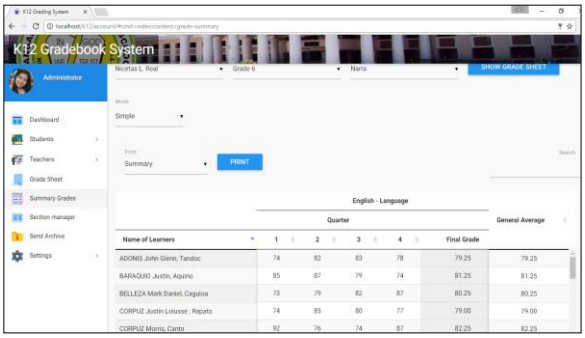

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Plate 9. Summary of Grades for the Whole Quarter

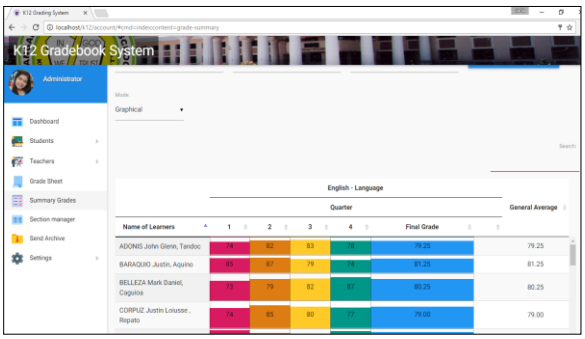

Plate 10. Progress Report of the Students per Quarter

Adding of sections and subject before the start of the school year can be performed by the "section manager". All year level from grade 1 to grade 12 is already comprised in the section manager page as presented in Plate 11. To add sections and subjects, the admin must click the add section or add subject icon at the right side of each grade level as displayed in the same Plate. Plate 12 and 13 showed the way how to add sections and subject. The administrator is responsible also to specify the percentage of written works, performance tasks, and quarterly assessment according to the grading system rule from DepEd or the desired adjustments as presented in Plate 13.

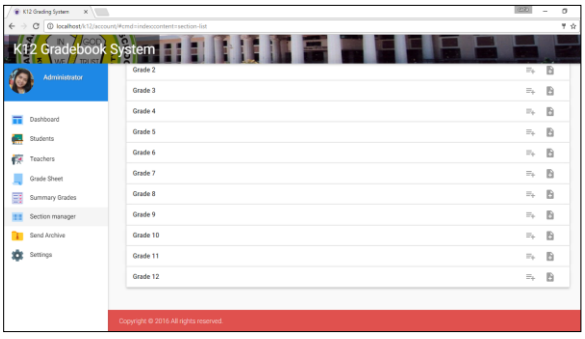

Plate 11. Section Manager

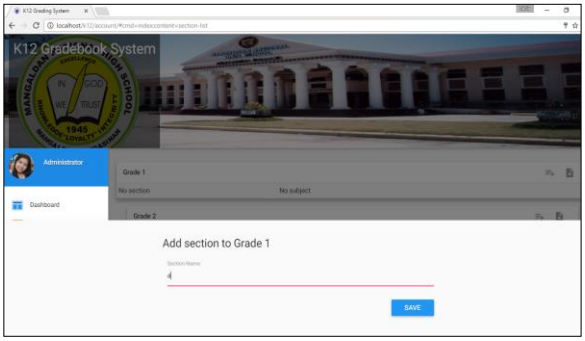

Plate 12. Adding Section

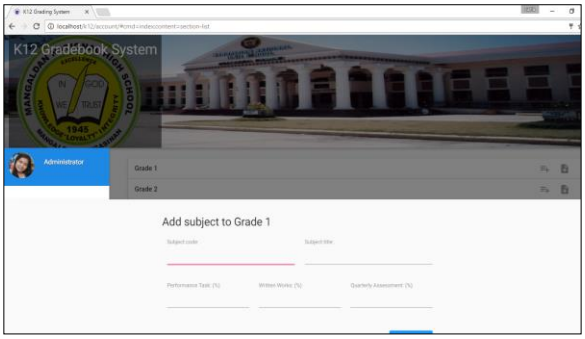

Plate 13. Adding Subject

Plate 14 shows the archiving database contents, resetting the grades for another school year, and viewing the records from previous school year. It displays the latest date of database backup to remind the user when is the last back-up date.

Plate 15 to 19 represented the account accessed by the teacher. After logging-in the system the teacher allows to view grade sheet, summary of grades and account info. Plate 15 and 16 depicted the grade sheet for the whole quarter. The teacher can add scores of students to every component such as written work, performance task, and quarterly assessment in grade sheet by clicking the add grade in each quarter as presented in Plate 17.

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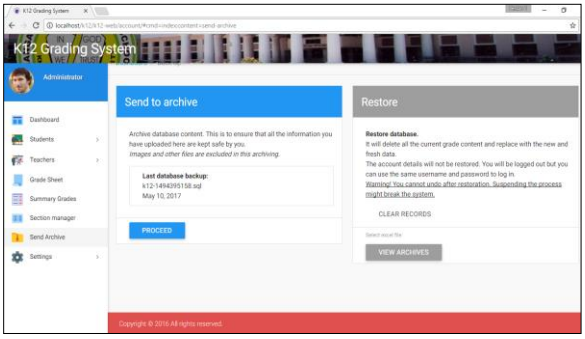

Plate 14. Archiving and Restoration Content

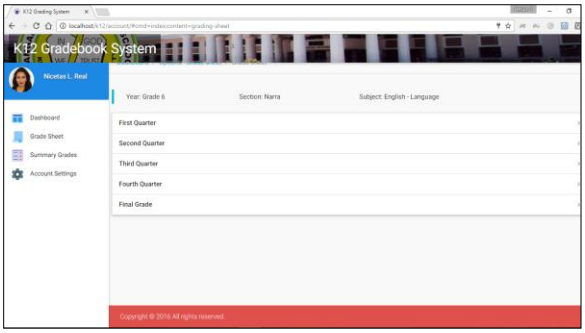

Plate 15. Grade Sheets for the Whole Quarter

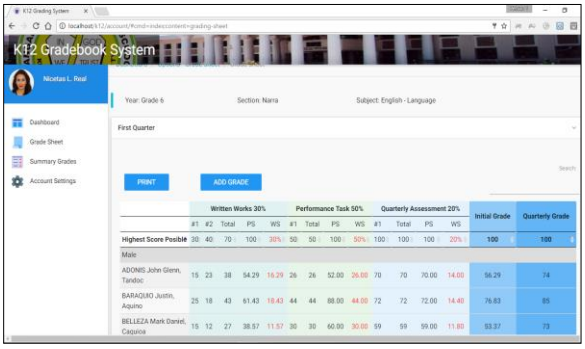

Plate 16. Sample Grade Sheet for a Quarter

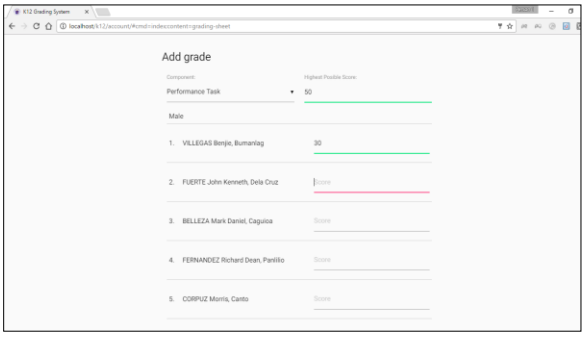

Plate 17. Adding Scores/Grades to a Specified Component

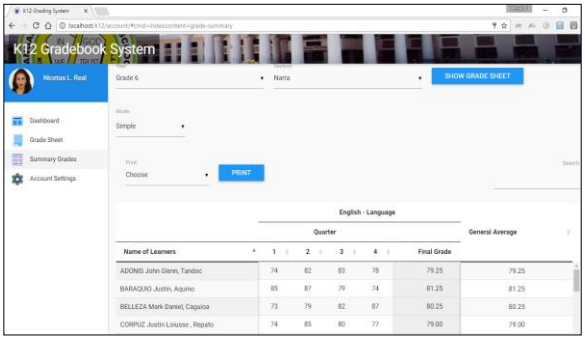

Plate 18. Summary of Grades

Plate 18 shows the summary of grades for four quarters with the general average. Teachers can also view the progress report of his students comparing the grades per quarter presented in visual graphics as seen in Plate 19.

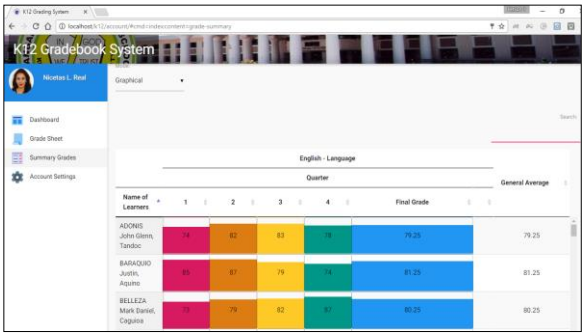

Plate 19. Progress Report in Every Quarter

The Plate 20 to 22 presented the sample print-outs of grade sheet or academic records, summary of grades and sample report card of every student.

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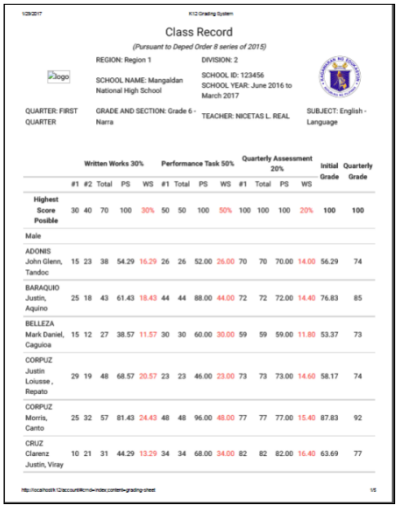


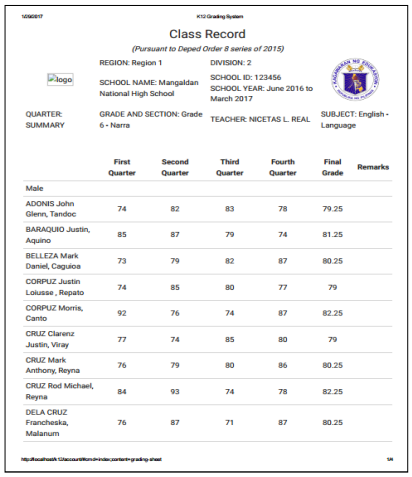
Class Record

(Pursuant to Deped Order 8 series of 2015)

REGION: Region 1 | DIVISION: 2
SCHOOL NAME: Mangaldan National High School | SCHOOL ID: 123456 | SCHOOL YEAR: June 2016 to March 2017
QUARTER: FIRST QUARTER | GRADE AND SECTION: Grade 6 - Narra | TEACHER: NICETAS L. REAL | SUBJECT: English - Language

	Written Works 30%					Performance Task 50%					Quarterly Assessment 20%				Initial Grade	Quarterly Grade
	#1	#2	Total	PS	WS	#1	Total	PS	WS	#1	Total	PS	WS		
Highest Score Possible	30	40	70	100	30%	50	50	100	50%	100	100	100	20%	100	100
Male															
ADONIS John Glenn, Tandoc	15	23	38	54.29	16.29	26	26	52.00	26.00	70	70	70.00	14.00	56.29	74
BARAQUIO Justin, Aquino	25	18	43	61.43	18.43	44	44	88.00	44.00	72	72	72.00	14.40	76.83	85
BELLEZA Mark Daniel, Caguioa	15	12	27	38.57	11.57	30	30	60.00	30.00	59	59	59.00	11.80	53.37	73
CORPUZ Justin Loiusse , Repato	29	19	48	68.57	20.57	23	23	46.00	23.00	73	73	73.00	14.60	58.17	74
CORPUZ Morris, Canto	25	32	57	81.43	24.43	48	48	96.00	48.00	77	77	77.00	15.40	87.83	92
CRUZ Clarenz Justin, Viray	10	21	31	44.29	13.29	34	34	68.00	34.00	82	82	82.00	16.40	63.69	77

Plate 20. Sample Print-Outs of Academic Records



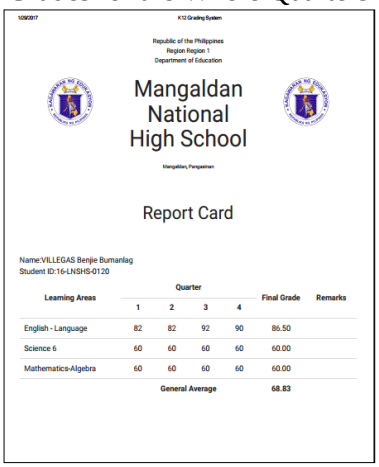
Class Record

(Pursuant to Deped Order 8 series of 2015)

REGION: Region 1 | DIVISION: 2
SCHOOL NAME: Mangaldan National High School | SCHOOL ID: 123456 | SCHOOL YEAR: June 2016 to March 2017
QUARTER: SUMMARY | GRADE AND SECTION: Grade 6 - Narra | TEACHER: NICETAS L. REAL | SUBJECT: English - Language

	First Quarter	Second Quarter	Third Quarter	Fourth Quarter	Final Grade	Remarks
Male						
ADONIS John Glenn, Tandoc	74	82	83	78	79.25	
BARAQUIO Justin, Aquino	85	87	79	74	81.25	
BELLEZA Mark Daniel, Caguioa	73	79	82	87	80.25	
CORPUZ Justin Loiusse , Repato	74	85	80	77	79	
CORPUZ Morris, Canto	92	76	74	87	82.25	
CRUZ Clarenz Justin, Viray	77	74	85	80	79	
CRUZ Mark Anthony, Reyna	76	79	80	86	80.25	
CRUZ Rod Michael, Reyna	84	93	74	78	82.25	
DELA CRUZ Francheska, Malanum	76	87	71	87	80.25	

Plate 21. Sample Print-outs of Summary of Final Grades for the Whole Quarters



Republic of the Philippines
Region Region 1
Department of Education

Mangaldan National High School

Report Card

Name:VILLEGAS Benjie Bumanlag
Student ID:16-LNSHS-0120

Learning Areas	Quarter 1	2	3	4	Final Grade	Remarks
English - Language	82	82	92	90	86.50	
Science 6	60	60	60	60	60.00	
Mathematics-Algebra	60	60	60	60	60.00	
			General Average		68.83	

Plate 22. Sample Print-outs of Report Card

The mobile application on Plate 23 to 26 provides access of academic records of students to teachers for viewing purposes only.

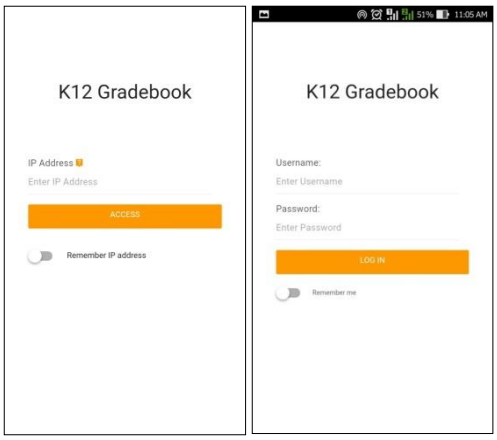


Plate 23. Entering IP Address of the Server and the Username and Password of Teacher

Plate 23 presented the entry of IP address and, username and password. To access the data from the server, the teacher must know its IP address. After successfully connecting to the server by entering the IP address, the teacher should log-in to his account through the application.

Plate 24. Home Page of Mobile App

Plate 24 depicts the Home Page of teacher's account in Mobile App with grading sheet, summary of grades and settings menus or tabs to access. Plate 25 shows the viewing of grading sheet with same process as in computer based system. The teacher can also view the scores and grades of the students from highest to

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lowest or lowest to highest for checking the rank of the students and for monitoring purposes.

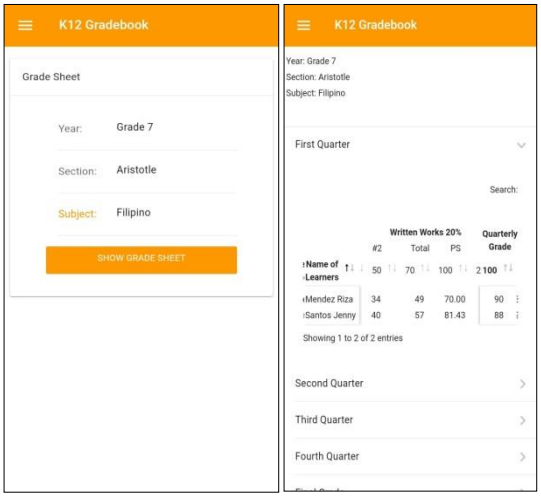

Plate 25. Viewing Grade Sheet through Mobile

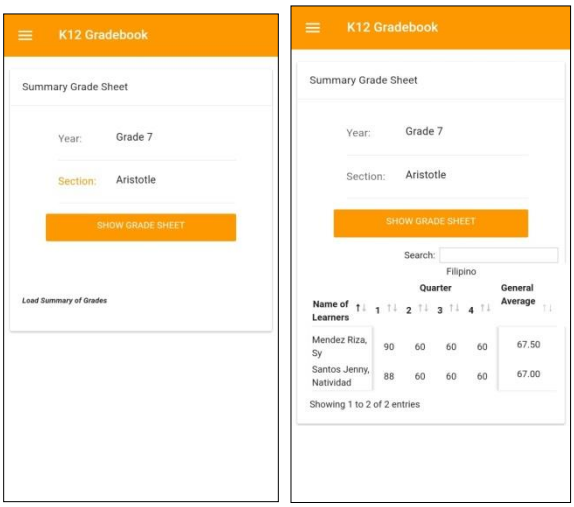

Plate 26. Viewing the Summary of Grades through Mobile

Teachers at the same time can view the summary of grades or the final grades for four quarters by selecting the year and section as displayed in Plate 26 above. This shows the quarterly grades and general average of the students in one section.

Transition

In this phase, the system was employed and tested for its usability and acceptability wherein it was evaluated and tested by 5 IT experts, 139 high school teachers, and 2 Division supervisors. The results were indicated in the level of usability and acceptability of the developed system on page 46. As stated by Burton (2009) system assessment of user satisfaction or appreciation thus serve as a diagnostic method of its implementation.

The following table represents the hardware and software minimum requirements that are needed for the implementation of the system to meet the best performance and to work it properly.

Table 2. Hardware and Software Requirements of the System

Hardware/Software Requirements	Specification
1. Desktop/ Laptop Computer	
• Processor	Intel i3 processor or higher
• Memory	2GB RAM
• HDD	320 GB
• Available Disk Space	1 GB
• Operating System (OS)	Windows 7 or higher
• Server Support	Apache Server 2.4.23, PHP 5.7.14, MySQL Client Version 5.6.25
• Web Browser	Google Chrome
2. Mobile Devices	
• Processor	Quad Core 1.2 GHz
• Memory/RAM	1 GB
• Operating System(OS)	Android 5.0

Usability of K-12 Multiplatform Gradebook Application

Usability measurement and testing of the developed system was conducted to ensure that the system is usable and working properly, efficiently and appropriately to the given requirements and helpful to the users. It was evaluated through a questionnaire based from

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SUMI focusing on efficiency, affect, helpfulness, control, and learnability. The questionnaire was distributed to 5 IT experts from different Institutions.

The Table 3 presents the mean of each indicator for usability of the developed system in terms of efficiency, affect, helpfulness, control and learnability. The learnability indicator garnered the highest mean at 4.95, while the lowest mean at 4.78 was computed for the helpfulness indicator. With a mean of 4.88, it can be concluded that the developed system is very usable in terms of efficiency, affect, helpfulness, control and learnability. It only shows that it is performing and functioning well with a least waste of time and effort, satisfies the user, provides higher throughput, and easy to use and to learn. Albers and Still (2011) states that usability tests should indicate that everything about a system is working fine and end users are able to use the system to complete tasks successfully.

TABLE 3. Summary of the Usability of K-12 Gradebook Multiplatform Gradebook Application

Indicator	Mean	Descriptive Equivalent	Descriptive Interpretation
1. Efficiency	4.93	Fully Agree	Very Usable
2. Affect	4.83	Fully Agree	Very Usable
3. Helpfulness	4.78	Fully Agree	Very Usable
4. Control	4.93	Fully Agree	Very Usable
5. Learnability	4.95	Fully Agree	Very Usable
Mean	4.88	Fully Agree	Very Usable

Acceptability of K-12 Multiplatform Gradebook Application

In this phase, the developed system was measured and tested its acceptability. Acceptability measurement was conducted to ensure that the system performs accurately and appropriately to the given requirements and satisfies the users' need.

It was evaluated through a questionnaire based from ISO 9126-1 focusing on functionality, reliability, usability, efficiency, maintainability, and portability. The questionnaire was distributed to 139 faculty members of Mangaldan National High School, Mangaldan, Pangasinan that was selected as the respondents and obliged to be the user of the system. Additionally, 2 supervisors were also selected as one of the respondents of the system, 1 supervisor from DepEd Regional Office I and 1 supervisor from DepEd Division Pangasinan I.

The Table 4 presents the mean of each indicator for acceptability of the developed system in terms of functionality, reliability, usability, efficiency, maintainability, and portability. The functionality indicator garnered the highest mean at 4.55, while the lowest mean at 4.40 was computed for the reliability indicator. With a grand mean of 4.50, it can be concluded that the developed system is acceptable in terms of functionality, reliability, usability, efficiency, maintainability, and portability.

TABLE 4. Summary of the Acceptability of K-12 Multiplatform Gradebook Application

Indicator	Mean	Descriptive Equivalent	Descriptive Interpretation
1. Functionality	4.55	Excellent	Acceptable
2. Reliability	4.40	Excellent	Acceptable
3. Usability	4.55	Excellent	Acceptable
4. Efficiency	4.52	Excellent	Acceptable
5. Maintainability	4.43	Excellent	Acceptable
6. Portability	4.54	Excellent	Acceptable

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Mean	4.50	Excellent	Acceptable

V. CONCLUSIONS

Based on the findings, the researchers arrived at the following conclusions:

1. Using iterative and incremental development model was resulting to well developed and well function system.
2. The developed system is very usable in terms of functionality, affect, helpfulness, control, and learnability and acceptable in terms functionality, reliability, usability, efficiency, maintainability, and portability which shows that the system functions well with commands easy to learn and can be implemented for grading process.

VI. RECOMMENDATIONS

Based on the conclusions, the following are hereby recommended:

1. The K-12 grading system is recommended to be reviewed by the end-users before using the developed system.
3. Usability and acceptability evaluation of a system is recommended to apply by the future researchers for good implementation of their developed system.
4. The K-12 Multiplatform Gradebook Application is recommended to be fully implemented in all DepEd Schools in the Region 1.

VII. ACKNOWLEDGMENT

Grateful acknowledgement is expressed to our God, the Almighty One, who served as a guide and gave knowledge, strength, and all the blessings to the researchers including those who helped them in the completion of this research study. And to all those who have become a big part of the researchers' life, who served as an inspiration and motivation in doing this study.

The researchers would also like to express their warmest gratitude to Don Mariano Marcos Memorial State Univeristy, Mid La Union Campus, College of Information Technology for the encouragements and concern in doing this study.

VIII. REFERENCES

Albers, M. & Still B. (2011). Usability of Complex Information Systems- Evaluation of User Interaction. London, New York: CRC Press

Barreno, et.al (2014). Computerized Grading System for Metropolitan Academy of Manila. Metropolitan Academy of Manila, Manila, Philippines

Bataineh, E. & Al Abbar, H. (2007). New Mobile-based Electronic Grade Management System. Vancouver, Canada: Association for the Advancement of Computing in Education (AACE)

Burton, S. (2009). Information System Implementation. Pennsylvania: Irwin

Cornel, L.D. (2011).DCNHS e-student Personal Record.Collegio de Dagupan, Dagupan City, Pangasinan.

DepEd Order No.8 s.2015. Policy Guidelines on Classroom Assessment for the K to 12 Basic Education Program. DepEd Complex Meralco Avenue, Pasig City

Duran, I.L. (2013). K-12 Online Grading System. Iamure International Journal of the Multidisciplinary Research, Vol. 7 No. 1(2013)

Harisha, K. R. (2017). Software Development Process and Its Importance Retrieved April 2017. From www. Streetdirectory.com/travelguide/135488/software/software_development_process_and_its_importance.html

Hudsonville Public Schools. (2015). Grading Scale Changes. Retrieved April 2017 from http://www.hudsonville.k12.mi.us/news/Grading-Scale-Changes.cfm?grp_id=20603

McCall (1977) and Boehm (1978). Software Quality Attributes. Retrieved February 2016 from http://www.sqa.net/softwarequalityattributes.html

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www.sajst.org

Thompson, M. , Ahm, B. (2012). The Development of an Online Grading System for Distributed Grading. Korea: ResearchGate