

## **A Blended Learning Model for Public Senior High Schools in the Division of Laguna**

Ma. Cecilia G. Adefuin, Department of Education-Laguna, Philippines  
Neil P. Balba, Lyceum of the Philippines, Philippines

The Asian Conference on Arts & Humanities 2020  
Official Conference Proceedings

### **Abstract**

This study aimed to design a blended learning model for public senior high schools (SHS) in the division of Laguna. A descriptive-quantitative research design was considered in the study and utilized the neo-positivism for objectivity and neutrality of the research process. A survey using Mercado's eLearning readiness assessment tool and eLearning System Readiness Assessment (ELSRA) based on Mckinsey's 7S were used to collect data from respondents. Pearson r correlation test, percentage, mean, and frequency count were used for analysis. Results showed that the technical specification of eClassroom provided by DepEd Computerization Program satisfied the IT infrastructure standards for eLearning system. The proposed project team was identified with their roles and qualifications to manage the implementation of blended learning. The assessment of student's eLearning readiness has a computed mean value of 52.17% for technology access, 56.37% for technology skills, and student's attitude towards eLearning was evaluated "Almost Ready". The assessment of teacher's eLearning readiness has a computed mean value of 83.86% for technology access, 87.74% for technology skills, and teacher's attitude towards eLearning was evaluated "Almost Ready" for abilities, motivation and time management; and "Completely Ready" for teaching styles and strategies. The schools revealed that 93.33% were ready for administrative support and 83.66% for resource support to eLearning system. The division management officials agreed (68.34%) to the identified 7S that support eLearning implementation. The designed Adefuin&Balba Blended Learning Model is composed of Technology, People, and Process phases supported by K-12 SHS curriculum with continuous improvement process through monitoring and evaluation.

Keywords: Blended Learning, Public Senior High School, Elearning Readiness Department Of Education Computerization Program, Eclassroom

**iafor**

The International Academic Forum  
[www.iafor.org](http://www.iafor.org)

## Introduction

The development and innovation of academic institution is evolving in a global era because 21st century requires skills needed to acquire by the teacher and learners to cope with the demands of the global education that each country should address. Blended learning shown in Figure 1, which defines as combination of eLearning (through an online class session) and face to face class session in facilitation of classes offers an innovation of how teaching and learning can help learners acquire the required learning outcomes.

Salcito (2018) emphasized the important role of education in transforming the classroom to progress. The power of technology will help to support teaching and learning in achieving the required competencies set by the curriculum. Innovation may change the traditional way in facilitating the classes by providing new condition for students to learn.

Technology access is important to all digital tool users to enable devices to communicate with each other. To be equipped it is not limited to have access only such as access to computers/ digital tools, and internet. Users also need technology skills which include the basic computer skills, basic internet skills and literacy about software application, online tools and other productivity tools.

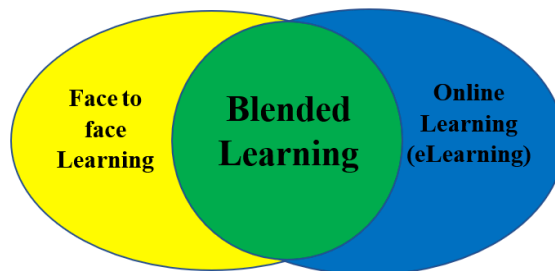


Figure 1. Blended learning

The importance of positive attitude of students and teachers to digital technology is significant to ensure that proper use and utilization of the available digital tools make them empowered to do school related activities and improve the teaching and learning process.

This research aimed to assess the eLearning readiness of the selected four (4) public senior high schools under the division of Laguna in terms of technology access, technology skills and attitude towards eLearning of the school and the readiness of management to eLearning system as basis of a blended learning model specifically crafted for public senior high schools in Laguna. The model was anchored to country's K to 12 Senior High School Curriculum which requires skills of the teachers and learners aligned to 21st Century Skills in order for them to achieve a globally competitive quality of education.

## Rationale

There is a strong claim that blended learning provided a positive effect in improving the learning outcome of certain curriculum whether it is in basic education or in higher education. But there is no study yet that provided an eLearning assessment as basis of blended learning model for public senior high schools. eLearning is one of the learning modalities for distance education.

The Philippine Republic Act No. 10650 Open Distance Learning Act published on 2014 is a policy of the State to expand and further democratize access to quality tertiary education through the promotion and application of open learning as a philosophy of access to educational services, and the use of distance education as an appropriate, efficient and effective system of delivering quality higher and technical educational services in the country.

The intention of this research is aligned with the division of Laguna trust, to integrate eLearning in the facilitation of classes to provide quality education and to support the vision of Department of Education (DepEd), which is also aligned to national agenda stated by DepEd secretary on her 10 Point agenda's vision, dreams, and direction (DepEd, 2019). It also supports the national agenda for quality education allowing ICT to be integrated which can be complemented with the Department of ICT (DICT) development plan that can offer resources necessary for schools (DICT Programs and Projects, n.d.). This endeavor is also supporting the Sustainable Development Goal 4 (SDG4) for quality education.

**Problem.** The study aimed to know the IT Infrastructure standards for blended learning implementation and eLearning Readiness state of selected four (4) senior high schools under the DepEd- Division of Laguna as basis in designing a Blended Learning Model appropriate for public senior high school in the division.

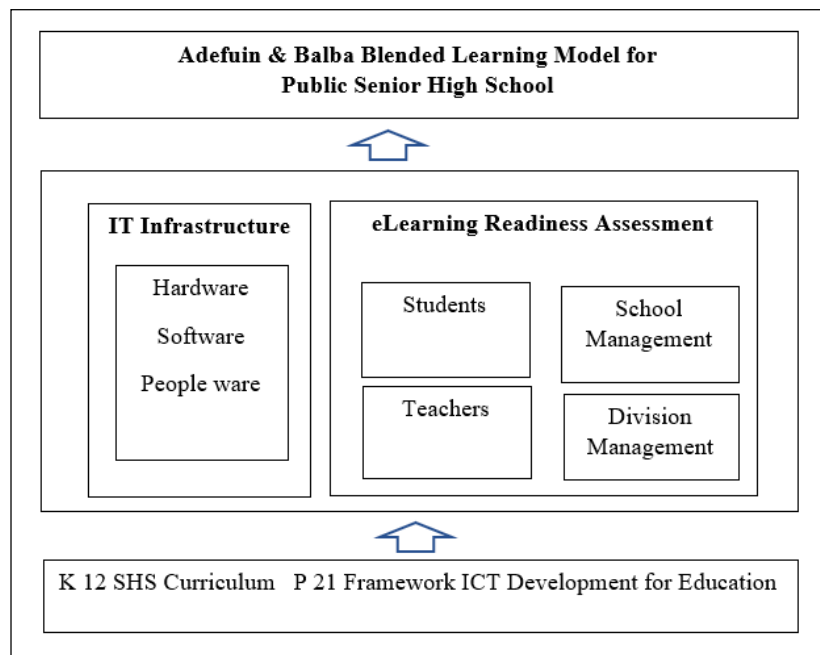


Figure 2. Conceptual framework of the study

Figure 2 shows the conceptual framework of the study which clearly illustrates the important inputs for a blended learning model which composed mainly by ICT infrastructure standards for blended learning implementation: hardware, software, people ware and eLearning readiness assessment of the schools, teachers, and students at school level and readiness level of the top management represented by the division officials. The students and teachers were assessed their technology access, technology skills and attitude towards eLearning and the institutional support using Mercado's Tool for Assessment of eLearning Readiness while the division management was assessed using Ashaher's ELSRA tool.

## **Literature review**

According to Schilling (2013), technology change is fast clients are more sophisticated, and demanding. They tend to expect more in terms of personalized design, quality and price. Changes brought by technology indeed have revolutionized everything even the classroom. Learning has extended beyond the four walls of the classroom and now takes place at home, in internet cafes, shopping malls, restaurants and in the unlikeliest of places (Red, et al. 2013). Technology provides opportunity for students to access their class online anytime, anywhere with the device that is connected to internet. This online class facilitate eLearning which is one of the important components of blended learning.

Adefuin (2017), stated that blended learning served as intervention to senior high school students which provided an innovation to support teaching-learning through integration of online class and workshop activities in facilitating classes of Practical Research 1 subject in senior high school. The intervention provided empowerment both to teachers and students which allow them to have flexible time to submit assignments, participate online discussions and take online quizzes anytime anywhere. Adefuin (2018), claimed that the class facilitation in Understanding Culture Society and Politics subject with the fix schedule access of the created online class in computer laboratory using the learning management system contributed to improvement of exam score of the senior high school students. These shows that blended learning has a positive impact to senior high school students.

A blended learning framework produced by Clayton Christensen Institute, California in California, United States of America but was implemented in a primary level or grade schools Clayton Christensen Institute (2018). The study conducted by Clayton Christensen Institute, California from the book of Michael B. Horn and Heather Staker, *Blended: Using Disruptive Innovation to Improve Schools* San Francisco: the majority of blended-learning programs resemble one of four models: Rotation, Flex, A La Carte, and Enriched Virtual. The Rotation model includes four sub-models: Station Rotation, Lab Rotation, Flipped Classroom, and Individual Rotation

A *Rotation model* a course in which students rotate on a fixed schedule or at the teacher's discretion between learning modalities, at least one of which is online learning. Other modalities might include activities such as small-group or full-class instruction, group projects, individual tutoring, and pencil-and-paper assignments (Christensen Institute, 2018). One of the type of Rotation model is **Lab Rotation** model shown in Figure 3 which provide a blended learning model that allow learners

rotate to a computer lab for the online-learning station complemented with face to face class session in a physical classroom.

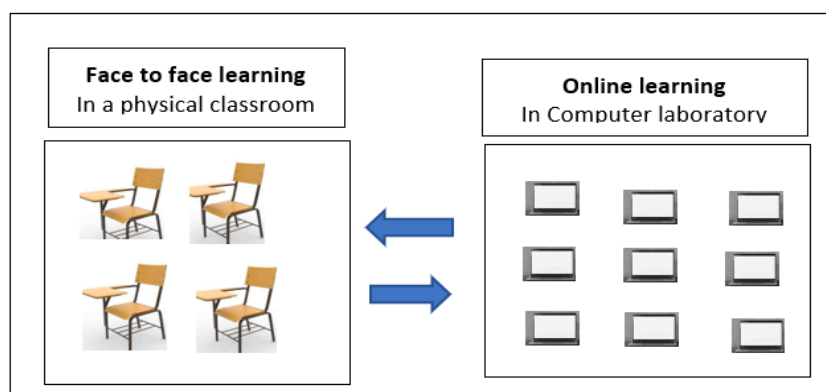


Figure 3. Lab Rotation Blended Learning model

The Department of Information Communication Technology (DICT) formulated projects that strengthen the ICT integration in education in support to National ICT Developmental agenda of the country, aside from the national broadband plan they included a provision of Wi-Fi access at no charge in selected public places including schools, government hospitals, train stations, airports, and others (DICT Programs and Projects, n.d.) . In school, internet access requires computers that can be provided by school computer laboratory.

DepED Computerization Program (DCP) aims to raise the information and communications technologies (ICT) literacy of students, teachers and school heads and to deliver computer packages for eClassroom that serve as computer laboratories in every school (Santos, 2018). It is envision that by 2022 all public schools will have computer laboratory. This computer package is also ready for internet connection which can be used for eLearning. eLearning uses LMS such as Quipper. Quipper Philippines (2017) shown support to promote the delivery of 21<sup>st</sup> century education through partnership of Japanese education technology company Quipper with Department of Education in providing the e-learning platform Quipper School to public elementary, junior and senior high schools nationwide.

## Methodology

**Research Design** The research used a quantitative type of data in formulating results. Statistical treatment was used to measure data, frequency count and percentage which were used for analysis. A test for association was done to understand the relationship of the variables between the teachers / student's attitude towards eLearning system and technology access; relationship of the variables between the teachers / student's attitude towards eLearning system and technology access/skills. Pearson r correlation was used to test the relationships of the variables with software application of Statistical Package for the Social Sciences (SPSS).

**Research Locale** The research was conducted in Department of Education division of Laguna. The four selected senior high schools for school year 2018-2019 its students, teachers, and school head in the school level and the division officials were the

respondents of the study. These include the Division IT officer, Curriculum Implementation Division-Chief, School Governance Operations Division-Chief, and Schools Division Superintendent.

**Sampling Design.** The selection of the four senior high schools was based on the following criteria:

1. Public senior high schools under the division of Laguna
2. Senior high school that offer academic track
3. Accredited schools with Level 3 of practice for the school-based management evaluated by the division for school year 2017-2018
4. Number of students

The study has 218 total respondents which composed of 4 official representatives from the division office and 214 respondents from four selected public senior high schools which consist of 157 senior high school students, 53 teachers including the teachers assign as ICT coordinator of the school, and 4 school principals respectively.

**Instruments.** The tool for assessment of eLearning readiness state used the instrument designed by Mercado shown in Figure 4 that assessed students, teachers, and school administrator while Alshaher ELSRA shown in Figure 5 was used to assess the readiness to eLearning system of the top management from the division office. The quantitative data from the validated research questionnaire was recorded for analysis and interpretation. Mercado’s eLearning readiness assessment measures the students and teacher’s technology access, technology skills and attitude towards eLearning. It also provides an institutional assessment which measure administrative support’s (commitment, policies and instruction); and resource support (financial, human, and technical support) for eLearning implementation. The ELSRA tool was crafted from Mckinsey’s 7S framework (*Strategy, Structure, Systems, Style, Staff and culture, Skills, and Shared values*). The assessment tool measured the readiness level of the top management for eLearning implementation.

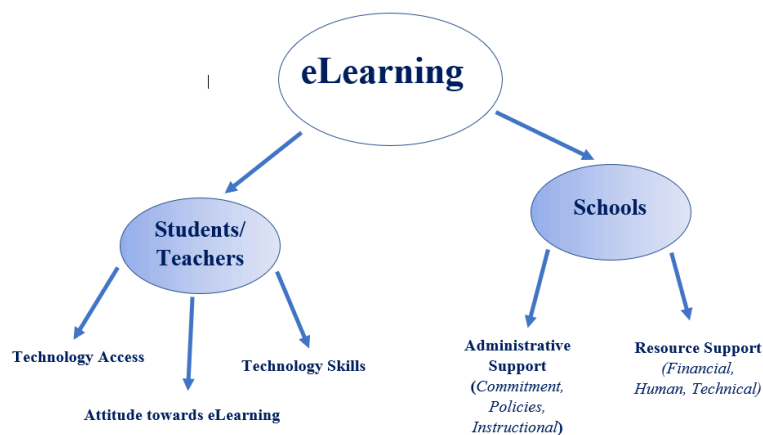


Figure 4. Mercado’s eLearning Readiness Assessment Tool

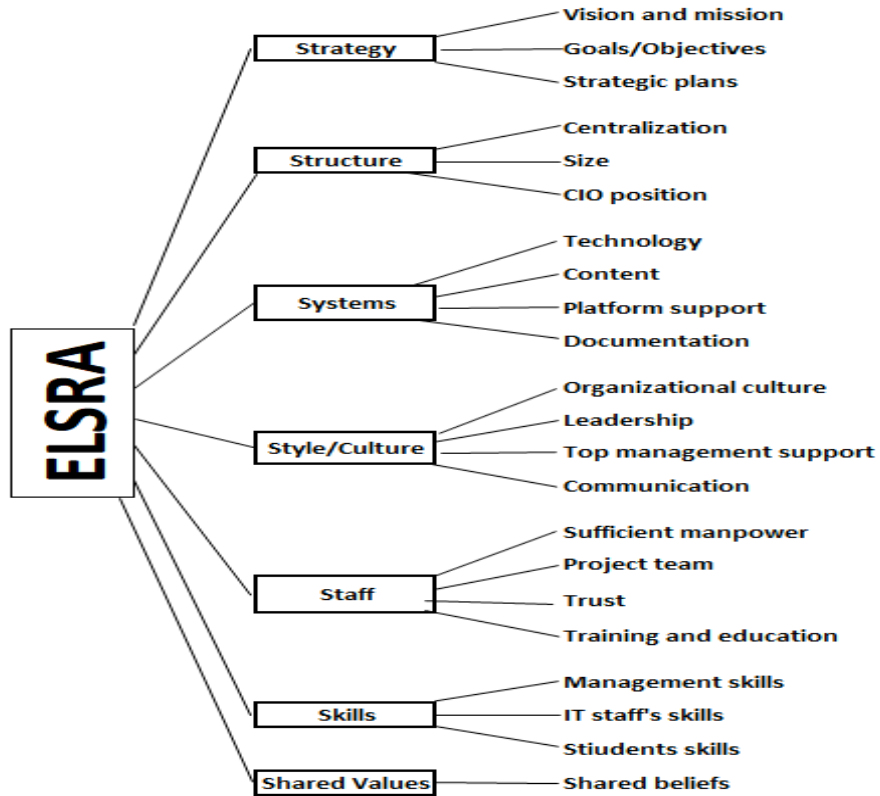


Figure 5. eLearning System Readiness Assessment (ELSRA)

**Data Gathering Procedure.** Primary and secondary sources of data were considered in data gathering. First, a thorough literature review was conducted. Survey was administered to the identified respondents using the validated instruments. Documents such as DepEd memos and orders were considered for data gathering. Data were encoded using Microsoft Excel.

## Discussion

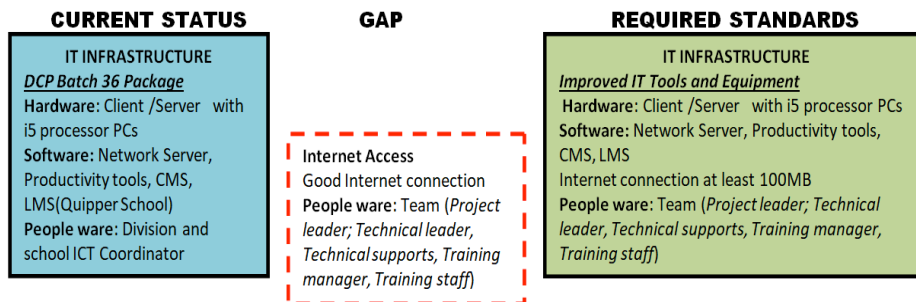


Figure 6. Gap between current IT infrastructures of the selected SHS to the required IT infrastructure standards for blended learning implementation 2018-2019

The current IT infrastructure is based on DCP Batch 36 package which has computer hardware specifications that include 8 servers, 42 thin clients, 1 UPS, 1 Acer brand computer Laptop, 1 HP Deskjet multi-function printer, 1 LCD projector and a multimedia speaker. The four schools acquired all identified tools and equipment provided by the DepEd. The given specification can be upgraded if additional

computers will be acquired by the schools. This package has a computer specification of the eClassroom which includes Windows Multipoint Server that is used to manage the thin clients that are created through a virtual machine with the NComputing networking services. This enables thin clients have all the application services provided by the server PC. The computers are complemented with Microsoft Office 2013 which include Microsoft Word, Microsoft Excel, Microsoft PowerPoint, and Microsoft Publisher that is necessary for PC Operations and serve as productivity tools both for students and teachers

Figure 6 shows gap between current IT infrastructures of the selected SHS to the required IT infrastructure standards for blended learning implementation 2018-2019. The data presented that the required standards for IT infrastructure is complemented by the DCP Batch 36 Package provided to public senior high schools. The gap in terms of good internet connection was identified and creation of team for Peopleware composed of technical leaders and training manager to ensure required technical skills both for students and teachers will be achieved and technical manager for learning content to validate content align to SHS curriculum.

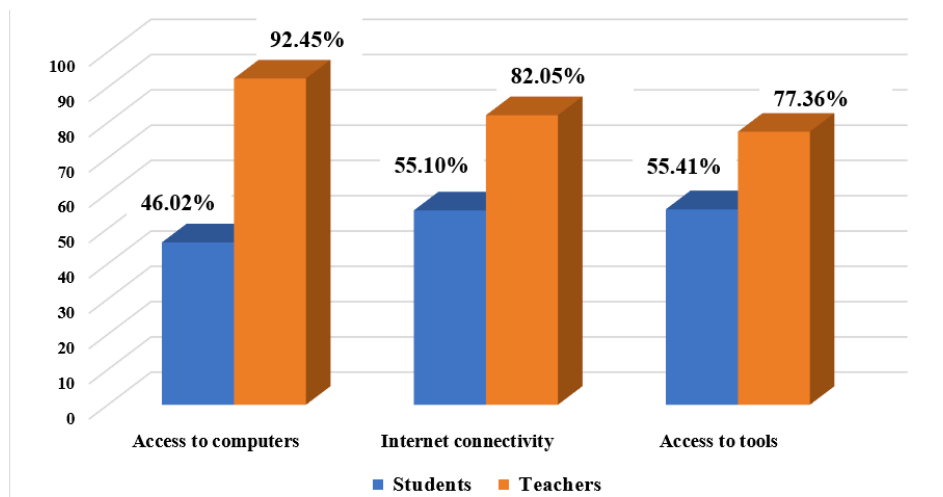


Figure 7. Technology Access of Students and Teachers 2018-2019

Figure 7 shows the technology access of students and teachers which presented a 46.02% of students and 92.45% of teachers can access the computers, while 55.10% of students and 82.05% of teachers can access the internet; 55.41% of students and 77.36% of the teachers can access the tools.



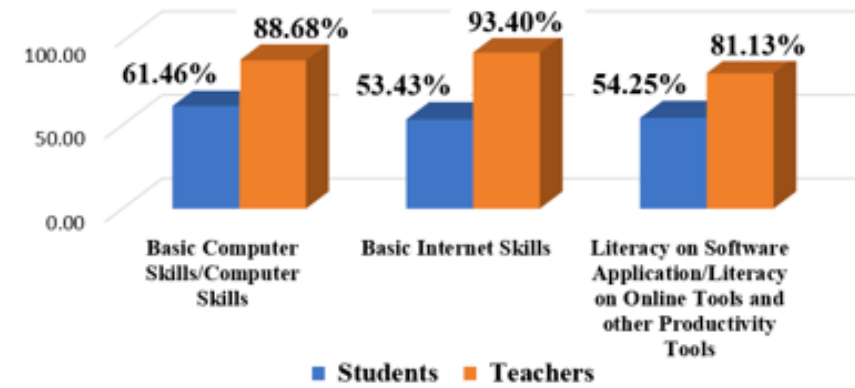


Figure 8. Technology Skills of Students and Teachers 2018-2019

Figure 8 shows the technology skills of students and teachers which presented a readiness level 61.46% of the students know the basic computer skills while 88.68% of the teachers have computer skills, 53.43% of the students and 93.40% of teachers know basic internet skills, 54.25% of the students were literate about software application while 81.13% of teachers know online tools and other productivity tools.

Figure 9 shows the readiness level of student's attitude towards eLearning which were analyzed in terms of: study habits, abilities, motivation and Time management. Generally, the students evaluated "Almost ready" with the four identified attitudes.

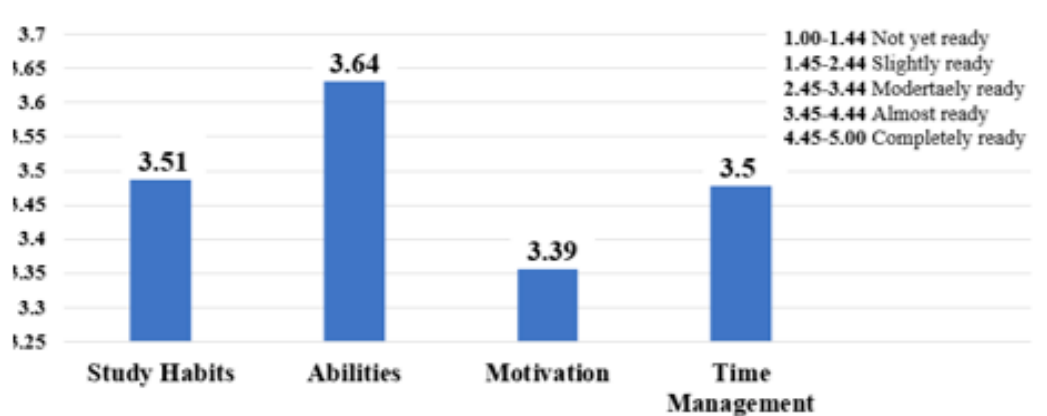


Figure 9. Readiness level of attitude towards eLearning system of the students 2018-2019

Figure 10 shows the readiness level of teacher's attitude towards eLearning which were analyzed in terms of: abilities, motivation and time management, the data was evaluated that teachers are *Almost Ready* while *Completely ready* for the teaching styles and strategies.

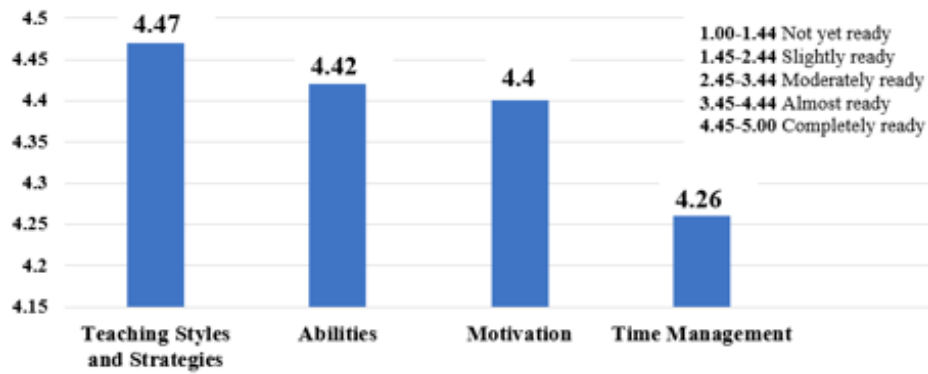


Figure 10. Readiness level of attitude towards eLearning system of the students 2018-2019

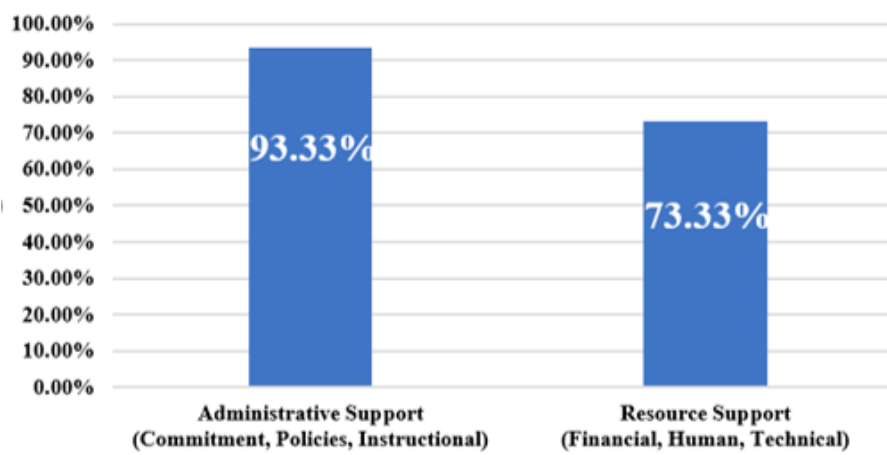


Figure 11. School level eLearning readiness 2018-2019

Figure 11 shows the school eLearning readiness level of the selected public schools which interpreted as 93.33% ready for administrative support which consists of commitment, polices, and instructional support and 73.33% ready for resource support which consists of financial, human and technical support for blended learning implementation.

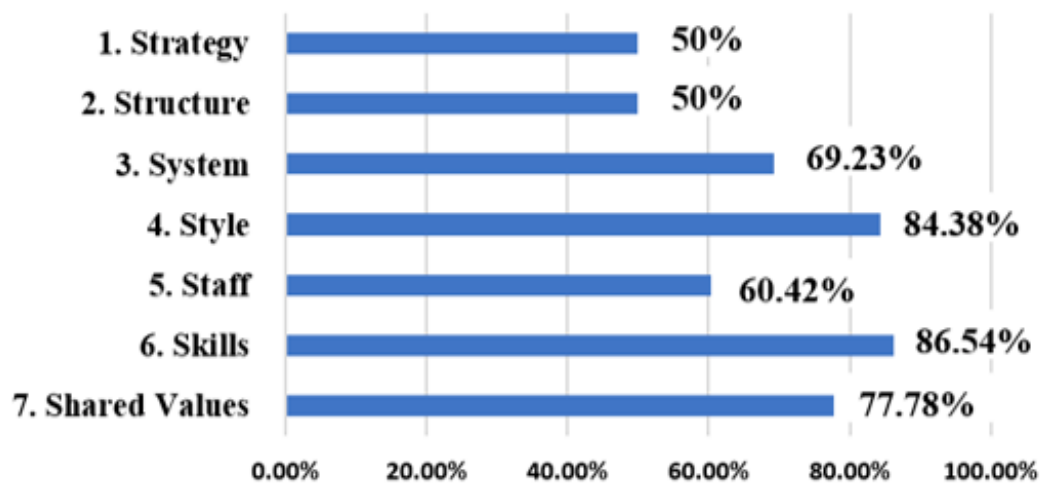


Figure 12. eLearning assessment of division officials 2018-2019

Figure 12 shows the eLearning assessment of top management officials from the divisions using Mckinsey 7S were evaluated 86.54% ready for required skills, 84.38% for style, with the lowest value of 50% readiness level for strategy and structure followed by staff with 60.42%.

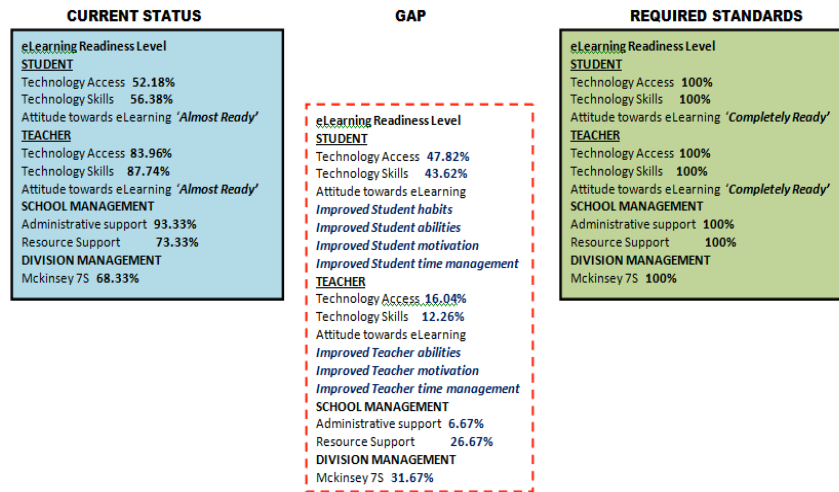


Figure 13. Gap between current eLearning status of the selected SHS to the required standards for blended learning implementation 2018-2019

Figure 13 shows the gap between current eLearning status of the selected SHS to the required standards for blended learning implementation 2018-2019. Based from the conducted eLearning assessment the gap shows a need for 47.82% additional for technology access and increase of 43.62% of technology skills of the students. Improvement for students' habits, abilities, motivation and time managements for 100% student completely ready for eLearning.

While teachers need to address the 16.04% technology access, 12.25% for technology skills and improve abilities, motivation and time management to ensure a 100% ready for teachers for eLearning.

The school shows a good support to learning system with minimal gap of 6.67% admin support and 26.67% resources support. Using 7S, division official or the top management shows support but with a gap of 31.67% needed to address primarily the strategy, Structure, and staff which were also revealed from the required IT infrastructure standards discussed earlier for peopleware.

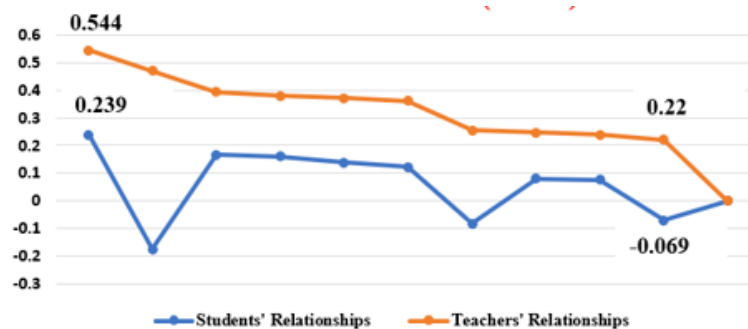


Figure 14. Relationship of attitude and technology access/skills 2018-2019 (r value)

Figure 14 shows the relationship of attitude and technology access/skills 2018-2019 using Pearson  $r$  correlation. Based on the data gathered there is a very weak positive relationships with students and teachers' attitudes toward eLearning in relation to technology access/skills with  $r$  value of 0.239 for students and  $r$  value of 0.544 for teachers as the highest rank among the data collected. It means that the teacher/students attitude towards eLearning has a weak relationship to their technology access/skills.

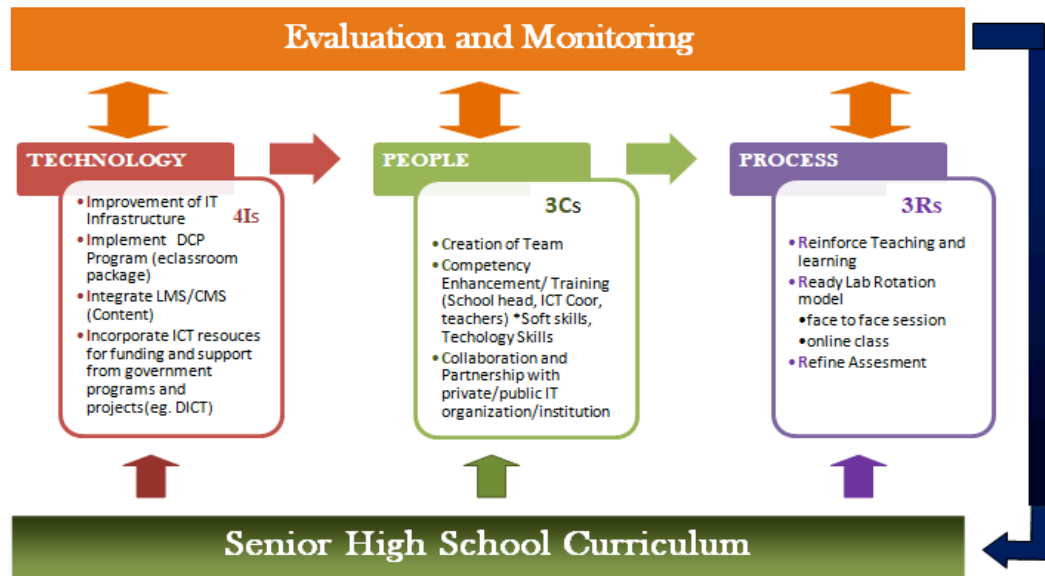


Figure 15. Adefuin & Balba blended learning model for public senior high schools

Figure 15 shows the Adefuin and Balba Blended Learning Model which composed of three phases technology, people, and process which were based on the required learning outcomes from SHS curriculum.

It will start in **Technology phase** which can be identified by **4Is** : *Improvement of IT infrastructure, Implement DCP Programs (eClassroom)* which shown in the GAP analysis the need for good internet connection, *Integrate LMS/CMS* as learning platform for the online class the identified Peopleware composed of technical manager and training manager which will ensure preparedness of teachers, students and to utilize appropriate learning content align to SHS curriculum. *Incorporate ICT resources for support (projects for resources sharing)* to improve the required IT infrastructure of the school. This phase is evaluated and monitor to ensure achievements of the target.

Next is **People phase** which enumerated as **3Cs**. The *creation of team* addresses the identified gap based on the conducted assessment. This team composed of Team head, technical manager, training manager and staff are important to improve the division strategy, structure, and staff for blended learning implementation which has a low readiness level.

*Competency enhancement/training*, the capacity building is important to all stakeholders from school head, teachers, students and even parents. This can also address the technical skills of the students which need to be improved to ensure success for blended learning implementation.

*Collaboration and partnership with private /public IT organization* is an essential example and is the partnership of DepEd with Microsoft which can be utilized for free training online that can strengthen the technical skills of the teachers. Resources /services that can be offered by other intuitions which are significant for empowering both teachers and students. This phase is also under evaluation and monitoring to ensure alignment of learnings to K-12 curriculum.

Last is the **Process phase** which enumerated in **3Rs**. The IT infrastructure is ready from Phase 1, the people is ready in Phase 2, Next is to *Reinforce teaching and learning* using the eLearning to complement with the face to face learning session using the available resources. Technology enhance class facilitation promotes ICT integration that efficiently offers 21<sup>st</sup> century learning among the students.

*Ready lab rotation*, the eClassroom of DCP project is ideal to be used by the students in engaging with eLearning as an option. The fix schedule offered in lab rotation from face to face learning session and online learning through online class ensure that students have technology access and able to develop their skills using the tools offered by eClassroom with internet access which was already prepared in Phase 1.

*Refine assessment*, blended learning offers innovation in student assessment, this requires refinement to ensure personalized assessment of the students combining the performances from face to face learning and eLearning. This phase is also evaluated and monitor for continuous improvement and will have feedback to SHS curriculum to ensure that the required learning outcomes is achieved.

## **Conclusions**

1. The IT infrastructure standards for blended learning is complemented by the eClassroom provided by DCP project to each public SHS for computer hardware and software. The high readiness level of school administration and resource support is essential to address the identified gap for good internet access and support for the creation of people to manage blended learning implementation.
2. The readiness level of teachers is higher than the readiness level of the students in terms of technology access, skills and attitude towards eLearning which is important for teachers to guide and help students to have positive engagement with blended learning implementation. The top management shows significant support to eLearning based on the 7S, and the creation of team addresses the improvement for strategy, structure and skills which can ensure successful blended learning implementation when given full support of the top management.
3. The weak positive relationship of students and teachers' attitude towards eLearning to technology access/skills will need additional test to conclude that they are related with each other but the initiative to improve technology access/skills may consider significant to improve the attitude of the students/teachers towards blended learning.
4. Adefuin and Balba blended learning model was designed based on the identified gap to ensure 99% readiness of students, teachers and schools' to blended learning mode. It also supports ICT integration in class facilitation which utilizes

eClassroom and promotes 21<sup>st</sup> century learning which will guide learners to achieve the learning competencies set by the curriculum. The model serves as a guide for the division of Laguna for a successful blended learning implementation.

**Acknowledgments:**

The author would like to express her appreciation to her parents Mr. Pablito & Mrs. Teresita Gelera for unconditional love and support, to Arvin, Marvin Josh and Angela Dez Therese for the inspiration and motivation to finish this study. The author would also want to show her gratitude to Department of Education-Laguna led by Dr. Josilyn S. Solana and Dr. Orlando T. Valverde, and Colegio de SanJuan de Letran- Calamba for the opportunity to conduct this study. Special mention to Dr. Canalyn Davidson for proofreading this paper for this submission. To God be the glory.

## References

Adefuin, MCG (2017). Blended Learning: An Intervention Approach for Senior High School Students. Voice of Asia. International Conference on Experimental Education (ICEE) Paper presentation Session 2B: E-learning. Retrieved from [https://en.teec.nccu.edu.tw/video\\_detail/44.htm](https://en.teec.nccu.edu.tw/video_detail/44.htm)

Adefuin, M. C. G. (2018). Integration of Learning Management System (LMS) in Facilitating Class in Understanding Culture Society and Politics (UCSP) Subject To technical Vocational livelihood Senior High School (TVL-SHS) Students.” International Journal of Innovative Technology and Exploring Engineering (IJITEE) ISSN: 2278-3075, Volume-8, Issue-6C2, April 2019. Retrieved from <https://www.ijitee.org/wp-content/uploads/papers/v8i6c2/F10450486C219.pdf>

Alshaher, A. (2013). The Mckinsey 7S Model Framework For E-Learning System Readiness Assessment. International Journal of Advances in Engineering & Technology, Nov. 2013. ©IJAETISSN: 22311963 Vol. 6, Issue 5, pp. 1948-1966.

Christensen Institute (2018). <https://www.christenseninstitute.org/blended-learning-definitions-and-models/>. (December 2018).

DepEd, (March 12, 2019). DepEd Cyber Expo drives digital rise of PH education. <http://www.deped.gov.ph/2019/03/12/deped-cyber-expo-drives-digital-rise-of-ph-education/>. (April 2019).

K to 12 Basic Education Curriculum. (n.d.). Retrieved from <https://www.deped.gov.ph/k-to-12/about/k-to-12-basic-education-curriculum/>

Mercado, C. A. (2008). Readiness Assessment Tool for An eLearning Environment Implementation. 5<sup>th</sup> International Conference on eLearning for Knowledge-Based Society. Bangkok, Thailand.

Programs and Projects. (n.d.). Retrieved from <https://dict.gov.ph/major-programs-and-projects/>

Quipper Philippines (2017). DepEd partners with Quipper to provide e-learning resources to public schools nationwide. [philippines.quipperschool.com](http://philippines.quipperschool.com). (May 29, 2019).

Red, Borlongan, Briagas, and Mendoza (2013). An Assessment of the eLearning Readiness State of Faculty Members and Students at Malayan Colleges Laguna. International Journal of the Computer, the Internet and Management Vol.21 No.3 (September-December, 2013) pp 20-26.

Republic Act No. 10650: GOVPH. (2014, December 09). Retrieved from <https://www.officialgazette.gov.ph/2014/12/09/republic-act-no-10650/>

Salcito, A. (2018). Empowering the students of today to create the world of tomorrow. Microsoft: Transforming Education.

Santos, J. (2018). GMA News. Computerization Program DepEd to distribute new computers in public schools. <https://www.gmanetwork.com/news/news/nation/649120/depd-to-distribute-newcomputers-in-public-schools/story/>. (December 2018).

Schilling, M. (2013). Strategic management of technological innovation. 4<sup>th</sup> edition. McGraw-hill Irwin.

**Contact email:** macecilia.adequin@deped.gov.ph