PEEVSY: A Web-Based Performance Evaluation System For Cagayan State University

Edison Datul Bravo

ABSTRACT : The rapid developments in education is basically the result of a whirlwind change in the techniques of teaching. Globalization, ASEAN integration and the 21st century education are among the factors in which higher education institutions are really triggered to shift from the traditional approach of learning to a more technology and student learning approach that could meet the demands in the sudden change of education. Therefore, teachers and other stakeholders should advance and enrich their teaching styles and approaches in order to equip the learners with the latest concepts and theories which they can apply in their jobs. This study aimed to develop a web-based performance evaluation system for Cagayan State University that consolidates and generates report on the performance of the learners as assessed by the teachers in terms of the skills and competencies they have developed from the learning outcomes of the course after they are exposed with the outcomes-based education model. Therefore, the result of the study will be of great help in integrating the 21st century skills in the curriculum that are aligned to the needs of industries and the global workplace. Moreover, the result would be very crucial especially in providing intervention programs that will enhance and develop the capabilities of the students. Through the focus group discussion and the interview methods, the researcher documented different problems and practices encountered by the faculty members in the implementation of the outcomes-based education that are necessary in the development of the online system. Similarly, the iterative model was used in the conceptualization, development and finalization of the proposed web-based performance evaluation system which is a very efficient system model especially in determining the problems and other intervening factors in the completion of the system. As its first use, the software was applied to evaluate BSIT students in order to test its accuracy and reliability. Research findings indisputably showed that the use of the web-based performance evaluation system is efficient and effective in monitoring the progress on the performance of the learners in the different program outcomes set for each of the courses. Likewise, the web-based system is a powerful tool that recommends an intervention program when a learner did not meet the required passing rate for a specific program outcome. Further, the research reflects that the developed system is compliant to ISO 25010 software quality standards which means that it is possible to implement in the entire University system.

Keywords: outcomes-based education, program outcomes, performance evaluation, portal, rubrics, use-case diagram, web-based

———————————————— ◆ ————————————————

1. INTRODUCTION

The birth of Outcomes-based Education (OBE) has paved the way for Higher Education Institutions (HEIs) to continue shifting from the traditional method of teaching to a more student-centered teaching and learning process. In fact, the adoption of this method is being experienced by teachers and students in most educational programs and offerings not only in the private schools but also in government educational institutions whose ultimate mission is to develop the skills and competencies of learners in order to become competitive in their chosen fields of interest. Thus, the learning experience in higher education has shifted paradigms from a teacher-focused approach to a learner-centered strategy (Hsu & Wolfe, 2003). OBE is a method of delivering the contents of a curriculum that focuses on what students can actually do after they have acquired and learned the necessary skills. It shall start with a framework and a set of expectations about the desired learning results which focuses on individual development of the learner (Dejager & Nieuwenhuis, 2005). The modification of the curriculum has been applied widely not only in primary and secondary schools but also in higher education institutions since 1980s. The implementation of OBE impacted the   shift from the traditional teacher-centered (content) system to a student-centered system. The Commission on Higher Education (CHED), in support to OBE and in its quest for quality and excellence, has issued "Memorandum Order No. 46 Series of 2012" entitled, "Policy Standard to Enhance Quality Assurance (QA) in Philippine Higher Education through Outcomes-based and Typology-based QA". Therefore, HEIs must have to fulfill and abide by

_____

- *Edison D. Bravo is an Associate Professor of Cagayan State University - Carig Campus, Carig, Tuguegarao City 3500, Philippines, diver.edz@gmail.com*

this mandate and come-up with mechanisms in order to sustain the implementation of outcomes-based education and that all academic programs should follow the outcomes-based approach in the teaching-learning process.

As contained in CMO No. 46 Series of 2012, institutions are compelled to direct their QA efforts towards meeting CHED quality indicators, making sure that all components and other aspects including procedures and processes of OBE will be followed. As defined by CHED, "quality is the alignment and the consistency of the learning environment with the institution's vision, mission and goals demonstrated by exceptional learning and service outcomes and the development of a culture of quality". With the said provision, learners must always be provided with accurate and reliable theories and concepts and with the technical skills that are aligned with national and international standards so that they can be able to surpass technical challenges in the global arena. Consequently, the 2017 Philippine Development Plan dreams to build a future where every Filipino enjoys a "matatag, maginhawa, at panatag na buhay" that is the Philippines will have a high level of human development by 2022 and all sectors of the society must become globally competitive including Higher Education Institutions. As such, it has included in one of its strategies the improvement on the quality of higher and technical education and research for equity and global competitiveness specifically the integration of 21st century competencies and promoting excellence among higher education institutions. This plan may be of great help to HEIs as they are able to get support from the government towards internationalization and globalization. Similarly, one of CHED mandates is to promote relevant and quality higher education – that is - higher education institutions and programs are at par with international standards and graduates and professionals are highly competent and recognized in the international arena. Using the CHED Implementation Handbook for OBE and Institutional

Sustainability Assessment (ISA) as a reference, HEIs shall develop program outcomes including performance indicators for each outcome and a measurement system for the level of attainment for each indicator. The Intended Learning Outcomes (ILOs) shall be developed which has three components: Institutional level, Program level and Course level. The Cagayan State University(CSU), as an institution of higher learning, hopes to be one of the schools in delivering quality education to its students through massive technology-based learning and outcomes-based education. In its 2017 Strategic Plan, one of the emphases is the internationalization of the curriculum. But this can only be realized if there is a full shift from the traditional way of teaching through outcomes-based strategy and a strict monitoring for its implementation is very much needed in order to achieve the desired results of producing quality and competent learners and graduates. With the present set-up, there is a need to raise the standards especially now that there is a strong competition in the national and global workplace. Though CSU has already started implementing the OBE approach in some of its academic programs since 2014, it is imperative that there must be a tool to consolidate all the outputs and outcomes to make sure that all efforts done in the teaching and learning process is geared towards outcomes-based education and that, it is relevant, accurate and useful. Similarly, in the process of implementing OBE, teachers usually conduct classes following the learning outcomes developed for each of the lessons they have prepared for the course. Unfortunately, there is no method to determine if these learning outcomes are aligned, consistent and able to meet the program outcomes and institutional outcomes of the University. Hence, this study would be an effective tool to monitor the implementation of OBE and to help Cagayan State University attain its vision of transforming lives by educating for the best and in achieving its core values of competence, social responsibility and unifying presence.

2 METHODS

This study was conceptualized in order to develop a web-based performance evaluation system for Cagayan State University. The descriptive and the system development methods of research were used in the conduct of the study. Likewise, the systems development life cycle – specifically the iterative model was utilized. The main instrument in the conduct of the study was the focus group discussion (fgd). It was used to know and understand OBE principles, strategies and the different learning outcomes which were very essential in the design and development of the system. In addition, an interview method was utilized to gather additional information on the different problems, issues, and practices of Cagayan State University towards the implementation of outcomes-based education. To determine compliance of the developed system to Software Quality Standards known as ISO 25010:2011, descriptive statistics such as frequency count and mean were employed.

Figure 1. *Use-case Diagram of the Web-based System*

Figure 1 shows how the users interact with the system. The administrator manages the student information and consolidates evaluation results. The Deans/department chairs shall manage the learning and program outcomes while the teacher entity shall do the evaluation process using a holistic rubric for the performance of students. Processed information in the form of evaluation reports and graphs shall be given and received by the learner, the teacher, the deans/department chairs and the administrator.

3 RESULTS AND DISCUSSION

3.1 The Web-based Performance System

The developed system for outcomes-based student evaluation could be a valuable tool in the implementation of outcomes-based education at CSU. The system allows the deans/administrator to add or upload the learning outcomes of all courses in a curriculum and maps the course learning outcomes to the program outcomes and eventually, can generate an inventory of outcomes. The system has the flexibility to add students, courses, programs and departments and even the campuses of the University. It also allows the users or the faculty members to assess students enrolled in a course using a holistic rubric. The system has a feature of generating reports in the form of a graph or in tabular form.

A.   The Deans Portal

Figure 2. *Masterlist of Programs*

Figure 2 shows the masterlist of programs. The web-based system contains a list of programs offered in the University, each of which is assigned to a department. These programs are bases for classifying students. It includes two important buttons, the new course and import. The new course button allows the administrator to manually add the details of a program while the import button lets a pre-formatted list of programs to be added in the list which traps duplicate program

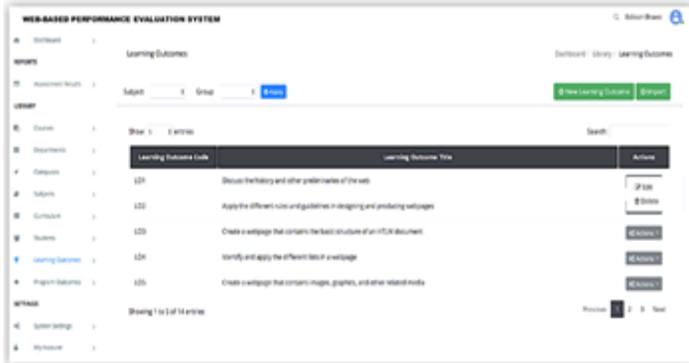names. Similarly, the form allows the administrator to edit or delete a program.

Figure 3. *Masterlist of Departments*

The system includes a masterlist of departments. It allows the administrator to add a new department whenever the University creates an additional department either manually by filling out the necessary field names required by the system or simply uploads a CSV file.
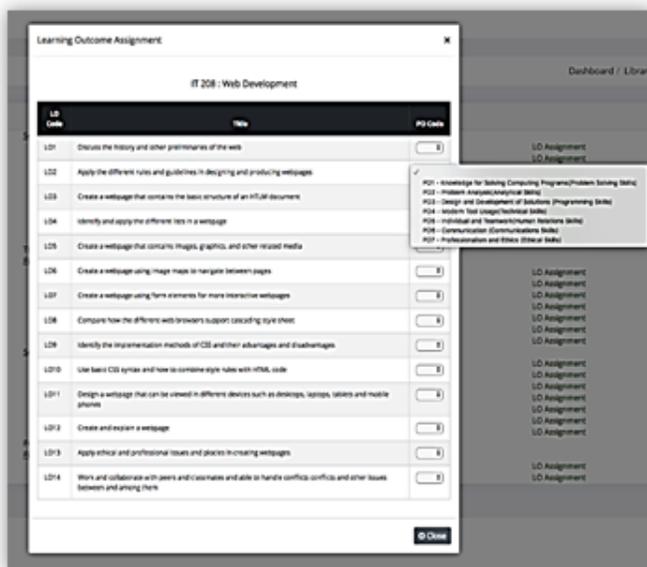

Figure 4. *Masterlist of Courses*

Figure 4 shows the masterlist of courses. These are the actual subjects which are contained in the specific curriculum of every program. The subjects were used because it includes the different learning outcomes that the students shall be able to learn and develop which would be the bases for assessing their performance. In the system, the administrator can add a new course manually or uploads a CSV file for the list of subjects, it can edit an existing course or delete a course as well.
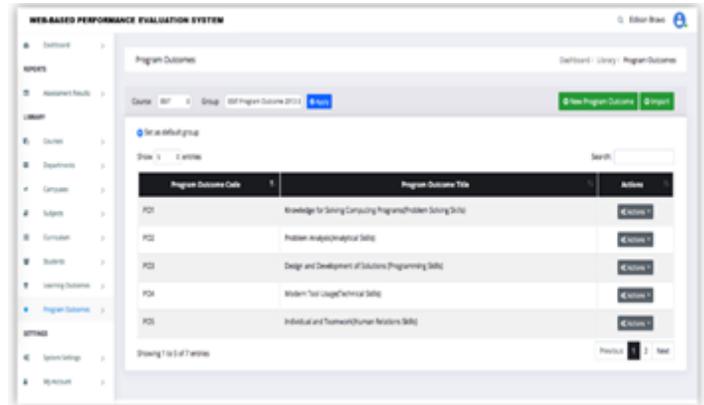
Figure 5. *The Program Outcomes*

This feature of the system is used to manage the program outcomes(POs). A program name can be selected through the combo box and the corresponding group for the set program outcomes. POs can be added once the program name is selected either by entering the details of the program outcome manually or uploading a CSV file containing the list of program outcomes. Similarly, POs can also be edited or can be deleted once there is a change in the list of PLOs set for a certain program.
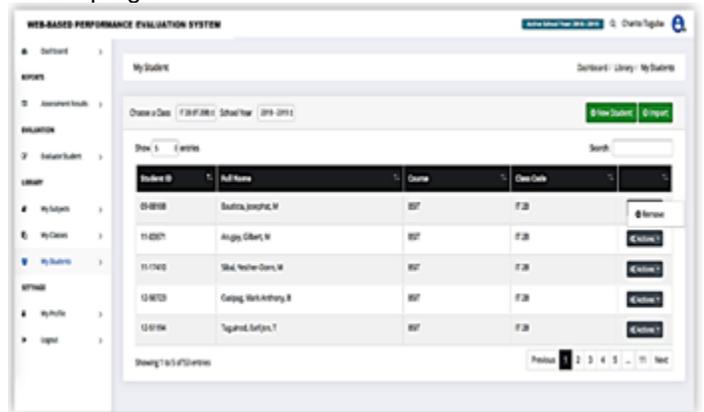

Figure 6. *The Learning Outcomes Window*

This is used to manage the learning outcomes(LOs) of each of the courses included in the program curriculum. To add a new learning outcome, the course(subject) must be selected first. The administrator can manually add a learning outcome or can import a list of learning outcomes. It can also edit or delete a learning outcome.
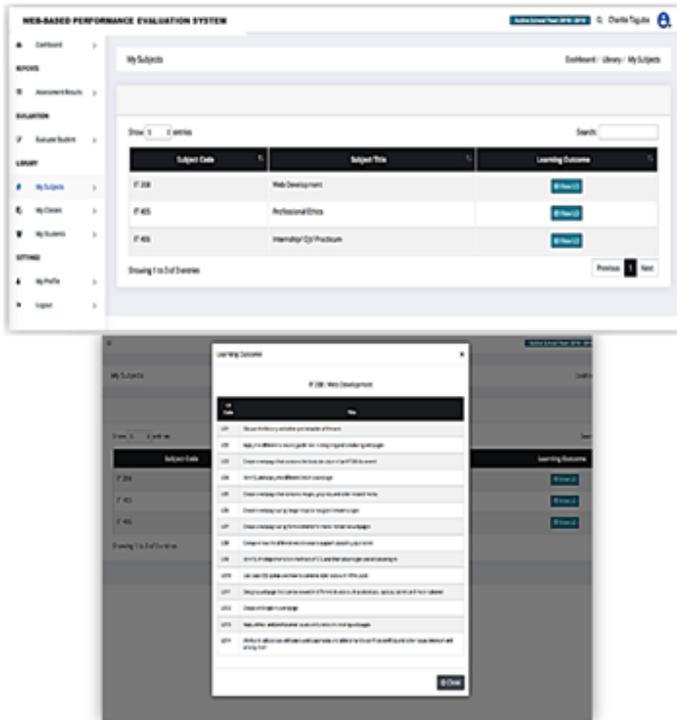
Figure 7. *Learning Outcome Assignment*

This feature of the system is the actual alignment of the learning outcomes of the subjects to the corresponding program outcomes. Since a program has a set of program learning outcomes, and a course has its set of LOs too, the administrator would then be mapping each of the learning outcomes to the corresponding program outcome in order to be consistent with the target goals of the program - making sure that the alignment is accurate towards the attainment of an effective outcomes-based approach.

B. The Teacher Portal
The developed system is not complete without the teacher portal. Hence, the following are the features and modules under the portal.
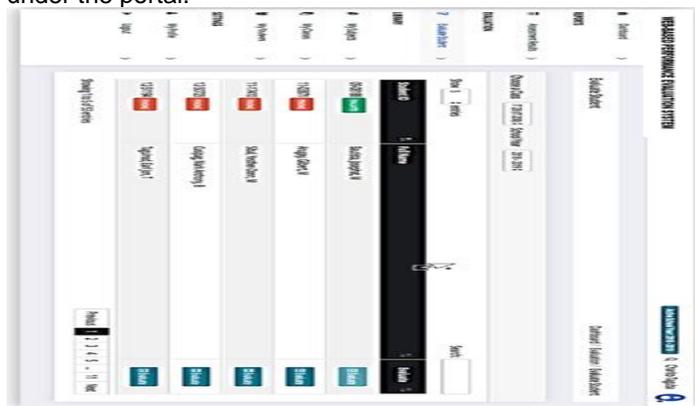
Figure 8. *The My Subjects Window*

Figure 8 shows the form where the teacher can view his/her subjects added by the administrator of the system. It includes a View LO button where a teacher can view the learning outcomes set for a particular subject.
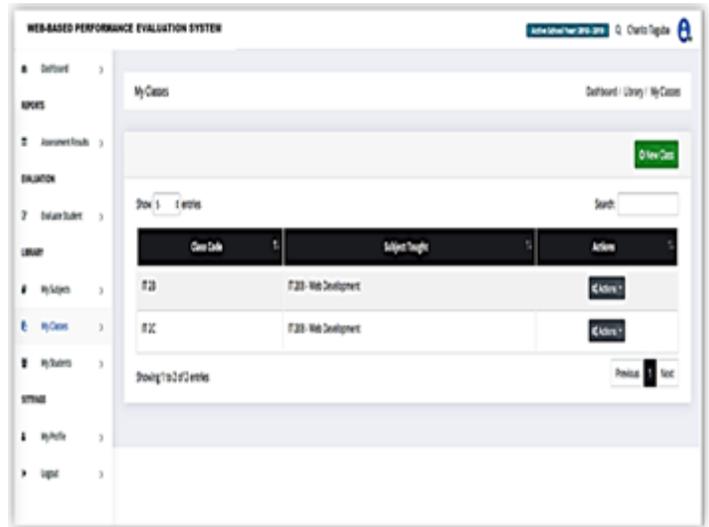

Figure 9. *The My Classes Window*

The system included a feature that allows the teacher to view his/her classes. It contains the list of classes assigned to a teacher for a particular class in a current semester
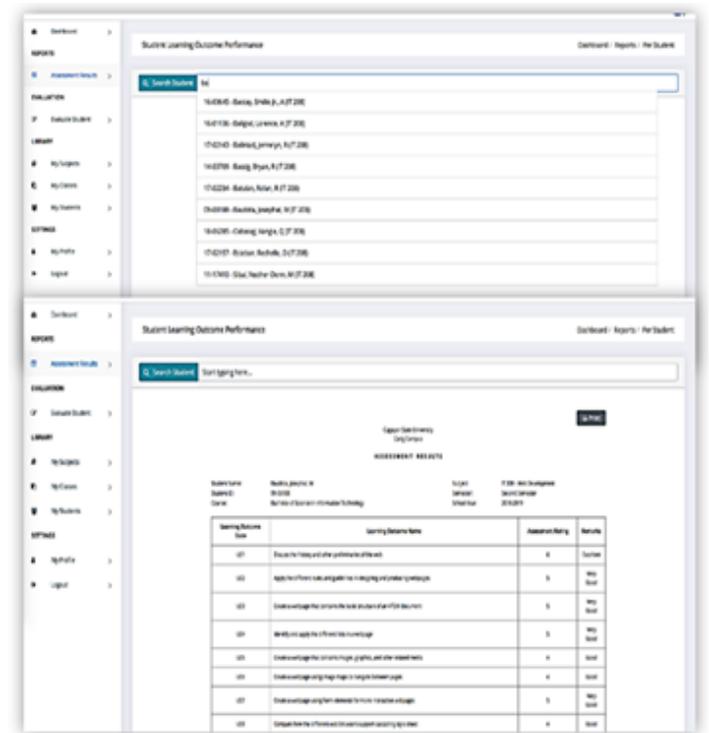

Figure 10. *The My Student Window*

This is where the teacher manages his/her students. The form allows the teacher to filter the list by class and by school year. A new student and import buttons are included in the form so that the teacher can add the student/list of students in case the administrator missed to include in the class list.
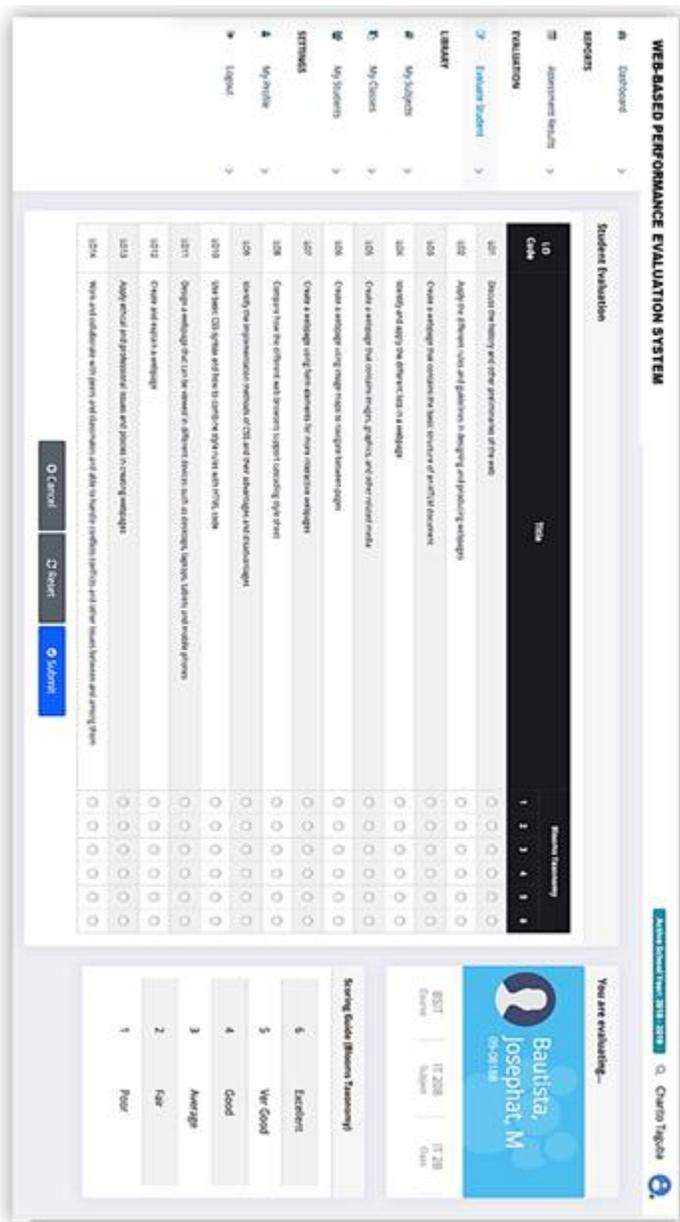
Figure 11. *The Evaluate Student Window*

Figure 11 shows the list of students handled by a teacher. He/she can filter the list of students by class. Here, the teacher can see those students that have been evaluated and with pending evaluation.
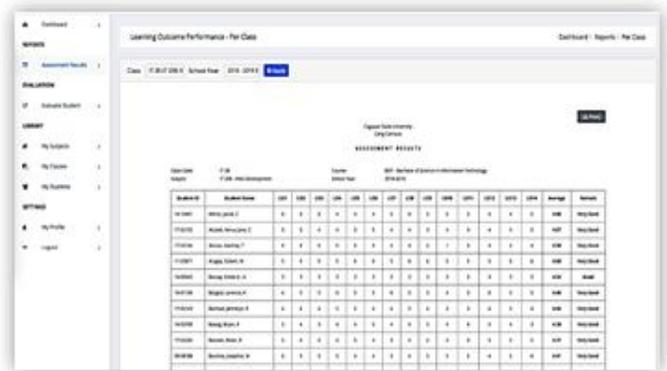

Figure 12. *The Student Evaluation Process Window*

This form is used to evaluate students enrolled in a class. The learning outcomes set for a certain course are listed which shall be the bases of evaluating the performance of students using a holistic rubric using the scale from 1 to 6. Once the teacher is done evaluating the student, he/she has to click the submit button to complete the assessment process.

C. List of Reports

The online performance evaluation system was designed and developed to determine the performance of students, hence, the following are the reports that can be generated from the system.
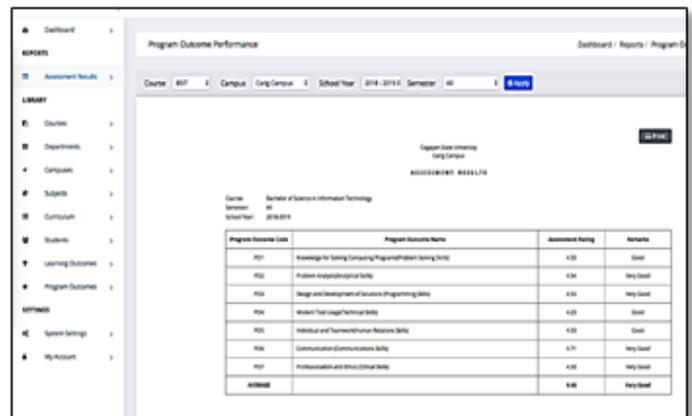

Figure 13. *Individual Learning Outcome Performance*

Figure 13 shows the LO Result window. The administrator can now search student records using either the ID number or the name of the student to display their evaluation results as regards their performance to the different course learning outcomes.

Figure 14. *The LO Report by Class*

Figure 14 shows the show the performance of the students in a class. The system administrator shall be selecting the corresponding class to generate the course learning outcome report of the class.

Figure 15. *PO Performance Report by Students*

The developed system has the capability of generating the performance of students for all the program learning outcomes in all the subjects enrolled in a semester, the system administrator will simply search the name of the student to generate the said report.

Figure 16. *PO Performance Report by Class*

Figure 16 shows the program outcome performance of an entire class. At the bottom part is the average assessment rating of the whole class on the different program outcomes based on the assessed learning outcomes.
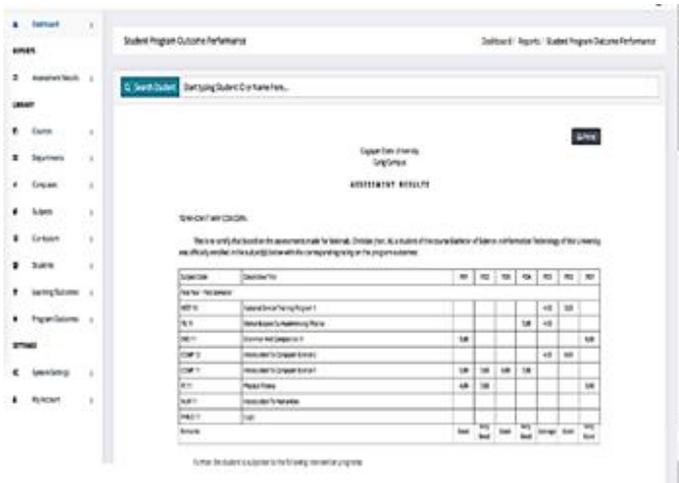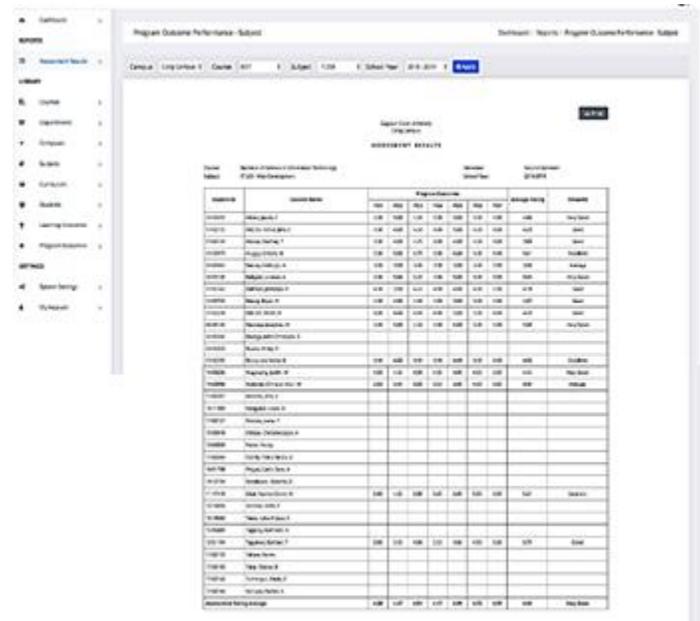

Figure 17. *PO Performance Report of a Program*

Figure 17 shows the program outcome performance report covering all the year levels regardless of the courses taken within a semester. This is a consolidated report from the individual level, class level, subject level and the year level.

3.2 Extent of Compliance to ISO 25010

TABLE 1
The Extent of Compliance of the Web-based Performance Evaluation System to ISO 25010.

Software Quality Standards	Mean Rating	Compliance
Functionality	4.58	Very Great Extent
Reliability	4.43	Very Great Extent
Usability	4.53	Very Great Extent
Efficiency	4.37	Very Great Extent
Maintainability	4.45	Very Great Extent
Portability	4.35	Very Great Extent
Compatibility	4.30	Very Great Extent
Security	4.73	Very Great Extent
Overall Weighted Mean	**4.47**	**Very Great Extent**

Table 1 tells that the online performance evaluation system towards outcomes-based education has been found to be compliant to a very great extent to ISO 25010 or the Software Quality Standards and to the technical needs of the users with an overall weighted mean of 4.47. As shown, the results found that security has the highest rating of 4.73 which is expected of a computerized system to safeguard the data and to keep the system secured from any illegal access.

4 CONCLUSIONS AND RECOMMENDATIONS
Student performance is one of the indicators that can prove if an institution have achieved effectiveness and quality in education. Therefore, the development of an online student evaluation system is an alternative tool that can systematically monitor the student's academic progress in terms of learning and program outcomes. The research found out that the developed online system is compliant to ISO 25010 or the Software Quality Standards as assessed by users and experts, thus, making it an excellent tool to determine student performance as regards learning and program outcomes. Correspondingly, the usability acceptance level is outstanding which means that the developed software conforms to existing technical specifications and follow the standards of systems design and development. Further, the online system will help the students, teachers and administrators to come-up with innovative ideas on how they will improve their existing learning styles, pedagogies, strategies and methodologies and their existing programs and curricula. Consequently, the results of the study would inspire the teachers to make themselves equipped with outcomes-based education concepts and strategies and focus on helping students gain the necessary knowledge, skills and competencies that will enable them to attain the intended learning outcome that have been clearly articulated. Likewise, school administrators will be motivated to review and revise the course learning and program outcomes that students are to achieve from time to time to ensure that the skills required by companies and the global workplace are met.

REFERENCES
[1] Cagayan State University Strategic Plan 2017-2022.
[2] CHED Handbook on Typology, Outcomes-based Education and Institutional Sustainability Assessment. 2014
[3] CHED Memorandum Order No. 37 Series of 2012. Policies, Guidelines and Standards in the Establishment of an Outcomes-based Education (OBE) System in Higher Education Institutions offering Engineering Programs.
[4] CHED Memorandum Order No. 46 Series of 2012. Policy-Standard to Enhance Quality Assurance (QA) in Philippine Higher Education through an Outcomes-Based and Typology-Based QA.
[5] CHED Strategic Plan for 2011-2016.
[6] Computer Hope. (2018). What is Output? Retrieved from www.computerhope.com
[7] [8] Dejager H.J and Nieuwenhuis F. J. (2005). Linkages Between Total Quality Management and the Outcomes-based Approach in an Education Environment. Quality in Higher Education 11(3), p.251-260.
[9] Handbook on Typology, Outcomes-Based Education, and Institutional Sustainability Assessment, 2014.
[10] Hsu, C. H. C., & Wolfe, K. (2003). Learning styles of hospitality students and faculty members. Journal of Hospitality & Tourism Education, 14(3), 19-27.
[11] ISO 25010(2011). Systems and Software Quality Requirements and Evaluation.
[12] Philippine Development Plan (2017). Philippine Development Plan 2017-2022 Abridged Version. National Economic and Development Authority.