A TEACHER-DEVELOPED BLENDED LEARNING MODEL ON BUILDING READING COMPREHENSION SKILLS TO SUPPORT ACROSS-CURRICULUM PERFORMANCES

PHD DISSERTATION BY

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ABSTRACT

Reading comprehension is one of the essential literacy skills needed for all grade levels students to excel in academic studies, and for effective participation in social and cultural activities in our information and knowledge-based society. The purpose of this study was to investigate the effects of a teacher-developed literacy program using the Blended Learning environment on students’ achievements with respect to: (1) Literacy proficiency in core content subjects’ performance of English, History, Math, and Science, (2) and students’ engagement and motivation in the learning process. The study examined how twelve subject teachers at three grade levels (10th, 11th, and 12th) planned, organized, implemented, developed, and applied Blended Literacy instruction and learning strategies that focused on reading skills and comprehension in the core subjects. Through the observational inquiry approach that examined teachers’ and students’ behavior in the teaching and learning processes, the researcher sought answers to research questions related to the impact of Blended Learning on teachers’, students’ and parents’ beliefs on curriculum design, instruction, learning in each of the components of Blended Learning. After an extensive analysis of qualitative and quantitative data of student academic performances in four core subjects, the research findings concluded that students’ performance progress using Blended Learning Methodology was positively related to their achievements in every subject. Seventy-seven participant students demonstrated a remarkable performance record, showed achievement gains of five to sixteen times, and statistical significance of \( p\text{-value} < .000 \), in every subject at the end of the school year 2013-2014. Students demonstrated significantly better on overall mean scores in Term 2 over Term 1 as both teachers and students gained proficiency in the use of the Blended Learning model. This study confirmed
the current conclusion by most studies at higher educational institutions that Blended Learning increases class participation, inspires deeper intrinsic motivation, and improves the quality of teacher and student commitment.
DEDICATIONS

My research work is dedicated to Saint Josemaría Escrivá, the founder of the University of Navarra, who inspired a world-class institution that embraces both the humanistic and scientific inquiries of universal truths at the service of humanity. In addition, this research study is dedicated to all educators who are engaged in the noble profession of educating and teaching.
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CHAPTER 1: INTRODUCTION

1.1 Overview

This thesis provides an in-depth account of a blended learning research project undertaken at Metro Academy, New York. This project was designed and initiated by the author of this PhD dissertation, who is the Math and Science Departments’ Supervisor, and who has also been responsible for several other initiatives related to technology innovations at the Metro Academy, where she is the Chair of the Instructional Technology Committee. The project was then extended to include the Humanities Department of English and Social Studies when these teachers expressed their strong interest in contributing as participant instructors in the research study. The researcher who supervised this study was therefore involved in supervising the development of the subject curriculum and was responsible for providing professional development for all subject teachers according to the New York State performance guidelines. Moreover, she was also able to conduct research into student, teacher and parent perceptions as the project progressed, and to analyze the results obtained by students at the end of the year. This thesis thus provides important insights into the implementation of blended learning projects at high school level, beginning with a thorough literature review, going on to describe the design and implementation of the project, and exploring its impact through a variety of research methods, complementing quantitative data with qualitative insights from interviews with stakeholders.

The blended learning literacy program is a pedagogical and technological initiative that incorporates theme-based, participatory, and hands-on learning. It is intended to focus on five key goals: 1. Improve students’ academic performance and mastery based on national standards
in reading, mathematics, science, and writing. 2. Encourage and reinforce positive attitudes towards study and work. 3. Promote positive values, character development, and healthy lifestyles. 4. Foster the desire to make positive contributions to the community through volunteer work. 5. Promote a strong sense of community service participation, and collaboration among all participants and stakeholders. The humanities teachers of English and Social Studies responded positively to this program, which was to be hosted by the blended learning platform, and they were delighted to have this opportunity for first-hand experience. The mission of this blended program was intended to respond to individual needs and interests by providing a learning environment that was engaging and intellectually rich. In terms of pedagogy, the instructional model is focused on personal nurturing, one-on-one tutoring, reading aloud in small groups, reading buddies, peer coaching, and team learning. The course is led by the action team, which consists of teachers who meet the researcher regularly to facilitate collaboration and cooperation. The program evaluation team consists of the researcher, the literacy coach, and participant teachers as well as parents. The data collection process included surveys administered to students, teachers, and parents, conducting interviews, making observations and holding focus group sessions, as well as obtaining standardized test scores.

The expectation was to achieve maximum effectiveness in implementation, positive student outcomes, and to maintain a comprehensive mix of academic enrichment, homework help, recreation, art, sports, community service, and cultural activities. As every member of the team believed that literacy improvement across the subject curriculum was an important agenda for students’ overall performances in the core subjects, it became easy to draft the overarching thesis statement for this blended learning project, which is: How teachers can design an optimum
blended learning model to support improved literacy skills in reading and content comprehension in the four content areas of English, Social Studies, Math, and Science.

1.2 Research Study Setting

The researcher chose Metro Academy campus for the context of this case study because the school has a definite educational mission, constructive learning environment, and teachers who share the same vision regarding educational values, objectives, and goals. Most important of all, teachers are interested in experiencing new innovations to improve students’ performances in the content subjects. Metro is a college preparatory school designed to attract students who have selected a liberal arts curriculum with an emphasis on the humanities. The school is located in an artistic neighborhood surrounded by art and designer shops and several well-known museums. The student population of 650 comes from a multicultural region of New York City. The high school grades range from 9-12 and ages from 14-18 years old. There are 49% males and 51% females studying at Metro Academy.

The mission of the school is dedicated to educational excellence, academic achievement, public service, and technology integration in the curriculum. These goals are achieved based on a holistic philosophical approach by providing a learning environment that nurtures student growth and academic success. All students follow a college preparatory program from grade nine and continue throughout the high school years to prepare them for post-secondary study and professional work. School programs emphasize not only basic literacy but also conceptual, critical thinking, and aesthetic skills in all content subjects. Students have opportunities to participate in all forms of extra-curricular activities and sports. They are encouraged to take advantage of and
to be enriched by activities such as concerts, visiting museums, cyber experiences, and cultural exchanges with international students abroad. Several internship programs, affiliated with private companies, offer college collaborative opportunities including New York University and Columbia University which are located in New York City. A holistic academic program of education includes core content subject studies, character building, and study habit workshops conducted by teacher advisors. Various Physical Education programs are fully integrated into the curriculum to ensure that each student has a chance to fully develop good health as well as intellectual, emotional, and social growth. Utilizing the rich cultural and ethnic diversity of the student body, coupled with the responsibility to provide the best education for all students to be successful in the information and performance driven environment, the school is open to innovative programs to improve and increase learning opportunities for the entire student body. For the disadvantaged students and non-native Americans, appropriate academic intervention services and classes are offered and integrated into their schedules in a timely and coherent manner. Within the framework of a college preparatory environment, each subject department seeks to develop mature, knowledgeable, information-literate and life-long learners to be equipped and ready to meet the challenges of the 21st century.

Gradually, the blended concept of instruction and learning has gained tremendous popularity at Metro campus. The staff widely endorses the use of Internet, World Wide Web, and digital technology tools as innovative ways for teachers to effectively create new course designs, digital curriculum, interactive lesson plans, and multimedia learning activities in both face-to-face and online platforms. Furthermore, teachers generally believe that the quality of instruction and learning could be enhanced and highly improved by combining traditional classroom methods
and online instruction experiences. Since 2010, most schools in New York City have been making progress in the process of preparing the online curriculum for all subjects. However, even though the educational portal was in place in some schools, the lack of adequate and appropriate curriculum for each content subject and induction training materials for teachers and students during the program implementation process often resulting in failure to give a quality time to students’ learning experiences. As observed by many teachers, the online lab is often supervised by paraprofessionals with limited content expertise (Staker et al., 2011). From this perspective, teachers at Metro wanted to create a tailored-designed blended learning literacy program in 2014 after the experience of a pilot study conducted in 2013.

1.3 Main Case Study Research Team

The researcher began this research project at Metro by extending a formal invitation to teachers, parents, and students in order to obtain their voluntary participation in this undertaking. Upon the request of the participant members, pseudonyms and generic names were used for the school and participant students and teachers. Teachers, students, and parents expressed their consent to the researcher’s invitation. The researcher replied to each participant teacher and family with a thank you letter. Both letters are found in (Appendix A and B).

Upon receiving the signed commitments from all partakers of this project study, the researcher began organizing a fourteen-member working team consisting of the researcher, the Literacy Coach, and twelve content subject teachers from grade levels 10th, 11th, and 12th. The Literacy Coach is a licensed certified teacher of English and Foreign Languages. All participant teachers are New York State licensed and certified in their content subjects. The researcher is a
New York State licensed Supervisor of Instruction and Administration Organization. In this case study, the researcher has been involved in every step taken in the research process. A very significant part of qualitative research was the interviewing component where the researcher played a key role in framing the interview conversations (Fink, 2000), following the seven stages described by Kvale (1996). By choosing a case study design and using a mixed research methodology, the researcher was able to obtain detailed and specific information about the staff’s opinions and concerns, students’ opinion, behaviors, values, and attitudes, which are all keys to the understanding of the research findings and the effectiveness of the blended learning literacy program.

1.4 Research Project Process

This research project began in August 1, 2013 and ended in December 1, 2014. Detailed descriptions of the four stages of the research project development are found in Chapter 3, Sections 3.5, 3.6, 3.7, 3.9, and 3.10. The dates of the data collection timeline and schedule can be reviewed in Section 3.10.1, Chart 11. The following diagram shows the sequence of the four stages of the research project implementation process (Figure 1).
The following are highlights of the continuous operation in each of the stages:

**Stage 1: Preparation and designing**
- Identify students’ academic needs
- Identify performance standards, rubrics for assessment, and set yearly goals
- Identify and obtain content curriculum to be hosted in the blended learning platform
- Identify various blended learning models and produce a teacher-designed blended learning model most appropriate to incorporate the literacy program
- Identify learning and pedagogical philosophy to determine how teachers will adopt the blended learning strategies
- Identify teachers’ professional development, technology and training needs
- Identify students’ technology and training needs

**Stage 2: Developing and implementing**
- Host parent, teacher, and student orientation
➢ Hold monthly meeting to inform student instruction, model and share best teaching practices in the blended learning environment

➢ Develop a plan to ensure professional development for teachers and training for students

➢ Develop a plan and schedule for data collection

➢ Check with the program office to ensure that teachers and students are enrolled into the blended classes

➢ Researcher conducts interviews, class observations, and participates in focus meetings from September 6 – May 30, 2014

Stage 3: Assessing and Evaluating

➢ Provide ongoing professional development for teachers, and ensuring that students are receiving regular technology training

➢ Use performance data to monitor student progress

➢ Analyze data to inform student achievement

➢ Collect data from interviews and class observations to inform student instruction

➢ Collect end of term 1 and term 2 grades for data analysis

Stage 4: Documentation of the research results

➢ Review interview and observation notes

➢ Organize data using the SPSS statistical software

➢ Summarize the interviews and survey reports using Excel graphs for reporting and analysis purposes
1.5 Organization of the Research Study

The organization of this research consists of six chapters. Chapter 1 is an introduction to the research study, which begins with an overview of the research, and then a description of the research setting, process, and the roadmap for the organization of the report. Chapter 2 is the review of literature which includes these topics: the overview; exploration of the role of language literacy in the content areas, the e-learning culture in global education; the emergence of blended learning in High Schools; learning theories that guide the blended learning designs; instructional strategies and learning skills; organization of the blended learning models; pedagogical factors in blended learning designs; key beneficial features of blended learning; challenges of teaching with the digital curriculum; teachers’ leadership role in the blended classroom; blended learning supported literacy program, learning virtues in support of learning success in the blended classroom; parents’ involvement in the blended classroom; and finalized with a summary of the principles of blended learning design, and formulation of the research questions. Chapter 3 relates the methodology used in this research which contains these main topics: research design overview; rationale for a mixed research approach; pilot study methodology and the main study; the designing of the blended learning literacy course site; development of the blended learning literacy content, the blended learning environment; the online digital curriculum; the implementation process, evaluation of the blended learning literacy program; data collection process; data collection instruments; the students’ performance grades from Term 1 and Term 2, and completed with a brief summary. Chapter 4 reports the findings addressing research questions 1 to 6. Chapter 5 is on the discussions of the qualitative and
quantitative results, and factors which contributed to the case study outcomes. Chapter 6 presents the summary, conclusion, limitations, and implications of this study for future research.
CHAPTER 2: LITERATURE REVIEW

2.1 Overview

The purpose of this literature review is to provide an overview of some recent bibliographies on the main theoretical and practical aspects of literacy education and blended learning, which form the background to the practical study carried out in this PhD thesis. Since the area of educational technology has undergone rapid transformations over the last 15 years, this literature review will focus mainly on recent publications covering the integration of technology in learning programs. However, since all educational programs have to be underpinned by sound theoretical constructs, the review will also include a brief account of other, more classical principles and approaches that are relevant to the design of the blended learning program that forms the object of this study.

This review thus starts from some recent studies related to the various components of the proposed research questions, which are: 1. How can the use of blended learning technology in the blended classroom create differentiated instructions that are helpful in building students’ ability to improve literacy skills? 2. How can blended learning technologies support students in content subject learning? 3. How can technology support teachers in designing lessons in a blended learning environment that increase students’ participation and engagement which are important ingredients in the learning process? 4. What perceptions do students and teachers have towards the technology mediated-instructional blended learning platforms that influence the learning experiences?
Blended learning, defined as the combination of face-to-face and technology-enhanced instruction, is considered by many researchers and educators as the desirable method of course content delivery for learners to access education (Staker et al., 2011; Kibria, 2014; Vander Ark, 2014; Jeffrey, Milne, Suddaby & Higgins, 2014), and for empowering learning experiences within Internet-based, technology-rich environments (Poon, 2013; Cheung & Hew, 2011; Bauer, 2001; Cameron, 2003). Numerous studies have shown that instructors are in favor of choosing the blended learning method for instruction in order to “take the best of both face-to-face delivery and e-learning based delivery” (Porter, Graham, Spring, & Welch, 2014, p. 397). The blended learning environment not only influences but also enriches teaching quality (Poon, 2013). It seems that the majority of students enjoy blended learning because they treasure the freedom of having alternative ways of expressing themselves, such as the opportunity to use self-regulated time to write during independent study sessions, and the occasion to verbally interact with peers and instructors in the face-to-face classroom (Garrison & Kanuka, 2004).

This literature review therefore provides an overview of the theoretical and practical basis for this research, encompassing an account of various themes related to blended learning, including its background, key principles of instructional designs and blended learning models, pedagogical and learning theories, and their applications in the e-learning environment. Additional reviewed topics include the role of teachers and students in the digital learning process, and theoretical and empirical studies on the effectiveness of blended learning in teaching and learning related to core subjects.

This literature review will thus provide a deeper understanding of why contemporary educators are favoring blended learning methodologies for designing their subject courses, and
how teachers build effective blended learning models for the goal of improving literacy comprehension for content area subjects. A special effort is focused on exploring the benefits, advantages, and challenges that teachers may encounter in the process of incorporating blended learning in teaching and learning. Since the empirical findings related to blended learning are quite substantial in higher education settings (Porter, Graham, Spring, & Welch, 2014), the aim of this chapter is to identify the benefits of blended learning as experienced by higher educational institutions, and to capitalize on this body of research findings to establish guidelines for helping teachers to redesign a literacy program through the incorporation of e-learning technology into classroom-based instruction in high school settings.

2.2 The Role of Literacy in the Content Areas

Since blended learning and literacy in content areas are the objects of this study, this section will explore the rationale behind the research interest in choosing the blended learning platform for developing a Literacy Program for use in high school. It has long been known that literacy, the ability to understand and use the written language, is one of the most important aspects of formal education.

There is a huge literature base on reflections about the meaning and interpretation of literacy. The most common definition educators use to define the concept of literacy is the ability to read, write, speak, listen, and think critically in reading a piece of literature. Stock (2012) defined literacy to mean a person’s ability to use language for teaching and learning, and for the purpose of comprehending, composing, and communicating meaning and knowledge (Par 1). A more specific definition defined literacy as “A set of multi-faceted social practices that are shaped
by contexts, participants, and technologies” (NCTE, 2011, p. 2). From the perspective of secondary education, White & McCloskey (2003) defined literacy as a task-based and skills-based function in task performances. These task-based literacies are focused on the knowledge and skills, which adolescents must acquire and possess in order to effectively engage in learning academic subjects. These authors clarified that these task-based skills include both word-level reading skills and higher level literacy skills.

It is commonly agreed among educators that today’s work experience requires not only the traditional types of literacy, but also is extended beyond this to embrace scientific literacy, economic literacy, technological literacy, and visual literacy. These competences, though undoubtedly important, appear to extend the notion of literacy to cover almost the whole of the schooling process, so that the concept of literacy ultimately merges with the concept of education itself. For our present purposes, we take a narrower and more classical view of literacy, understanding it as meaning the reading and writing abilities needed to function in academic and professional contents. Along this theme, one particular aspect of literacy is what could be called “disciplinary literacy,” which facilitates learning in particular subject areas. National Council of Teachers of English (NCTE, 2011) distinguished college level disciplinary subjects somewhat different from secondary content area subjects. “Content areas or school subjects in secondary schools are organized differently – social studies, for example, does not exist as a discipline although it is a high school subject – and school subjects often operate to constrain or control how knowledge is presented, while disciplines emphasize the creation of knowledge (p. 2). In secondary schools, most teachers would agree that literacy skills are essential in reading content materials; they recognize the need to broaden the effort of helping
students to improve literacy ability to include all content subjects in order to prepare students for tasks they will face both at college and later at work (Hellen & Greenleaf, 2007). Consequently, there is a strong emphasis in schools on promoting various aspects of a student’s literacy development in content subjects. Hellen & Greenleaf again stressed that content subject learning must be grounded on fundamental literacy skills. Students’ content knowledge is strengthened when teachers integrate discipline-specific literacy into instruction and learning. Therefore, content subject teachers share the important responsibility of helping students to apply literacy skills at grade level reading to achieve best results for content comprehension:

To become competent in a number of academic content areas requires more than just applying the same old skills and comprehension strategies to new kinds of texts. It also requires skills, knowledge, and reasoning processes that are specific to particular disciplines (Heller & Greenleaf, 2007, p. 10).

Along this line of thought, Heller & Greenleaf (2007) pointed out that “Every academic discipline or content area has its own set of characteristic literacy practices” (p. 7). They stressed that “to enter any academic discipline is to become comfortable with its ways of looking at and communicating about the world” (p. 8), and it is helpful that teachers “teach comprehension strategies, text structures, and word-level strategies while students are engaged in reading challenging, content-rich texts.” These authors believe that the goal of content instruction is to help students at different grade levels to master “the knowledge, procedures, and skills of the academic disciplines that rule the secondary school curriculum, and which serve as the gatekeeper to success in college, work, and other facets of adult life” (p. 32). In accordance with
this rationale, teachers should try to improve adolescent literacy instruction based on the requirements of each content subject by integrating reading and writing more fully into the content areas in order that students maximize mastery in all disciplines (p. 32).

In view of the above perspective, low literacy performance as indicated in assessment tests during the past ten years is a troubling sign for teachers who teach content subjects. “Despite the growing need for literacy, especially higher-level literacy skills, assessment data suggest that adolescents today read no better, and perhaps marginally worse, than a generation ago” (Shanahan & Shanahan, 2008, p. 42). According to the National Assessment of Education Progress (NAEP), the primary federal institute for collecting and analyzing data related to education in the United States, the 2012 report showed that the average reading performance score of 12th grade students did not achieve any significant change over the 2009 NAEP reading performance report (Merrow, 2014). Again, the current 2015 NAEP report indicates that reading performance of 12th grade students is not measurably different from that of 2013 (Kena et al. 2015). In other words, reading performance has remained stagnant for secondary school students in the United States over the past few years. These reports may not necessarily imply that some schools are failing overall, but rather they should serve as a wake-up call to subject teachers that improved literacy proficiency is one of the main challenges for language and academic subject achievement. In the High School Literacy Statistical Fact Report, it clearly underscores the point that, “the importance of being literate has only increased over the decades and stands to become even more important in the future” (Rutenberg, 2009, p. 1). Furthermore, “current jobs require employees to integrate new information with the old, critique opinions,
understand context, and synthesize new ideas – all high-order thinking skills facilitated by being fully literate” (2009, p. 1).

Even though there is a huge literature based on the definition and interpretation on the meaning of literacy in 21st century contexts, McNabb (2005) pointed out that “when it comes to a theory about what works with regard to technology integration into English Language arts, the research basis has a long way to go” (p. 113). Indeed, there is a challenge for today’s e-generation as to what a “literate person” should possess (U.S. Dept. of Education, 2010; U.S. Department of Labor, 1988; Jurmo, 2004; White & McCloskey, 2003; Stock, 2012; NCTE, 2011). To ensure that students graduating from high schools are prepared to thrive and be potentially productive in this century’s hi-technology and global-based society (Joseph, 2008), school administrators and teachers are eager to re-define and upgrade the role of literacy in content subject instruction in K-12 education. In preparing students for college studies, work, and responsible citizenship, a low level of proficiency in reading and writing is insufficient. There is a need to acquire advanced disciplinary literacy skills applicable to master texts with more complex structures in content subjects of math, science, and history (Shanahan & Shanahan, 2008; Heller & Greenleaf, 2007). Above all, the English language has been accepted as the common language in both the academic and non-academic fields for international communication. “Ambitious students will hope to be able to participate in their professional discourse communities, and to do so fully, they will need both to speak and to write well in English” (Breeze, 2012, p. 3). Based on these literature findings, literacy skills are perhaps more important now than ever before, since “adults will read and write at more than any other time in human history; they will need advanced literacy to perform their jobs, run their households, act as citizens, and conduct their
personal lives” (Moje et al., 2000, p. 1). In other words, literacy skills are essential for students’ academic studies, future career, and professional progress. It is therefore logical to ensure that school children in the United States acquire highly developed literacy skills in the English language to improve learning in content areas.

There are various approaches as to how content area literacy skills can be supported. One of the most important strategies suggested for reading is to set an instructional or objective goal for reading. More and more, teachers use the blended classroom methodology approach to literacy instruction which stresses that reading assessment should be directed to either reading-to-do, such as looking up information, or reading-to-learn, such as researching information for an intellectual activity (Sticht, 1976, 1988). Developing this idea, Clark & Rubold (2006) pointed out that the reason for the reading exercise could be for pleasure, to acquire knowledge (Clark & Rumbold, 2006), or to learn content materials (Lattimer, 2010). Whatever the purpose is, the priority should be directed to use the appropriate strategies to achieve the intended goals. Using the appropriate strategies enables the reader to read with comprehension, make sense of the words, make connection with the texts, and be able to use the information properly. In a slightly different approach, Trehearne & Doctorow (2004) explained the meaning of ‘thoughtful literacy’ by distinguishing the difference between critical thinking and critical literacy. Reading and thinking must happen at the same time. “Critical thinking involves logical and reflective thinking and reasoning” (2004, p. 100), which moves the person to ask the appropriate questions for understanding, and to relate the text to other issues. “Critical literacy requires critical thinking with a specific focus on social issues and social justice” in mind (2004, p. 100). These authors also suggested four ways that teachers can use to support students’ reading comprehension:
1. Provide sufficient time for reading in class. 2. Give explicit strategy to guide the reading process. 3. Enrich instruction with meaningful discussions. 4. Offer writing opportunities along with guided reading practices (Trehearne & Doctorow, 2004, p. 101).

Helping students to improve their reading comprehension skills at the high school level is important because students are moving away from less complex lower-grade readings and going forward to more complex content materials at higher-grade levels (Marin & Halpern, 2011). Although different approaches exist, it is generally recognized that there are seven most essential basic literacy strategies for supporting students towards developing literacy skills for across-curriculum study: (1) making connection with prior knowledge, (2) asking questions about the text, (3) forming predictions or drawing inferences, (4) prioritizing the information, (5) creating a mental picture, (6) re-reading for better understanding, (7) and synthesizing information (Pearson & Gallagher, 1983), and asking students to summarize the reading in their own words (Adler, 2004).

However, other issues often complicate reading improvement. For example, high school subjects require higher degrees of understanding of the content materials for building a solid body of knowledge in preparation for college work and for life (Denton, 1997). Many empirical studies revealed that most content teachers feel the need to integrate discipline-specific literacy into the instruction to strengthen content comprehension, but do not have the instructional training necessary to support students’ literacy skills development in content knowledge (Collins & Dallat, 1998). To address the many issues students face regarding reading comprehension, it is recommended that content teachers concentrate their efforts on key factors that cause this problem such as insufficient vocabulary and in-depth knowledge of the content materials.
(Trehearne & Doctorow, 2004), lack of ‘text interest’ or not having enough motivational drive to try to understand what they are reading (Coan, 2007). Another obstacle identified as causing slow improvement in reading comprehension is that teachers are often short of time for covering the required curriculum and therefore fail to pay sufficient attention to students’ comprehension of the content of the materials. In general, Hellen & Greenleaf (2007) explained that one major challenge that teachers face is the time required for grading assignments and projects. Both teachers and students are often challenged with not having sufficient teaching time to cover the entire course curriculum, and students are unable to complete all the reading assignments for each unit. In the non-humanities subjects, sometimes teachers may not have enough time to read through all the exercises and activities before assigning them to students. As a result, teachers could be asking students to do work which would take too long or is too complex to complete in order to meet the turn-in deadlines. From the students’ perspective, “every academic subject area presents students with its own distinct challenges” (Hellen & Greenleaf, 2007, p. 19). For these reasons, many teachers are investing in digital technology, not only as instructional and learning tools, but also for facilitating or replacing some of the time-consuming human tasks such as grading, taking attendance, and tracking students’ performance progress. Blended learning educational portals would seem to offer broad opportunities in this area.

2.3 The E-Learning Culture in the Blended Classroom

E-learning is now understood to play an important role in students’ education, but the ways in which changes in the medium of instruction affect the learning experience at different
levels are still not fully understood. As early as the mid-20th century, Innis (1951) predicated that modern technology would be the new medium of social dynamics of the new century:

A medium of communication has an important influence on the dissemination of knowledge over space and over time, and it becomes necessary to study its characteristics in order to appraise its influence in its cultural setting” (1951, p. 33).

Graham, Woodfield, & Harrison, (2013) have all described in different ways the characteristics and the roles new technologies play in the academic, business, and professional world. In the field of education, concretly, e-learning is currently bringing about revolutionary changes that are transforming the ways people learn in many different contexts. However, all the dimensions of this transformation have not yet been explored, and there is a shortage of medium- and large-scale empirical research on the multiple effects of e-learning and its combination with more traditional teaching methodologies.

E-learning can be defined as “the use of computer and Internet technologies to deliver a broad array of solutions to enable learning and improve performance” (Ghirardini, 2011). Under the umbrella of digital education, e-learning is a technology-supported learning system, which includes computer-based, web-based, virtual learning, virtual classrooms, and any similar forms of digital collaboration (Chaudhary & Ahmad, 2000). Graham (2006, 2013), and Dzubian & Moskal (2011) called the new phenomenon of e-learning the ‘new tradition model’ and the ‘new normal’ in course delivery. No doubt, a message initiated in the classroom or workplace can reach the most remote corner of the world instantaneously via digital transmission. Technological innovations and their fast development have the impact of accelerating the globalization
processes in every facet of life. The global agenda practically permeates every daily activity in homes, schools, university campuses, and in professional work (Held & McGrew, 2007; Bruff, 2005; Tikly, 2001). It can be seen that in today’s global development, humanity has created a new path for international order and more ways wherein people exchange ideas beyond the academic campuses (Altarejos, Sedano, & Fontrodona, 2003, p. 23). In any setting, globalization “has the effect of increasing the interdependence and interconnectedness between various people, cultures, ethnic groups, government entities and organizations from different locations into a wider global arena” (Litz, 2011). Rosado (1994) emphasized that in our fast-paced and globalized society, people of various cultures are brought closer to each other. Likewise, Altarejos et al. (2003) described some of the features of globalization that characterized the so-called ‘Era of Globalization’, and pointed out that globalization creates a favorable platform for human development and enables people to achieve a genuine quality of intellectual life. This is a challenging but exciting time for education institutions and in particular for teachers who are entrusted with the role of educating children who will be the future citizens of this globalized culture. The new challenge for educators today is not only to support students with new technologies and recommendable resources, but also to teach them how to use these means towards accomplishing learning goals in new learning environments (Naismith et al., 2004). In summary, one tangible reality is that globalization and e-learning, together with the advancement of information communication technologies, are far reaching in shaping educational beliefs and creating a new academic and social culture in the 21st century for teachers, students, and professionals.
E-learning is now the current trend in education in higher education as well as in secondary schools. In the opinion of Chinnammai (2005), “The introduction of technology into the classroom is changing the nature of education delivery, and is gradually giving way to a new form of electronic literacy” (p. 2). This ongoing process is thought to offer various advantages over more traditional education methodologies. Educational technology via electronics learning (e-learning) not only facilitates the learning processes but also increases the opportunities for greater content enrichment, which could be obtained from a wide range of knowledge-based resources. E-learning operates through the fast speed of electronic means to access learning materials and instructions for learning purposes. The convenience and flexibility of e-learning, and its multi-channel capabilities for communicating information, provide effective educational tools for preparing students to thrive academically not only in their studies, but also in preparing them for the information-saturated and fast-paced global market (Strother, 2002).

E-learning empowers teachers by offering multi-channels and unlimited resources for instruction and learning (Bixler & Spotts, 2000). This is a phenomenon that did not previously exist in the traditional classrooms. The online courses using Internet-based technology are driving a new instructional paradigm enabling multimedia channels of meaningful learning opportunities for learners in the academic campuses (Reigeluth, 1992; Dziuban et al., 2006). Alonso, López, Manrique, & Vines (2005) emphasized that the e-learning paradigm is beneficial for improving the quality of learning. In a similar manner, Barr & Tagg (1995) advocated “the aim in the Learning Paradigm is not so much to improve the quality of instruction, although that is not irrelevant—as it is to improve continuously the quality of learning for students individually and in the aggregate” (p. 15). Garrison & Kanuka (2004) believed that the transformation power of
blended learning is “the ability of online learners to be both together and apart, and to be connected to a community of learners anytime and anywhere, without being time, place, or situation bound” (p. 96).

In practical terms, the e-learning paradigm represents the use of multimedia technologies such as digital text, electronic books, simulations, text messaging, wikis, blogs, and webinars that are designed for interactive learning through multiple channels of delivery within and beyond the classroom (Bonk, 2004; Delialioglu & Yildirim, 2007; Khine & Atputhasamy, 2003). An additional outstanding feature of the e-learning paradigm is the use of networking technologies for organizing effective digital content for studying subject materials, and allowing students to access resources in class, at home, anywhere, or anytime. Consequently, the embedded digital learning materials, supplemented with interactive multimedia tutorials, enhance learners’ motivation and engagement.

Specifically, the digital curriculum with its multi-media and interactive content has the advantage of allowing students access to a variety of learning tools and resources to support homework assignments, learning tasks, independent or group projects, multi-level tutorials support, Internet and Intranet collaborative activities, and a variety of electronic communication experiences through E-Board discussions, and similar Media technologies such as Webinar and Podcast (Pacuilla, Ruedel & Mistrett, 2004; Ghirardini, 2011). Other advantages include paperless convenience, cost-reduction, and flexibility in course delivery in terms of time and location, and increasing learning experiences for a larger population of learners.
2.4 The Emergence of Blended Learning in High Schools

The e-learning culture in the form of online learning has come to play a prominent role in higher education since the 1990s. However, the advent of e-learning does not mean that the students of the future will learn through online media alone. Rather, the optimum solution seems to lie in finding appropriate ways of combining e-learning with face-to-face learning environments. Blended learning, in particular, is now emerging as the prominent model in transforming the way education is delivered in universities (Watson, 2008; Graham, Woodfield, & Harrison, 2013).

Following this trend at a different level within the educational system, many American high schools have also been developing online programs offering courses and academic credits that help students towards fulfillment of a high school diploma in the past ten years. A substantial number of research studies has shed light on how the infusion of e-teaching within blended programs has transformed pedagogy and learning in every aspect of education from K-12 to higher education. A recent meta-analysis of 45 studies carried out in high school, university and adult education (Means, Toyama, Murphy, & Baki, 2013) suggests that the results of blended learning programs are consistently better than the results of face-to-face learning on its own. Nevertheless, recent empirical studies continued to assert that blended learning requires more evidence-based studies in order to design better support for teachers who have either little experience or limited knowledge of e-learning and blended learning practices.

It has often been stated that there is no consensus on the definition and description of blended learning characteristics that can serve as an orientation compass for teachers to go by when they embark on creating a blended learning course in their teaching (Graham, 2006, 2013;
The usual definition of blended learning is underpinned by the notion that the convergence of two collaborative delivery styles provide students with the benefits of both face-to-face and online experiences (Hijazi, Crowley, Smith, & Shaffer, 2006). If we understand that electronic learning is defined as use of any digital device, such as a computer or mobile device, for the purpose of instructional delivery intended to support learning (see previous section), then blended learning is a form of learning which combines this with other, usually face-to-face, teaching methodologies. Driscoll (2002) defined blended learning as “to combine any form of instructional technology (e.g., videotape, CD-ROM, Web-based training, film) with face-to-face instructor-led training”. Singh (2003) elaborated on Driscoll’s definition and described how blended learning models combine various delivery modes such as face-to-face, online, and offline (2003, pp. 61-64). In the opinion of Reid (2006), blended learning, with the capability of mixing the synchronous online components with the asynchronous self-paced study, is beneficial to students of various learning styles. In the opinion of Ward (2004), the advantages of incorporating online learning into the “traditional curriculum” include possibilities offered by web pages, digital libraries with access to a wide selection of databases, online tutorials, and use “facilitation techniques” during online discussions to support higher levels of critical thinking (Lim, Cheung, & Hew, 2011). Alongside this view, Watson (2008) expressed the idea that the combination of online and face-to-face education is emerging as the predominant instructional model for all educational institutes.

From a different perspective, Staker & Horn (2012) described blended learning as a flexible program model in terms of educational settings, time-scales and availability:
A formal education program in which a student learns at least in part through online delivery of content and instruction with some element of student control over time, place, path and/or pace and at least in part at a supervised brick-and-mortar location away from home (p. 3).

All of these definitions arrive at the same conclusion. Blended learning is the incorporation of face-to-face instruction with computer-mediated instruction to facilitate interactive and reflective higher-order learning. The new blended learning model continues to increase in popularity within school communities in view of its contribution to student learning. However, within the blended learning paradigm, various models exist, which will be explored below. Before that, however, it is important to take a look at the different learning perceptions, which influence the design of blended learning programs.

Many educators and researchers assume that the combined features of both online and face-to-face learning environments create the best learning situations, because students benefit from the convenience of the online format, but also have enough personal time with teachers (Staker, 2011). At the instructional level, the adoption of blended learning helps teachers to use “a variety of instructional technologies with available Information Communication Technology (ICT) to achieve effective learning outcome” (Port, Graham, Spring, & Welch, 2014, p. 397). At the course delivery level, the blended learning course design offers teachers a new approach to teaching and course delivery. The blended learning environment not only influences but also enriches teaching quality (Poon, 2013). It seems that the majority of students enjoy blended learning because they treasure the freedom of having alternative ways of expressing themselves,
such as the opportunity to use self-regulated time to write during independent study sessions, and the occasion to verbally interact with peers and instructors in the face-to-face classroom (Garrison & Kanuka, 2004). From the perspective of knowledge acquisition, the variety of e-learning resources enables students to make connections between present and background knowledge and prior experiences (Vaughan, 2010; Forsman, 2010), and stimulate their interest and motivation to further pursue particular themes of study (O’Toole & Absalom, 2003). It is noted that blended learning opportunities increase the possibilities for students to interact with course content, as well as introducing additional ways of interacting with teachers and peers and classmates (Johnson, 2013). Moreover, the blended learning experiences train students to become more active learners by demanding them to constantly re-evaluate the new teaching-learning situations to maximize learning (Poon, 2013). In addition to this, the e-learning environment helps students to acquire much-needed computer skills that equip them for the workplace. Innovative technologies used for educational purposes are growing fast and being invented at an exponential rate, and blended learning gives teachers the opportunity to use them strategically as part of a well-designed educational program. “The pace of technological change, whether through advances in information technology, bio-technology, or such emerging fields as nanotechnology, will almost accelerate in the next ten to fifteen years” (Karoly & Panis, 2004, p. 2). These developments mean that e-learning, and within that, blended learning, offers a unique opportunity to bring education up-to-date in a meaningful way, so that our students can meet the challenges of the 21st century workplace with greater confidence and better preparation. In the words of Burkhardt et al. (2003), “School must embrace new designs for learning based on emerging research about how people learn, effective uses of technology, and 21st century skills in
the context of rigorous academic content” (p. 2). Blended learning provides an excellent opportunity to put this idea into practice.

2.5 Learning Theories to Guide Blended Learning Designs

Several learning theories are worthwhile reviewing because they serve as background for understanding contemporary instructional designs being practiced in American classrooms, and therefore, for understanding the role of blended programs. As Carman (2005) pointed out, blended learning is here to stay, so the main question facing us is what additional ingredients should be added to the blended learning mix, and how the balanced should be established between blended and face-to-face learning. Carman (2005) therefore, recommends that understanding the popular learning theories of cognitivism (Gagne, Clark, Merrill, & Bloom), and constructivism (Piaget, Vygotsky) will support teachers in gaining a better knowledge to construct the right mix in the blended learning situation. As such, learning theories are useful guiding principles behind most instructional practices in blended learning situations (Carman, 2005, p. 2, 8). In this research project, the teachers were interested in pedagogical philosophies that are aligned with Metro Academy’s school culture, which advocates a constructive, student-centered learning environment (Section 1.2). For this reason, the following learning theories are part of the agenda items in this literature review.

2.5.1 Socratic Concept of Learning

The Socratic Seminar or Socratic Circle instructional practice is a common learning strategy in the blended learning classrooms. The Socratic method, in the form of inquiry and discussion, enables students to think for themselves, start an inquiry process of divergent
thinking, and engage in discussion at a higher level of interest and involvement (Koelliner-Clark, Stallings, & Hoover, 2002; Bunyl, 2010). Using hybrid technology to separate a regular-size class into two discussion groups, one smaller group in the inner circle (the face-to-face) class, and the bigger group in the outer circle (the online) class, can generate greater opportunities for students to interact with each other. The teachers can role model the real-time discussions in the face-to-face class while students dialogue on their own through e-thread discussions on the e-discussion board. This hybrid learning strategy stimulates cooperation and collaboration, as well as increasing social communications among participants in the learning process (Wiggs, 2011).

Moreover, the blended learning enhanced Socratic seminar stimulates greater interest in students to learn, helps to maximize participation, and gives opportunities to students to self-practice this learning strategy. Many English and Social Studies teachers are inclined to employ the Socratic dialogue as an effective questioning strategy for guiding and eliciting their students to discover new knowledge in a discussion. Since this method requires students to have a good foundation of domain knowledge in order to participate, the online portion of the blended learning environment, which students can access anytime and anywhere, becomes an occasion for students to acquire domain knowledge in advance to prepare for the in-class activities.

Socratic discourse is an effective learning strategy because the teacher poses questions that require students to evaluate each other’s replies, and thus leads students to sustain a continuous discussion (Tredway, 1950). The Socratic Methodology is a valuable domain for teachers to probe into for a deeper understanding of students’ affective motivation in the learning process, and one that can be effectively exploited via blended learning platforms.
One of the problems teachers encounter in the classroom is that students are not motivated to learn because the subject matters are too abstract, or they think the contents in the textbook do not relate to their real life and therefore are not useful for their immediate needs. The same students may claim that the main purpose of going to school is to have a well-paid job in the future or to achieve prestige. At the same time, some students may think differently and will seek a bigger, deeper, or more meaningful purpose to study that goes beyond immediate concerns. For instance, some students believe that theme-driven or long-term goals play an important part in arousing their interest in learning (Bernasconi, 2010, Hidi, 1990). These students have the ability to maintain and sustain a higher quality of motivation for study. In both cases, the teachers’ role in the Socratic seminar is to pose open-ended questions to activate the students’ prior knowledge, direct the flow of the discussion, develop the students’ ability to lead, and transform passive students to authentic, active learners (Bieg, Backes & Mittag, 2011; Skinner & Belmont; Pintrich, 1999). The various learning opportunities of blended learning (synchronous asynchronous discussions, chats, forums) provide an ideal platform for teachers to exercise this instructional strategy.

2.5.2 Piaget’s Cognitive Development Theory

Piaget’s theory of intelligence and affectivity with regards to children’s different stages of cognitive development offers a deep insight into their knowledge acquisition process as they grow from being a child to becoming an adolescent (Murphy, 2000). The third stage of cognitive development is of particular interest to the high school teachers. Piaget suggested that children at this stage are able to distinguish between the goals from the means as a tool to reach the goals, “the flexible coordination of means in order to achieve a goal that has been previously
determined” (Piaget, 1989, p. 2). This implies that a child is able to make an intelligent choice, such as spending more time for studying for an examination instead of choosing to play a video game. In other words, children begin thinking logically and are able to infer consequences from concrete incidences. “Complex behaviors appear on the cognitive plane and new forms of feeling show up on the affective” (1989, p. 4). Continuing on this point, Piaget explained that, “Even more characteristic of this stage, is the appearance of a value system, which is not just a matter of the economy of action, but has to do with its finality. This value system determines the energies employed in action” (Piaget, 1989, p. 42). Piaget’s theory of cognitive development in adolescents implies that during this stage youth begin to think about the difference between right and wrong, and develop the ability to make decisions and appropriate judgments. Therefore, teachers are important role models for students’ ethical and moral character development during these adolescent years (Lumpkin, 2008) and help them gain competence in acting ethically in a democratic life (Alt & Reingold, 2012). Touching on the theme of affective motivation, Piaget believes that knowledge is created through experiences; therefore, motivated learners are more likely eager to engage in the process of cognitive constructivism – building new meanings from past and current learning experiences. Piaget’s theory adds insight to understanding how teachers can increase students’ enthusiasm to learn through the right mix of blended strategies.

In summary, Piaget’s learning theory of social constructivism offers teachers guidance for designing the blended learning curriculum with effective instructional strategies at the appropriate time and place. Teachers can effectively use instructional scaffolding techniques to explain complex and abstract ideas, from simple and concrete to abstract or complex situations.
(Piaget, 1962). By taking advantage of the hyperlinks and web resources organized and planned by the teachers, students can connect to various resources for scaffolding and constructing new knowledge at different phases of the learning process, such as having students prepare in advance with pre-assigned online activities before attending the class. In addition, teachers can introduce e-vocabulary games, manipulatives, graphic organizers, and technology software to give opportunities for students to re-construct new knowledge outside and during class time. Some of the technology tools are listed here:

- 1. Digital tools allow students to hear pronunciations; read words in a variety of authentic examples, view photos and images related to words, reinforce word learning through interactive games, play with and manipulate language; discover rhyming words; and collaborate with classmates to create virtual words well (Tyson, 2015).

- 2. The ‘Geometer Sketch Software,’ which has capabilities to design and re-design geometrical figures like rectangles, triangles, squares, and circles, is useful to reinforce learning in mathematics.

- 3. The T1-Nspire CX graphic calculator app in Excel or Doc format, which is transferable to the iPad screen to be reviewed outside of the classroom during students’ own time, offers effective online activities (Horton, Storm, & Leonard, 2004).

2.5.3 Gardner’s Theory of Multiple Intelligences

Blended learning creates new opportunities for teachers to design and create an educational learning model around individuals’ needs in accordance with different learning styles. As described by Silver et al. (1997), “multiple intelligences theory is the fruit of cognitive science and reflects an effort to rethink the theory of measurable
intelligence embodied in intelligence testing” (Par 1). From a different perspective from Piaget, but still talking about the different abilities of the human intelligence, Gardner’s analysis of the human mind consists of different patterns of intelligences, at least a minimum of eight different forms of intelligence. In his later work, Gardner added a ninth, ‘existential intelligence’, which shows a person’s proclivity to ponder questions about life, death, and ultimate realities.

Each intelligence reflects the potential to solve problems or to fashion products that are valued in one or more cultural settings. Intelligences are identified by a set of criteria: These include representation of specific part of the brain; susceptibility to encoding in a symbolic system; and the existence of special populations, such as prodigies and savants, that often exhibit intelligences in splendid isolation (Gardner, 2006, p. 71).

Gardner’s learning theory enlightens educators in the concept of differentiated instruction in a multi-cultural classroom. Knowing how students perform differently with different learning tasks, and what procedures they use to process the information more effectively, teachers learn how to tap into students’ ability to do different levels of class activities and assignments in both the online and face-to-face class settings. Blended learning is all about the multiple possibilities of not only creating differentiated learning situations, but also giving flexible time for students to study and work on activities in their own time. For example, some students are good at working with theories and abstraction; some learn better with facts and observable phenomena; others learn faster with visual
presentations, facial expressions, body languages, and non-verbal promptings. Using the appropriate blending strategies, teachers can design activities and assignments that are suitable to each student’s level and needs. As Gardner explained:

Students encounter materials in ways that allow them access to their content, and have the opportunity to show what they have learned, in ways that are comfortable for them yet also interpretable by the surrounding society (Gardner, 2006, p. 73).

In short, Gardner (2011) advocates that the teacher supports students’ cognitive development according to students’ academic data, abilities, and learning styles. Blended learning methodology enhances applications of differentiated instruction because it allows every student to work on the particular task according to his or her abilities, learning styles, and in the order he or she chooses. The blended learning course work creates a pathway to differentiated and personalized instruction in a blended literacy classroom where students do not necessarily have the same reading comprehension level. Some students would like to become familiar with the online reading activity first and then listen to the teacher’s class instruction, or prefer to seek online tutors for further understanding of the literacy content after class. In the blended classroom, students have the opportunities to work alone, in pairs, or join a discussion group. While working online, students have access to various assistive technologies and peripherals, such as cameras, scanners, microphones, and speakers, and voice-to-text software to support their learning. As Woodall (2012) described, students’ education is extended beyond the
classroom because they do not have to be at the classroom location to benefit from the instruction. In most technology supported classrooms, blended learning is considered by most educators as an effective instructional methodology and strategy to combine different learning environments in one classroom, allowing the student to learn in a way which best suits him or her (Woodall, 2012).

2.5.4 Vygotsky’s Social-constructivist Theories

The theories of Piaget, Gardner, and Vygotsky are similar in the sense that they are interested in seeking understanding of the development of human potential, that is, how to realize a learner’s cognitive potential to a higher level through education. For example, Vygotsky spoke of maximizing the students’ capacity to learn by the principle of the Zone of Proximal Development, the point where students can best assimilate knowledge. If we take the Zone of Proximal Development seriously, we see that it is important for teachers to know what to teach, how to use instructional strategies, and how to choose the right moment for promoting students’ intellectual activities (Lui, 2012). The main distinction of Vygotsky’s theory from Piaget and Gardner was the great emphasis on a person’s cultural setting and upbringing as the important determinant for the student’s cognitive growth, and his understanding of the role of teachers and peers in supporting learning. In Beliavsky’s opinion, Vygotsky ideas can be viewed through the lenses of Gardener’s theory of Multiple Intelligences: “Vygotsky’s dream of maximizing the Zone of Proximal Development can be realized by utilizing Gardner’s approach of nurturing the students’ combination of intelligences” (Beliavsky, 2006, abstract). Vygotsky’s theory has a definite imprint on the contemporary approach of designing the blended learning environment.
The purpose of designing the blended learning models is the attempt to maximize the effectiveness of the learning environment related to students’ intellectual development and growth from different points of view such as students’ cultural experiences, learning styles, and personal characteristics and traits, which may contribute to promote student learning. The opportunity available in some blended learning programs for students to work on material at different levels, for example, allows for adaptation to students’ previous knowledge or skills, and enables them to work more effectively within their zone of proximal development.

2.6 Instructional Strategies and Learning Skills

The blended learning environments with many virtual and real time learning opportunities offer teachers the chance to apply different instructional strategies, which are intended to operationalize the learning theories described above in different ways. Gagne (1977) classifies five major types of learning, namely verbal, intellectual skills, cognitive strategies, motor skills, and attitudes. Each type of learning requires different formats and types of instruction strategies. This author stipulated that learning will happen when learners are given the opportunities to practice in a problem-solving situation, to acquire an attitude through discussion or engage in an argument, and to experience a role-playing activity.

In another view, Merrill (2002) described learning as consisting of several domains: demonstration, activation, integration, and application where each domain plays a specific role in the problem-solving process. In each of Merrill’s domains, the instruction involves teachers using scaffolding strategies to develop the students’ higher order of cognitive or problem solving skills,
and offers students just enough support at the beginning, during, and at the end of the lesson so there is room for them to self-direct their learning when they are working independently (Vygotsky, 1978; Gredler, 2009, 2012).

In any account of the design of learning materials, some attention must obviously be devoted to Bloom’s taxonomy (1956) and its updated versions (Krathwohl, 2002). These taxonomies reflect the different learning objectives that teachers set for students in three different domains: cognitive, affective, and psychomotor. Bloom’s Taxonomy of thinking skills and learning strategies can be applied in every subject class to support student engagement in the higher order of cognitive activities. It provides a way of talking about learning goals that facilitates communication between participants and stakeholders, as well as a way of generalizing about broad educational goals that cut across many disciplinary areas. The original taxonomy presents a hierarchy of categories going from knowledge (the most basic level) to evaluation and judgment (the highest level). More recent versions (Krathwohl, 2002) show how these categories also function in various dimensions, which make it possible to distinguish between factual knowledge, conceptual knowledge, procedural knowledge and metacognitive knowledge. Such taxonomies provide an essential framework which underlies most of the secondary school curriculum in the United States and elsewhere, and within the literacy program, they are used to define learning goals and achievement benchmark for each grade level reading within the literacy program.
2.7 Organizational Models for Blended Learning

There is a certain consensus that as blended learning education gains momentum across the country, it is no longer taken as an option but rather as the best means for improving the quality of teaching and learning in the classrooms (Bedford, 2013). In the past few years, six patterns of blended learning have emerged in the United States. Most schools do not use these models rigidly but rather use them as points of departure to design their tailor-made models to fit their needs.

Staker (2011) identified six profiles of emerging blended learning models:

1. The ‘face-to-face’ driven model, in which a teacher in a traditional classroom instructional setting employs online learning for remediation or supplemental instruction;
2. The ‘rotation model’ in which students move back and forth between online and classroom instruction;
3. The ‘Flex’ model in which the curriculum is delivered primarily through an online platform, with teachers providing on-site support;
4. The ‘online lab’ approach, wherein the online course is delivered in the physical classroom or computer lab;
5. The ‘Self-blend’ is a model in which students choose on their own which courses they will take online to supplement their schools’ offerings;
6. The ‘online driver’ model, where the courses are primarily online and physical facilities are used only for extracurricular activities, required check-ins, or similar functions (Staker, 2011, pp. 7-8).

Blended learning models give teachers options of at least four varieties of teaching and learning situations:

1. Rotation learning in which students can rotate to the computer lab or to other online resources in the same room.
2. Flexible learning in which students move around different modalities at self-paced or under the supervision of the teacher or teacher assistant.

3. Hybrid learning which allows students online time and part-time spending in class.

4. Flipped classroom where teacher combines in-person and virtual learning to meet individual needs. Students have the opportunity to review recorded video or podcast before class or in-class (Staker, 2011, p. 9).

These models suggest that multiple blended learning environments are possible for teachers to mix various learning technologies and resources by using different delivery methods to enhance learning. Based on these recommended models, teachers may determine or design their own combination of ‘mix’ that works for them and for their classes. Caravias (2014, p. 61) perceived that, “Blended learning is seen as a link between teachers, students and classrooms located in different places to enhance learning.” The blended learning models described above create conditions that facilitate the transition of a teaching-centered to a student-centered instruction in the classroom. It is conceived that the blended learning environment facilitates not only the effective organization of course materials, but also the application of best pedagogical practices such as technology-enhanced flipped instructions, web-based resources, online quizzes, activities, discovery labs, individual projects, and group activities to increase students’ learning opportunities within the e-learning context, blended classroom (Teo, Chang, & Leng, 2006).

2.8 Pedagogical Factors in Blended Learning Designs

Building a model for blended learning literacy instruction requires thoughtful decisions about selecting the appropriate instructional-design in which teachers can apply a set of
strategies to achieve learning objectives and outcomes within the online and face-to-face platforms (Wiggin & McTighe, 1998, 2005). Design models are very often linked to certain instructional paradigms. The instructional paradigm that Reigeluth (1999) described is a model that builds on the learning concept of constructivism. Two outstanding representatives of the constructivism theory are Piaget’s cognitive learning and the revised version of Bloom’s theory of analytic thinking skills (see above). Advocates of the constructivism theory claim that students scaffold and construct new knowledge based on their own understanding of the content materials. Therefore, the “learning environment must be designed to support investigation, insight, reflection, and discovery” with an inquiry-based learning approach (Abdelraheem & Asan, 2006, p. 68). Teachers will need to use instructions to help learners develop the capabilities of using different technology tools for developing their cognitive abilities in each of the blended learning components: face-to-face and online. For Perkins (1992), the instructional learning portal must allow students to follow clear directions during the entire learning process.

Therefore, it is suggested that teachers should keep these four features in mind when designing the blended learning model:

1. Clear information: Descriptions and examples of the goals, knowledge needed, and the performances expected are clearly defined.

2. Thoughtful practice: Opportunity for learners to engage actively and reflectively in whatever is to be learned such as performing numerical operations, solving word problems, or writing essays.

3. Informative feedback: Clear, thorough counsel to learners about their performance, helping them to proceed more effectively to the next step of learning.
4. Strong intrinsic or extrinsic motivation: Activities that are amply rewarded, either because they are very interesting and engaging in themselves or because they feed into other achievements that concern the learner.

On the topic of curriculum planning and instructional delivery, Garrison & Vaughan (2008, 2012) emphasized that blended learning changes the teachers’ approach to designing and delivering their lessons, which represents a new approach to teaching and the redesigning of the educational environment. Different instructional designs introduce students to various learning experiences, and each one produces its distinct learning climate. Instructional designs can be of the teacher-structured approach or a self-regulating approach. The face-to-face component tends to represent a focus-approach on directed instructions, clear performance standards and objective goals, and with an emphasis on developing the cognitive skills through the teacher’s guided practice. The online instruction emphasizes more on the self-regulated approaches in support of independent practices, self-monitoring, and self-evaluation in which students manage their own behaviors, emotions, and cognitive processes in their learning experiences (Reigeluth, 1992, 1999; Tennyson, 2010; Zumbrunn, Tadlock & Roberts, 2011, p. 4).

Reigeluth further defined the instructional design theory as consisting of both methods and situations for learning. The method consists of chunking information into smaller parts and using scaffolding techniques to lead students step by step to higher order thinking. The situations for learning are classified as instructional conditions and desired outcomes. With respect to the organization of the class lecture, Reigeluth (1999) made reference to Perkin’s (1992) core ideas of instruction and explained that good teaching implies that teachers use different methods for
different occasions to address various learning styles. In terms of class instruction, which is a part of instructional design, Leinhardt (1989) emphasized that there are three important aspects to consider: A rich agenda for class instruction, flexible and consistent lesson structure, and clear objectives and goals indicated for learners to follow. While this document was written from an institutional perspective as a technology plan for the University, the report written by Bath & Bourke (2010) for Griffith Institute for Higher Education, “Getting Started with Blended Learning”, was conceived from the perspectives of instruction and learning. In addressing the learning environment of a specific blended learning course or project, Díaz & Entonado (2009) recommended four categories as objects of study: design, content, interaction, and activity-scenarios. Similarly, Brown & Voltz (2005) described additional elements such as context, delivery, feedback, and influence as important features for serious consideration in designing an effective blended learning program. One may conclude from the above readings that both technology planning and the practical aspects of instruction within the technology infrastructure must be well integrated for instruction and learning to take place smoothly and successfully. Above all, Ghirardini (2011) articulates the importance of creating a design model with an interactive content thinking of and based on the needs of participants.

Hogan (2013) described the digital curriculum as any digital media that teachers use for instruction purposes and students use as a learning tool. The online digital curriculum as a key component of the e-learning teaching and learning platform is perhaps one of the most effective educational tools for empowering teaching and promoting in-depth and meaningful learning experiences (Dede, 2014), as well as having the potential to support students of different learning styles. Using the digital platform, “learning becomes constant” (Yapici & Akbayin, 2012),
so students can study and obtain needed information not only in the classroom settings, but also from their homes and during weekends or holidays.

In keeping up with the digital trend, most of today’s subject textbooks published for the blended learning classrooms in the United States are designed to include the online digital curriculum accessible for students’ usages on both online and offline platforms. The student-centered learning paradigm promoted by Biggs & Tang (2011) has become the new instructional direction for designing online digital textbooks in the past ten years. This new paradigm represents the educational shifts of instruction and learning at three levels: Mission and purposes, criteria for success, and teaching and learning structures (Biggs & Tang, 2011). The primary drive of this learning paradigm is to produce efficient learning outcomes. Effective teaching implies that teachers “encourage students to use the learning activities most likely to achieve the outcomes intended” (p. 16). Teachers must acquire knowledge of how students learn, and use the appropriate learning activities according to each student’s cognitive level. The authors distinguished the surface approach from the deeper approach. The surface approach is when teachers assign “learning activities that are of lower cognitive level” for students to achieve the intended outcomes (p. 16). On the other, the deeper level approach is one where teachers use “high level learning activities appropriate to achieving the intended outcomes” (Biggs & Tang, 2011, p. 16). In other words, the learning process should be understood not as “what the teaching is doing, but rather on what the student does and how that relates to teaching” (Biggs & Tang, 2007, p. 17).

The student-centered approach can be summarized in these two main ideas:
Teaching is not just about facts, concepts and principles to be covered and understood, but also to be clear about: 1. What it means to understand content in the way that is stipulated in the intended learning outcomes. 2. What kind of teaching and learning activities are required to achieve those stipulated levels of understanding? (Biggs & Tang, 2007, p. 19).

In the new education paradigm, instructors acquire a new role in the instructional process, thereby changing the way in which a student learns. The new blended paradigm creates a much richer environment for instruction and learning. By having a range of technologies available at their disposal, teachers are presented with different modalities for instruction delivery and assessment methods to customize individualized assignments. Furthermore, teachers also have the option of creating an environment of one-on-one or group learning situations and activities, such as the Station-Rotation blended learning model where students might rotate between one-on-one individualized coaching and small-group learning with the instructor (Hudson, 2013). These possibilities are less feasible in the traditional classroom settings where instructors are accustomed to transmit knowledge in the format of a formal lecture. In contrast to the student-centered learning environment, Huba & Freed (2000) summarized the teacher-centered paradigm of the traditional classroom as a passive process in which knowledge is transmitted from professors to students where students passively receive information. On the other hand, the new learner-centered paradigm allows students to construct their own understanding of the instructional materials through the process of gathering, synthesizing, and integrating information using the general skills of inquiry, communication,
critical thinking, problem solving and so on. Traditionally, most of the time students would listen and take notes passively during class lectures. Teachers post questions from time to time, and pause or wait for students to volunteer their responses. In a teacher-centered learning environment, instruction and learning are basically structured by the instructor’s prepared lectures that are confined within each subject’s particular discipline. The student-centered paradigm can be described as flexible learning and allows room for autonomy and choice. For both teaching and learning, blended learning instruction through using various modalities of teaching possibilities have the potential of inspiring students to develop a new sense of ownership in knowledge mastery. Students are required to listen actively during class lectures and instruction in order to participate meaningfully in the online assignments, and vice versa must also know how to integrate knowledge from the online activities into class work and engage in real-time class discussions.

On the topic of curriculum planning and instructional delivery, Garrison & Vaughan (2008) emphasized that blended learning changes the teachers’ approach to the way lessons are planned and delivered. Huba & Freed (2000) accentuated that the new learning paradigm not only inspires a new approach to learning, but also a new trend in curriculum and textbook design. This new educational trend can be characterized as a shift from a competitive and individualistic approach to the more cooperative, collaborative, and supportive approach to learning for both educators and learners. The current curriculum design in most high school textbooks reflects this new approach of curriculum organization to include online activities and projects that facilitate students’ development of Bloom’s analytic skills.
In an effort to provide students with opportunities for scaffolding learning tasks and to enliven communication between teachers and students, Carman (2005) proposes that blended learning curriculum designs contain these features:

- **Live Events:** Synchronous, instructor-led learning events in which all learners participate at the same time, such as in a live “virtual classroom.”

- **Self-Directed Online Content:** Learning experiences that the learner completes individually, at his own speed and on his own time, such as interactive, Internet-based or CD-ROM training.

- **Collaboration Opportunities:** Environments in which learners communicate with each other through e-mail, threaded discussions and online chats.

- **Rich Reference Materials:** On-the-job reference materials that enhance learning retention and transfer, including PDA and PDF download (2005, p. 2).

In summary, the blended learning concept is organized around a flexible instructional environment where teachers can present instructional content through a variety of modalities and media to stimulate interest and active participation. Blended learning requires thoughtful planning on the part of the instructor in order for students to achieve their best learning outcomes. When the blended learning components are well-organized and conceived, learners are able to maximize learning opportunities, engage in collaborative work with class peers, and have the opportunities to receive both personalized guidance from teachers, as well as mentoring supports from a knowledgeable tutor or an expert outside of the class time. In other words, the shift from a teacher-centered and teacher-directed learning environment to a
student-centered and student-directed learning environment is a change that reflects a paradigm shift of students passively receiving knowledge to that of students actively engaging in the learning process. In contrast, when blended learning modalities are poorly mixed without pre-planning of the various factors related to effective learning, learners could experience frustration or feel disoriented in the learning process (Green, 2013). For this reason, Biggs & Tang (2007) emphasized that teacher education in the form of professional development and training plays a crucial role for supporting teachers to make the shift from one paradigm to another, thus making it possible for students to achieve the expected outcomes. Effective teacher education also serves to increase teachers’ willingness to engage in technology initiatives, and to support effective integration of technology into the teaching and learning process.

2.9 Key Beneficial Features of Blended Learning

2.9.1 Flexible Pedagogy and Learning

The rich resources of advance e-learning tools such as digital textbooks, digital library, multimedia’s colorful illustrations, and web-based lessons are most suitable for visual and audio learning in a literacy or any content subject class (Alasraj & Alharbi, 2014). These are powerful tools for providing students with alternative opportunities to study independently or collaboratively with peers at home or in the online lab (Matukhin et al., 2014). Most students appreciate the blended learning environment because it allows them extended time for studying beyond the class sessions (Akkoynulu & Soylu, 2008). Furthermore, learners enjoy the flexibility and freedom of being able to choose the kind of learning environment they prefer such as face-to-face, online, or hybrid (Boyle, Bradley, Chalk, Jones, & Pickard, 2003; Shroff & Vogel, 2010). In
the traditional classroom, learning is limited to what the teacher teaches within the face-to-face environment. In the blended classroom, the use of the online digital curriculum facilitates learners’ diverse literacy skills development such as reading, writing, and comprehension because they can go back and forth to the online lessons anytime and anywhere for further review and understanding with their own flexible schedule. Furthermore, the e-library allows instructors and students to choose from the web’s unbounded resources of reading materials that “reflect the authentic purposes for which people do read. This will help them realize that reading is not just a linguistic exercise but is involved with the getting meaning out of a text for some purpose” (Nuttall, 1982, p. 2).

From the instruction angle, the rotational model concept offers teachers the possibility of increasing or decreasing the online and face-to-face instruction within each session. This flexibility allows teachers to regulate their teaching schedule in order to increase students’ learning opportunities or to admit more students into the program (Christensen, 2003, pp. 235-243; Cottrell & Robinson, 2003). Teachers can use different instructional methodologies and strategies to create a personalized learning environment within the online and face-to-face classes (Staker & Horn, 2012; Usmeldi, 2014, pp. 35-36). By applying “flipped” techniques between face-to-face instruction and online resources, teachers are able to create an interactive learning environment supportive of teaching and enticing to learning. Teachers can take advantage of class time towards developing students’ analyzing and evaluating skills by having individuals explore the basic information of the lesson ahead of class time (McCue, 2014). The hybrid mix also gives new options for teachers to create smaller groups of learning communities by balancing instruction and activities between face-to-face and online. The blended learning
environment is flexible and convenient once users become proficient with the blended curriculum; it could also be very simple for teachers to create an interactive learning environment. For example, Kristin (2014) described that she uses only one iPad to create different paths of interactive and collaborative learning situations for all students. The following case study is an example of how teachers can design a flexible learning environment to achieve the desirable blended learning coursework.

In Martyn’s (2003) case study, the blended design consists of a four-hour ‘Orientation’ class on the first day of classes, and the ‘Concluding’ class for the final examination and course evaluation. The first class allows the teacher to explain the course portal content, the use of interactive learning tools, “instructional links to other resources on the Internet, online assessments, and computer-mediated communication tools” (Martyn, 2003, p. 19). The last class provides an opportunity for the course closure. Students meet with the instructor to discuss issues or resolve problems. Teachers may use this time to give feedback and return projects or exams that could not be done electronically during the term. In these words, Martyn described how the ‘Orientation’ and ‘Last’ classes add to the course program “a quality education with a personal touch” (Martyn, 2003, p. 20). This study claims a high level of student satisfaction, and a course completion rate near 100 percent. It’s worthwhile to note that this research conducted in 2003 represents one of those initial experimental attempts of blended learning.

**2.9.2 Motivation and Engagement in the Blended Classroom**

One key element related to students’ effective participation in the learning process is intrinsic motivation. Intrinsic motivation is an internal desire that moves the learner to work towards a goal; it is an important cognitive function necessary for a person to persevere and to
acquire a quality learning experience (William, 2011). By contrast, “Lack of motivation and low student satisfaction had been frequently the factor cited relating to high dropout rate in online education” (Ellis, Steed, & Applebee, 2006, p. 18). As it is pointed out, motivation in one way or another is the function of the instructors’ instructional quality, learners’ subject interest, and the learning environment (Lim & Morris, 2009). Teachers not only educate the students with knowledge, but also influence students’ desire to learn, and therefore, develop the capacity for more knowledge (Taylor & Parsons, 2011). A point to take note of is that technology is a tool in the hands of those who use it, just as paints are in the hands of a painter. Ultimately, teachers are always the greatest contributors to students’ motivation to learn and to perform with success for many reasons. In the blended classroom, the teacher determines the appropriate Internet resources or technology products that are usable to differentiate instruction, and for structuring learning environments to address the variety of abilities, learning styles, and personal interests exhibited by the students. With skillful planning, teachers organize various computer stations in the classroom computer laboratory with different levels and types of educational materials in such a way that tasks and activities are matched according to the needs of each student. Differentiated instruction is an instructional technique that works effectively if the teacher knows each learner in-depth. Teachers are in the position to know well the strength and weakness of each student, and therefore are able to develop different lesson options and the appropriate levels of challenge to motivate all students so that everyone is attaining the theories, concepts, ideas, performance tasks, and skills that are taught in each lesson. The strength of the theory of differentiated instruction, which is based on the concept that all students can learn, can be traced back to the work of Gardner (2011, see Section 2.5.3). The blended approach allows
teachers to integrate the more interactive e-learning strategies to supplement the lecture-driven instruction that is common in the traditional classroom. In a blended learning environment, teachers may introduce multi-media technologies into both the online and classroom-based instruction to stimulate and develop students’ interest and enhance their learning experience. By infusing the appropriate technologies into different learning activities, content teachers have additional ways of cultivating students’ interest toward the themes of the lesson (Caravias, 2014).

In practical terms, instructional technology-rich presentations are highly empowered through engaging images, high-resolution colors, and powerful real world connections leaving a lasting impression in the learners’ mind. For instance, teachers can use power point slides or the interactive Whiteboard to interact with digital content materials to demonstrate the main concepts of the class lesson, while students can access additional resources online to reinforce their understanding of the main concepts represented in the lesson during or outside of class time.

Many research studies have been devoted to the study of the usefulness of Whiteboard technologies in the blended classroom. The interactive and three-dimensional nature multi-media technologies of whiteboards make possible an educational experience that’s more motivating, enriching, and interesting (Morgan, 2008). Whiteboard interactive technologies may include, but are not be limited to the following: Manipulating text and images, taking notes from digital links, saving notes for later review by using e-mail, viewing websites as a group, demonstrating in front of the class without being tied to a computer, creating digital lesson activities with templates, writing notes over video clips, using presentation tools on the whiteboard to enhance learning materials, and showcasing student presentations. As the result,
students are more motivated and remained focused on the teaching lesson. In speaking of English Language Learners, DelliCarpini (2012) commented that when teachers integrate technology effectively into the curriculum, English learners are motivated to read and go deeper into the content materials (Curthrie & Humenick, 2004).

As Appleton, Christenson, & Furlong (2008) described, “Motivation is central to understanding engagement” (p. 379). Whether the engagement is in an academic subject, in performing a task, or working individually or in a group, students need to be motivated in order to be engaged in an activity fruitfully. The blended learning classroom can make learning more fun and interesting and the comprehension of content texts easier for students with various comprehension levels at different grades (Kaplanis, 2013). The combination of a variety of innovative learning techniques in the e-learning environment such as video, audio, and multimedia presentations complement the traditional classroom-based instruction. Especially for the ESL students, the rich contexts made up of visual and auditory information in the e-learning component of the blended learning instruction have the advantage of making students more engaged and immersed into the learning environment (Meskill & Mossop, 1997). When learners are motivated, they become more attentive and focused on what they are learning, and naturally show improved participation and engagement in the lesson.

The blended learning environment with its greater capacity for new technology practices empowers students to engage in active learning, and study at their own time and comfort (Graham & Kaleta, 2002). According to Balcytiene (1999), Bonk (2004a, 2004b), and Bersin (2004), the technologies-rich instructional tools are an integral part of the digital hyper-textual interactive and collaborative learning environment, which foster in students the desire to
improve content literacy for better understanding and comprehension of the content texts. Most important of all, blended learning is believed to benefit students’ learning satisfaction and performance outcomes (Garrison & Kanuka, 2004; Graham, 2013) because blended instructions stimulate learners’ cognitive skills development by means of its various interactive and collaborative learning capabilities (Garrison, Anderson, & Archer, 2001) such as hypertext, hypermedia, and multimedia tools not commonly found in traditional classrooms (Liu, 2013). In this case study, Keshta & Harb (2013) reported that the use of multi-media resources in a blended learning model boosts all students (including shy and low achiever students) towards independent practices. Other researchers’ findings showed that blended learning improves students’ study habits and engagement quality by maintaining the students on-task for a more intense and longer span of time (Amaral & Shank, 2010; Dillard-Eggers et al. 2011), supports knowledge retention and application in subsequent lessons (Roediger et al., 2011), and strengthens learners’ short-term and long-term progress by means of the online periodic assessments (Rawson et al., 2013; Hartwig & Dunlosky, 2012). In conclusion, research findings seem to concur on the same belief: Blended learning models that integrate both face-to-face and online instruction are effective because these models allow instructors to become more creative and innovative in planning their instructional materials and learning opportunities. The new innovative instructional methods are considered better and more efficient ways of supporting students in achieving the learning objectives and providing them with all possible learning experiences.
2.9.3 Increased Autonomy, Self-Pacing Practices, and Peer Collaboration

Nicol & Macfarlane-Dick (2006) defined the meaning of self-regulation, and described the relationship between self-regulation and feedback in the following manner:

The construct of self-regulation refers to the degree to which students can regulate aspects of thinking, motivation and behavior during learning. In practice, self-regulation is manifested by the active monitoring and regulation of a number of different learning processes, e.g. the setting of, and orientation towards, learning goals; the strategies used to achieve goals; the management of resources; the effort exerted; reactions to external feedback; and the products produced (2006, p. 199).

The digital course design with the embedded assessment tasks and end of chapter diagnostic tests offers frequent objective data for students to assess their own level of understanding of each lesson. To a certain extent, the digital learning environment enables students to exercise a maximum level of self-regulation and self-determination when they are engaged in a learning experience. Sheldon, Elliot, Kim, & Kasser (2001) believed that students need to exercise self-autonomy and self-determination in a learning situation to develop self-esteem, and to gain a sense of competence and efficacy. The opportunities for self-regulated and self-directed opportunities have the positive impact of stimulating the learners’ desire to achieve the learning goals, and the desire to share their learning experiences and successes with their peers (Deci & Ryan, 2002; Ryan & Deci, 2000). Codreanu, Chein, & Robin (2013) affirmed that one of the benefits of blended learning modality is its capability for increased opportunities for students to exercise and experience autonomy in decision-making. In a particular manner, Chang
(2005), Leakey & Ranchoux (2006), and Kessler & Bikowski (2010) believed that the blended learning environment increases students’ autonomy for developing personal interests because they can choose their favorite activities and assignments. Likewise, Hidi & Renninger (2006) explained that personal interest in an academic topic or activity is influenced by the student’s knowledge and achievement in that topic or activity. A blended learning environment creates more opportunities for students to develop their personal interests in different subject disciplines.

The blended learning environment with its multiple channels of learning tasks and feedback tools, serves to situate students in control of their learning process and, together with teachers’ guidance, enables them to adopt a proactive role in monitoring their own performance progress. The combination of in-person coaching and differentiated instruction creates a personalized learning environment. By spending one-on-one time with each student, the teacher is able to give attention to each student’s learning needs through tailor-made instruction. The Flipped Classroom strategy is an example of personalized, student-centered, as well as a collaborative learning approach (Tucker, 2012) where teachers present content knowledge in multi-disciplinary channels. The key to success is not only the instructional videos, but how teachers integrate the videos into the class lesson (Tucker, 2012). In all aspects, e-learning increases opportunities for all students, especially for language learners to collaborate and communicate with teachers and students through real-time and non-real time message boards (Alasraj & Alharbi, 2014).

In summary, most of these empirical studies share the same idea that the personalized features of blended learning and the rich online resources give more opportunities for teachers
to select a variety of reading materials and activities that are especially beneficial for differentiated learning. From the students’ view, the online platform offers students a flexible schedule, self-pacing study opportunities, and additional time for specific skill practices such as cognitive inquiry, critical thinking, problem-solving, and making real life applications, which are important learning strategies for content subjects. Above all, Edwards (2010) makes the point that this new way of blended learning is inexpensive because students can gain unlimited access to web resources that are part of the educational portal’s services.

**2.9.4 Feedback and Online Assessments**

In order for students to actively engage and to maintain the optimal level of interest in accomplishing a learning task, they need to receive regularly and consistently the teacher’s feedback in each phase of the performance task before going on to a new assignment. For these reasons, feedback contributes to students’ short-long and long-term success. The effectiveness of feedback intervention addressed to students must satisfy these conditions:

- Given at the appropriate level.
- Answer the questions of where to improve, how to improve, and what is the next step for improvement (Hattie & Timperley, 2007).
- The support is given at the time when students are still working on the assignment or performing a task, and needing the teacher’s help at the moment of executing the assignment (Brookhart, 2008).

The learners’ desire to improve their performance is to a certain extent conditioned by the teacher’s positive reinforcement in terms of inputs and the appropriate orientations and
indications that make sense to the student in such a way that the student is able to apply the indications to performing the task. A student expects the subject teacher to acknowledge and confirm that the precise learning goal of a particular topic or lesson is close to being accomplished or has been attained. In other words, a teacher’s feedback reinforces and confirms the teacher’s expectancy and the students’ ability to meet that challenge. By giving accurate and timely feedback to learners, teachers facilitate students to moving towards the objective goals in an inclined path until these goals are accomplished.

The two functions in blended learning that enhance students’ continuous progress in attaining goals achievement are the online assessments and feedback tools that are available for students in the e-learning component of the course portal. The blended learning educational portal is designed as a centralized educational management system with various digital-functions of instruction and learning. It contains important information about the students’ profile and performance data, which teachers can easily assess at a glance. Students can also review their own performance data from their terminals. The e-learning course site within this course management portal has the strategic function of providing immediate feedback to students (Keshta & Harb, 2013). The immediate and automatically generated feedback function of the online tool is a valuable characteristic because it allows students to self-assess their performance using the unit quizzes or end of chapter examinations provided by the digital course site.

Online assessments and feedback also offer opportunities for students to self-regulate their learning strategies to achieve objective goals at their own pace. For the instructors, online feedback allows the instructor to use the standardized rubrics to grade students and return the test results with comments to students immediately without having to wait for the next class. In
general, online feedback allows teachers additional flexible time to respond to students’ needs (Keshta & Harb, 2013, p. 218). The online system also allows students to respond to teachers’ paper grades or make further inquiries related to the project assignments as soon as they have read the teachers’ feedback. Teachers can then follow-up students’ responses and identify each student’s difficult areas in order to re-design or re-teach the lesson on the following day. One can observe that while immediate feedback benefits both instructors and students, it is safe to draw the conclusion that the teachers’ personal commitment and effective instructional skills contribute greatly to make the biggest difference to children’s achievement progress (Monteiro, Almeida & Vasconcelos, 2012). The students’ disposition to be continuously engaged in a task assignment in class or offline also depends on other factors as course relevance, interest, and the disposition to learn (Lim & Morris, 2009).

2.10 Challenges of Teaching with the Digital Curriculum

In spite of the many benefits observed in the digital curriculum, a few research findings revealed that some teachers and students encounter various challenges in the way textbooks are formatted that affect teaching and learning, and therefore, require instructors to continuously evaluate their instructional strategies to make the best use of the standardized curriculum to improve teaching and learning (Bonk & Graham, 2005). Furthermore, the “process of developing curriculum maps required faculty to draw explicit connections between content, skills, and assessment measures at the course level” (Herring & Wilson, 2010, p. 49). For example, Precel, Eshet-Alkalai, & Alberton (2009) examined online courses with respect to pedagogy, textbook format, and learning environment usability, and found two major issues that are problematic as
related to pedagogical and course design. The first issue is related to the online pedagogy approach. The authors believe that the major problem of most online courses is that they are designed, developed, and written not by the instructors in academia but by experts who had no experience teaching from the materials. Therefore, the challenge for teachers consists of redesigning the different components of the course syllabus, which may include instructor information, course description and objectives, course materials, and course schedule and course calendar, and a set of guidelines for participation (Orleans, 2014, pp. 29-30). Another challenge that teachers face is that they do not have control over all the factors that affect student learning. For example, online learners need another level of cognitive and digital skills in order to be able to use online technologies effectively. “Teachers more than ever have a vital role to play in helping students realize their futures by providing them with instruction that gives direction and allows them to hone their new cognitive and technological skills” (Daggett, 2010, p. 3). Still another challenge that subject teachers may face is that they may not be disposed nor have the occasion to give technology training to students. Therefore, student training must be part of the blended learning course implementation process.

From another perspective, Precel, Eshet-Alkalai, & Alberton (2009) reported that while most of the students preferred interactive elements of the discussion group and constructivist tasks in the blended learning environment, there are substantial findings indicating that many students still prefer the easy navigation of reading academic texts in the printed format rather than the digital texts format. These researchers identified three issues that are obstacles to digital reading for some students: 1. Low-level ownership. 2. Loneliness. Physical reinforcement seemed to be an important factor to maintain engagement in learning. For example, contacts
with the instructors in the face-to-face environment have positive effects on student achievement (Lazenby, 2003; Bates & Khasawneh, 2007). 3. Lack of digital skills among teachers and students (Precel et al., 2009). In spite of some of the challenges and barriers students are facing in the blended learning environment, the majority of the empirical studies continued to assert that blended learning offers high promise for learning success once teachers learned how to overcome these obstacles (Ackerman & Goldsmith, 2008, 174-190).

2.11 Teachers’ Leadership Role in the Blended Classroom

The instructor’s role, instead of being the director on the stage in a typical traditional classroom, now becomes the designer of learning environments, creating opportunities for learners to synthesize information and construct new ideas (Allen, 2004). In a unique and subtle way, the teachers’ educational beliefs have a profound effect on how they interact with students and inspire them towards goal achievement in the blended classroom. In return, students normally respond with appreciation when teachers care, listen, and connect with them (Zakrzewski, 2012; Ostrosky & Jung, (n.d.). In relation to the imminent role that teachers play in the instructional process, the subsequent authors articulated three aspects of teacher-student relationships for our reflection and consideration: “Education is an action”, “Education is a reciprocal action”, and “Education is a reciprocal help” (Altarejo & Naval, 2004). The first point, ‘education is an action’ entails a communicative process of transmitting knowledge from the one who knows to the one who receives. According to Aristotle, the transferring of knowledge is possible because by nature all men have an innate desire to learn. The student’s motivation is enhanced when the teacher facilitates the attainment of goals (Aristotle, 2011). Thorndike
(1931), who is considered the father of educational psychology, similarly emphasized “Man’s power to change himself, that is to learn, is perhaps the most impressive thing about him” (1931, p. 3). The author further described that a man’s capacity for knowledge enables him to develop new discoveries and inventions by building on previous accomplishments. In summary, the teacher’s leadership role directly and indirectly influences students’ motivation in the learning process.

The authors brought out the second point that ‘Education is a reciprocal action’. This seems to imply that a person is not living in isolation, but always in a give and receive position. Learning is a benefit for oneself as well as at the service of the others. Through teaching and role modeling, teachers play the connecting link of preserving the values, language, and contributions of the particular culture available for the next generation (Altarejos & Naval, 2004).

The third point the authors emphasized is that ‘Education is a reciprocal help’. In the learning process, the teacher directly influences students’ behavior. A teacher uses different methods and strategies to help students achieve understanding of a topic, problem or situation. On the other hand, students’ achievement and success are often translated into teachers’ rewards and professional satisfaction (Altarejos & Naval, 2004).

In the blended learning environment, both the instructor and students play an active reciprocal role in students’ learning process. Teachers are called to deliver interesting self-study designed lessons consisting of a wide range of interactive activities that encourage collaboration among learners, as well as the more structured lectures in the physical classroom. The new vision of learning encourages teachers to incorporate short and live events or short video clips to improve the quality of instruction and produce a more dynamics learning environment in order
to make a difference in the educational experience of each student. Learning in the e-culture is characterized by the relationship of information sharing, collaboration, and reciprocal support between teachers and students. With respect to instructional content, teachers play an important role in choosing the appropriate learning environment, and the course design in developing a course curriculum to meet the needs of a particular student population (Ellis, Steed & Applebee, 2006). Therefore, the reciprocal relationships of giving and receiving, understanding and appreciation, sharing and collaboration not only have gained a new theoretical and practical significance, but are highly tangible and touchable in today’s e-learning academies.

A practical application of ‘reciprocal help’ is reflected in The Conditions for Learning, in which Gagne (1985) described nine teaching practices in the classroom, which demonstrate the dynamic reciprocal relationship between teachers and students in the process of instruction and learning: (1) Gaining students’ attention, (2) informing learners of the learning goals, (3) stimulating prior knowledge, (4) presenting appropriate stimulus, (5) providing learning guidance, (6) providing feedback, (7) eliciting responses, (8) assessing performance, and (9) enhancing knowledge transferring. The teachers’ skillful and effective integration of Bloom’s Taxonomy thinking skills with each of these instructional events can help teachers design creative and stimulating instructions.

There are substantial empirical studies indicating that Teacher Education on instruction technologies, technical and pedagogical support is the necessary preparation for the effective use of online resources within the blended learning environment (Porter et al, 2014). These findings also call attention to the importance of professional development and technology training prior to the implementation of blended learning. That is to say, adequate professional development
and technology training would alleviate concerns about modifying the teaching style to the blended format. One important barrier that influences teachers’ attitudes toward the adoption of a technology-rich blended learning curriculum is the difficulty they encounter during the transitioning process of converting teaching materials into e-teaching formats (Moukali, 2012).

In the study conducted by Yidana (2007), several factors were examined regarding faculty perceptions of technology integration in the teacher education curriculum: (1) Faculty attitudes towards technology integration within the curriculum (2) Faculty motivation for adopting instructional technology (3) Faculty perceptions of challenges to adopting instructional technology (4) Faculty perceptions of the effects of instructional technology on students and pedagogy (5) Faculty perceptions of technology regarding the need for professional development. The findings supported the general opinions that the majority of faculty members are receptive to the use of new technology for teaching. Teachers with higher levels of computer skills tend to use computers in broader and more sophisticated ways with students than those who have a lower level of technology skills. Sufficient studies also indicated that Teacher Education and Training on the use of blended technologies are crucial supports because most online courses are still not user-friendly, as has already been mentioned in the previous section of this paper, and therefore presents additional challenges to teachers who are experiencing blended learning methodologies for the first time. For this reason, numerous research findings recommended that Teacher Education in the form of technology training is crucial for preparing teachers to deliver quality education in the new blended learning environment. These studies underlined the fact that the new form of education requires teachers to possess advanced and sufficient knowledge on managing the course portal, and familiarizing themselves with the
interactive learning environment (Bauer & Kenton, 2005). The new instructional paradigms specifically require that teachers learn how to effectively use the communication and data collection tools to give feedback and deliver data reports to students for instructional and learning purposes in a timely manner. Consequently, technology training for teachers is extremely necessary to build technology know-hows from basics to more sophisticated usages (Justis, 2012). Similarly, Beisser & Steinbronn (2002) and Barr & Tagg (1995) treated the themes of quality education and teacher development extensively at the university level. In broad strokes, these authors believed that teaching is not just about transmitting facts, concepts, or understanding the principles based on the curriculum, but how teachers use learning activities to enable students to understand the learning materials to achieve learning outcomes.

On the particular topic of instructional quality, Anderson & Dexter (2005); Ellis & Calvo (2007); Masoumi & Lindstrom (2011) are in agreement that professional training is necessary for teachers to learn how to establish quality control measures when implementing a new technology initiative to ensure instructional excellence. The emergence of digital technology changes the teacher’s leadership role from purely academic instruction to include technological literacy (Chang, 2011). The incorporation of modern technologies into the curriculum requires teachers to discover new ways to develop advanced skills in support of new technology initiatives. The following is a case study of the benefits of a professional training program that is worth examination. Kang et al. (2013) used Kirkpatrick’s 4-level model (Reactions, Learning, Behavior, and Results) to examine whether the technology workshop had any significant impact on the effectiveness of the blended learning STEAM training they developed and implemented in their department. Their case findings show that as the result of professional training, teachers
learn to focus more on evaluating students’ abilities for determining their achievement levels. Some teachers became more interested in the STEAM program after participation in this training. Moreover, teachers’ knowledge of technology skills and their different approaches regarding how technologies should be used determine the kinds of professional development and training needed. The research findings implied that designing a blended design involves consideration of different levels of blended learning implementation. For instance, the low impact blend consists of adding extra activities to the existing course, medium-impact means replacing activities in an existing course, and high-impact blend encourages teachers to build a blended course from scratch.

On another aspect of teacher leadership, Agostini (2013) conducted a multiple case study entitled The Role of Leadership in Starting and Operating Blended Learning Charter Schools. This study made noticeable contributions in defining the concept of teacher leadership in the new learning environment. One important skill Agostini attributed to teachers is their capability to leverage resources to customize students’ learning according to individual needs. On this point, Okojie et al. (2006) and Borthwick & Pierson (2008) emphasized the importance of training teachers not only on hardware and software applications, but also helping them increase their competency by expanding their knowledge-based technology skills in directing specific technologies towards improving instruction and learning in the new learning environment.

Surely, part of creating an active learning classroom is the teachers’ ability to explain with depth and clarity the organization of the course syllabus posted in the course site, and is able to share with all participants the benefits blended learning could contribute to transforming learning into successful experiences. Lim & Morris (2009) defined ‘quality instructor’ as a person
who has command over subject content and has the ability and skills to make “clear and understandable presentations in class” (p. 284). Looking at the varieties of learning opportunities in the blended classroom, most teachers believe that the role of a teacher in the students’ learning process has not diminished but has increased. By performing direct teaching in the face-to-face instruction, the teacher performs the immediate role of a coach and moderator in real-time situations. In the computer lab, the teacher could assign online tutors to support students in their online activities. In all cases, the teacher chooses the delivery medium according to the content materials, determines the best delivery method for each objective learning goal, and assesses students according to each student’s learning level. For instance, the teacher could assign self-paced format assessments where students test themselves by using the online quizzes or unit tests to match with self-paced learning activities.

In another view, Lumpkin (2008) defined the teacher’s leadership role to include both educating and instructing. Parallel to this view, Shim described the role of leadership underlying the ideas of character education: “The teachers play an important role in facilitating the growth of individuals and the formation of a good community” (2009, p. 515). These empirical findings suggest that the transitioning of instruction and learning from a traditional mode to the multi-level mode poses new challenges as well as opportunities to educate students. As e-learning environments opened up more occasions for students to explore the world and develop global connections with others in different parts of the world, teachers must also extend their responsibilities by helping students learn how to express their opinions and perspectives respectfully towards the views of others in the communication process.
In summary, most teachers believe that the incorporation of blended learning technologies require more lesson preparation time in every aspect of teaching: updating the course site, grading assignments, keeping abreast with student submission of assignments throughout the day, providing students’ feedback in a timely manner, and including the need to improve their time management skills. Moreover, since teachers are not only instructors, but also educators who educate and co-partners with parents for the academic and personal development of the learners (Altarejos & Naval, 2004; Bernal, Altarejos, & Rodríguez (2008), teachers need the support of professional development in order to acquire new capabilities and gain competency in their leadership role.

2.12 Blended Learning Supported Literacy Program

This literature review of blended learning supported literacy programs covers two main areas: (1) The Social-constructive Approach to Blended Education. (2) Implementing Literacy Learning in the Blended Classroom.

2.12.1 Social-constructive Approach to Blended Education

The social-constructive approach reflects “a shift away from behaviorism to cognitive psychology in the 1960s” (Breeze, 2012, p. 43), which led to many changes in the way in which learning was conceptualized, and instruction was organized in the blended classroom. The cognitive theory of learning inspires educators to explore the idea that “the inner working of the mind can be studied, that complex skills can be broken down into interacting constituent parts and that learners are agentive thinkers who generate hypotheses which drive the learning process forward” (Breeze, 2012, p. 43). The social-constructivist theories, which follow on this,
were able to take in many of these notions, while also relating them to the meaningful role of teachers and peers, and to the importance of social and cognitive support in enabling students to engage in active learning, build knowledge and acquire skills. Since then, research focus has been directed to the study of both the individual’s cognitive domain, and ways of supporting students so that they apply learning strategies to construct new knowledge based on their current and prior knowledge and experiences (Gagne & Driscoll 1988; Pressley, 2001; Alexander, 2005).

Within the educational contexts, both Piaget (1962, 1989) and Vygotsky (1978) conceived learning as a constructive process (Ref to Sections 2.5.2 and 2.5.4). While Piaget’s focus is more on the philosophical and personal aspect of constructivism, Vygotsky’s is concerned more with the social aspect of constructivism (Jones & Brader-Araje, 2002). In a synchronous blended classroom, the students have greater opportunities to engage in a learning process that allows more communication, interaction, and collaboration among peers, which are all characteristics of a constructive and student-centered learning environment.

2.12.2 Implementing Literacy Learning in the Blended Classroom

A “model of literacy progression” (Shanahan & Shanahan, 2008, p. 43) is conceived as having three stages of development:

Basic Literacy: Literacy skills such as decoding and knowledge of high-frequency words that underlie virtually all-reading tasks.

Intermediate Literacy: Literacy skills common to many tasks, including generic comprehension strategies, common word meanings, and basic fluency.

Disciplinary Literacy: Literacy skills specialized to history science, mathematics, literature, or other subject matter (Shanahan & Shanahan, 2008, p. 44).
In designing an adolescent literacy development program, it is important to identify the appropriate level literacy curriculum for each grade level student before implementation. Teachers must be aware that high school students are challenged with more complex and difficult content materials and documents that require “high school-appropriate literacy skills” (Shanhan & Shanahan, 2008, p. 43) to decode and comprehend content meaning (Heller & Greenleaf, 2007, p. 4). In terms of knowledge acquisition and the learning process, the cognitive theory emphasizes the “process-focused approach, which contrasts sharply with product-focused instructional models” (De La Paz & McCutchen, 2011, p. 32).

On this topic, quite a number of studies emphasize the importance of instructional practices that foster flexible thinking to support individuals’ knowledge building process (Spiro, Vispoel, Schmitz, Samarapungavan, & Boerger, 1987; Spiro, Coulson, Feltovich, & Anderson, 1988; Spiro, Feltovich, Jacobson, & Coulson, 1992; Spiro, Collins, Ramchandran, 2007; Cartwright, 2008). These authors claimed that there exists a reciprocal relationship between the learner’s literacy process of reading and writing, and the teacher’s literacy instruction and practices. “Reading, writing, and literacy instruction are all complex activities that require individuals to coordinate information from many tandems” (Cartwright, 2008, p. 5), and the ability to “process multiple features or representations (Cartwright, 2008, p. 10). In particular, Cartwright believed that teaching students with a wide range of flexible reading skills can enhance an individual’s ability “to process text comprehension, monitor one’s own comprehension, adjust one’s level of attention to match the level of difficulty of a text, flexibly access and apply knowledge, and maintain awareness of one’s purpose for reading” (Cartwright, 2008, p. 7).

To stimulate individuals’ cognitive process in reading, teachers may support them though
particular skills such as pre-reading, reading aloud with a partner, in small group instruction or interacting with digital text (Blanton, Wood, & Moorman, 1990; Dechant, 1991; Hansen, 2008), and using word-recognition strategies that specifically pertain to each disciplinary subject to stimulate the cognitive development (Beck & Carpenter, 1986). To stimulate students to develop interests in content area subjects and to improve the quality of learning, teachers must use reading strategies that are applicable to specific domains such as Science, Math, History, or Social Studies, (Barton, Heidema, & Jordan, 2002; Greenleaf, Brown, & Litman, 2004; Norris & Phillips, 1994; Mosborg, 2002; Britt et al. 1999). In terms of literacy instruction, Nuttall (1982) pointed out that both informational and language literacy strategies are important tools to achieve academic competencies in all courses of studies. Students often have to analyze, evaluate, and prioritize an abundance of information choices in their academic studies, in the workplace, and in their personal lives. In other words, teaching students by a strategic approach to learning is the key to deep learning. To this effect, the numerous empirical studies mentioned above supported the importance of creating the optimal conditions for integrating the strategic approach to achieve the highest effectiveness of blended environment.

The effective integration of Bloom’s Taxonomy thinking skills within the blended classroom (the face-to-face and online situations) could help teachers design creative and stimulating instructions. The use of comprehension strategies is one of the most essential drivers of students’ literacy development. These strategies include, but are not limited to, the following: Making connection to prior knowledge (Correia & Bleicher, 2008; Taboada & Guthrie, 2006), visualizing and use of graphic and semantic organizers (Ness, 2009; Iranmehr, Davari, & Erfani, 2011), vocabulary building (Zimmerman, 2012), wait-time questioning (Singh & Hashim, 2014),
predicting, summarizing, inferring references, determining important information from text, synthesizing, and monitoring the comprehension of text (Kispal, 2008; Fan, 2010; McNamara, 2007). Additional reading comprehension strategies include: Comprehension monitoring and cooperative learning (Kingner & Vaughn, 1999; Bremer, Vaughn, Clapper, & Kim, 2002). These learning strategies can be conceived as cognitive operations applicable across a variety of content subjects, texts, and contexts (Ackeman & Perkins, 1989). There exists also a relationship between reading and writing (Koons, 2008). Numerous theories emerged in recent years regarding the relationships of reading, writing, and instruction that might affect an individual’s literacy skills development process. For example, teachers attempted to develop students’ reading comprehension proficiency by using effective reading comprehension strategies, and making references to the revised version of Boom’s Taxonomy thinking skills as a stepping stone for improving reading and writing (Fox & Alexander, 2011; Duke et al., 2011).

Many literacy writers believed that writing and reading are linked to a complex cognitive process of activities that require an individual’s ability to coordinate information from many sources, and the communicative skills to interpret and transfer this acquired information to others effectively in speaking or writing (Cartwright, 2008; Duffy, 2003; De La Paz & McCutchen, 2011). The blended learning classroom provides an excellent environment for students to exercise this cognitive process. For example, the various “knowledge creation” initiatives, such as group conference and online discussion threads where participants come together to scaffold new knowledge and understandings, require that individuals contribute their personal responses. Consequently, students need to achieve a greater level of synthesizing and evaluation skills in order to participate in these events fully, meaningfully, and fruitfully. Teachers are expected to
facilitate these knowledge-creation processes by supporting students with engagement and motivational strategies such as helping students to develop scaffolding techniques using prior knowledge, rich vocabulary logs, and communication strategies to enhance the quality of discussion and learning situations (Duffy, 2003).

On this note, Fox & Alexander emphasized that there is a critical need for today’s students to develop a broader concept of reading comprehension by including thought processes such as “reflection, critical evaluation, identification of patterns and relations accommodation of new ideas, and application” (Fox & Alexander, 2011, p. 15). Teachers should encourage students to apply comprehension and learning strategies in the studies of content subjects as well (Ness, 2009). Students need to take note that “reading activities in the different content areas are associated with different purposes and therefore call for different attitudes and skills” (Fox & Alexander, 2011, p. 22). Although it may not be the role of subject teachers to teach students basic reading and writing skills, content teachers have the responsibility of providing instruction regarding the kind of reading specific to each academic discipline “that students will need in order to comprehend course materials and complete written assignments successfully” (Heller & Greenleaf, 2007, p. 26). In the blended learning classroom, teachers are empowered with the rich online resources available for instruction and recommendations.

Indeed, there has been a large quantity of research studies on technology integrated literacy programs in which various aspects of blended features demonstrate tremendous advantages toward improving literacy in both the humanities and non-humanities subjects. Blended learning creates an interactive atmosphere by incorporating technological interactive and multimedia tools in the online and face-to-face components. Interactive learning (Liang &
Bonk, 2009), which is an outstanding characteristic of the blended learning environment, can be characterized as technology interaction such as “photo-realistic technical animation, MP3 quality audio, and search capability to the mix” (Carman, 2005, p. 4), textual interaction such as “induce readers to image cognitively the objects and events” (Tierney & Cunningham, 1980, p. 26), and social interaction generated by “small-group work and whole-class discussion” (Nystrand, 2006, p. 398).

In the face-to-face component of blended learning, students benefit from the real, direct, and personal communication contributive to a personal learning environment. In the online platform, the introduction of online communication medium such as audio file, discussion boards, e-lists, discussion groups, chat or conferencing, email, news groups, and social-networking software such as podcasts, social-networking sites, weblogs and wikis (Eng & Muuk, 2015, p. 295) are equally supportive to content literacy development because these technology tools provide unrestricted opportunities for every student to input and respond to inquiries, and engage in critical thinking and reflections (Cheung & Hew, 2011), thus leading the participants to arrive at a deeper level and more conceptual understanding of the texts’ content (Díaz & Entonado, 2009).

The online digital curriculum of the blended learning literacy course design is one of the strongest features highlighted by many research studies as having a great impact on disciplinary content support (Liu, 2013). From the instructors’ perspective, the digital curriculum enables teachers to flexibly organize objective goals, select reading activities and tasks, introduce content area related resources and references for both high and low achievers at different literacy and grade levels. From the students’ perspective, the digital curriculum enables immediate feedback
and responses where students can access the information anytime and anywhere (Behjat et al., 2011; Liu, 2013; Liang & Bonk, 2009; Dori et al, 2013; Grgurovic, 2011). One of the most important contributions of e-learning to literacy development of content learning is the content vocabulary building strategy. The e-library helps students to learn new words and compare definitions from numerous websites’ vocabulary libraries (Alasraj & Alharbi, 2014; Pellerin & Montes, 2012; Essam, 2010). Another contribution of the online medium is the use of “virtual worlds” in a blended synchronous experiment illustrated by Bower et al. (2013), which demonstrated positive progress towards facilitating and building language literacy skills.

In conclusion, blended learning with its e-learning component provides students with a more stimulating learning environment through a wide range of multi-media resources. As Ghirardini (2011) pointed out, within the cognitive domain, students’ thinking skills can be developed by engaging them in interactive e-learning activities (Ghirardini, 2011, p. 9). Most important of all, blended learning is effective in motivating students towards independent practice of the reading and writing skills which are important in improving understanding of the English language.

2.13 Learning Virtues in Support of Learning Success in a Blended Classroom

One factor often ignored in the ongoing discussions of blended learning is the crucial need for students to develop a responsible attitude and take control of their own learning. This is directly related to character development, and to the cultivation of learning virtues. The seven learning virtues mentioned by Li (2013) are extremely necessary in the blended learning environment because students spend half of their time engaging in independent and self-
regulated study or in collaborative group learning situations where they have more opportunities to socialize and participate in collaborative work with their peers. By definition, collaborative and cooperative tasks are active learning activities that help students work together to produce positive results. This process requires individuals in the group to develop a sense of partnership, to work together to establish a common purpose and goal, to develop the capacity and ability to share responsibilities, and to offer mutual support to each other in the process of building new knowledge.

In the process of self-regulating one’s studies, there is a stronger demand to develop a higher level of discipline in order to master learning and stay motivated throughout the year. As Barnard et al. (2008) pointed out, since “online learning environment is characterized with autonomy, self-regulation becomes a critical factor for success in online learning” (p. 1). For the same reason, “lacking self-regulatory learning skills may misconstrue the autonomy of the online learning environment and, as a result, may not accomplish learning tasks they are expected to complete in online courses” (p. 1).

While teachers have the call to prepare students to become authentic learners in order to benefit from teachers’ quality teaching, students have their share of responsibility in becoming constructive learners. Students will not gain from any quality instruction or benefit from effective technologies if they are not equipped with habitual learning virtues. Li (2013) discussed seven learning virtues that are important for building intrinsic motivation: “I have identified seven core-learning virtues: sincerity, diligence, endurance of hardship, perseverance, concentration, respect for teacher, and humility (p. 49).
According to Li, students need these learning virtues whether they are in a traditional or non-traditional learning environment. These virtues “denote personal qualities and dispositions that are regarded as highly positive and desirable for any learner.” Examination of the learning virtues strongly suggests that it is important to educate children to acquire these virtues in their early years in order for them to be well disposed for more challenging demands in college and in the workplace. Li describes how learning virtues work for learners:

1. Sincerity stresses the self-chosen nature of a person’s decision to pursue sagehood. It is the honest and authentic commitment that the person asks of him or herself as the target of learning.

2. The second virtue, diligence, urges the learner, after a sincere commitment has been made, to pursue a course of action so that his or her commitment will be followed through.

3. Endurance of hardship focuses on overcoming difficulties one is bound to encounter in learning.

4. Perseverance concerns the lasting desire for learning from the beginning to the end.

5. The fifth virtue, concentration, emphasizes studying with extended consistency and extended attention and focus.

6. The sixth, respect for the teacher, renders the learner to be receptive to the teachers’ guidance.

7. The seventh virtue is humility. Humility directs one to regard oneself as always in need of self-improvement no matter how much one has achieved in life. Humility is
believed to be particularly important when one reaches high levels of achievement (2013, pp. 49-52).

By building on the learning virtues, students are equipped with a higher level of ownership in their studies. At the same time, these learning virtues can serve as the solid foundation for developing students’ intrinsic motivation. Educational psychology defines motivation into two classifications – intrinsic and extrinsic. “Intrinsic motivation is defined as the doing of an activity for its inherent satisfactions rather than for some separable consequences,” (Ryan & Deci, 2000, p. 56). Technologies cannot in any way perform the work of learning for students whether it is through online or onsite instruction, inside or outside of the classroom, unless students are disposed to learn. Teachers, on the other hand, can change students’ motivation level so that they increase the desire to learn; they can work with students to cultivate the learning virtues to build a solid foundation for developing good study habits in school, at home or at work. By fulfilling the authentic mission of education and specifically by helping students to develop the affinities towards learning, teachers are indeed performing one of the greatest services to humanity. Li echoed this message by saying that teachers are not just employees who fulfill a contractual obligation, but are entrusted with the responsibilities of teaching humanistic and scientific knowledge. Ryan & Deci (2000) are consistent with Li’s idea that teachers serve as role models. Teachers are role models for students; they serve as desirable examples to be followed and imitated. The good example, inspiration, and support a teacher offers to a student cannot be replaced or substituted by any non-human means such as technologies. When students conscientiously respond to teachers’ positive guidance, they enable
teachers also to experience the rewards, the fulfillment, and the joy of their work. Therefore, education is truly a reciprocal help (Altarejos & Naval, 2004). Besides being communicators of knowledge, teachers are also change agents with respect to students’ character development. By combining good habits and utilizing the best technology tools under the supervision of quality teaching, all will add up to improving and increasing the students’ academic achievements.

2.14 Parents’ Involvement in the Blended Classroom

The blended learning environment increases the opportunities for parents to be involved in their children’s education. This parent-teacher partnership is strongly encouraged in schools that implement blended education. The purpose of the Teachers-Parents end-of-term conference is to allow teachers and parents the opportunities to meet occasionally so that collaboration between teachers and parents is facilitated to support children’s education at school and at home. The blended approach to learning embraces the concept of providing more opportunities for parents to support students’ learning by making students’ information more available and assessable to parents and guardians. The parents have the password through the parents’ login center to access their child’s grade records, class schedule, examination dates, school project due dates, and extra-curriculum activities. Since the digital course site in blended education is now online, parents can find out what students are learning in school. In addition, students’ academic progress and any information related to school life are available to parents through the course portal. Parents can stay in communication with teachers any time instead of waiting for the end of the term when Parents’ Conference Meeting is held. In a much more extended manner, the blended education allows parents to be better connected with the school’s instructional team.
Teachers and parents are able to work collaboratively to provide timely academic interventions whenever there is a need.

Substantial literature reviews pointed out that both parents and teachers are key educators in a child’s life. The concept of teacher-parents partnership is again made transparent in the book “Family as Primary Educators,” in which Bernal, Altarejos, y Rodríguez (2008) emphasized that teachers must appreciate the unique power parents have in this regard. “The perception of their children as unique and irreplaceable gives parents the moral and psychic energy to preserve confidence” (2008, p. 27). Students feel secure when teachers and parents work together to ensure their confidence in what they are learning, and help them move forward when they face frustration, such as not being able to keep up with school work, or not able to advance as fast as their peers. Teachers and parents are models for students developing good study habits in the adolescence ages. Children become confused when they encounter different expectations from teachers and their parents. Therefore, collaboration among teachers and parents is the key to presenting a set of shared beliefs and objective learning goals to the learners.

There is an even deeper reciprocal relationship of love and responsibilities between parents and children (Altarejos & Naval, 2004). These authors distinguished family education as different from formal school education in two senses: Family education is a form of influence that impacts the formation of the human personality. The above message implies that a person develops a sense of ‘self’ and gradually learns to understand his or her own identity from the experiences of dealing with parents and siblings. This self-perception deepens and further develops as children socialize and interact with adults and their peers at school, while continuing
later working as a professional. Family education is relevant to the question of personal identity in the sense that “The interpersonal relationships that constitute the family reveal the dialogical nature of the human being” (Bernal, Altarejos, & Rodríguez, 2008, p. 42). The authors also described that each family is a unit and the most basic block of society; it is a vehicle for the lifelong humanizing process that every person must experience. Education does not necessarily take place through “instructional programs or planned moral teaching” (2008, p. 21). “Family education is precisely the joint and cooperative formation of ethically good habits.” (2008, p. 21). “It is the relational aspect of human love, the source of the security that people, especially children, need and that serves as a buffer against the sharp edges of social relationships” (2008, p. 26). The above literature suggests that there is a clear link between parent involvement and children’s success in school. Parents are instrumental for children’s success by fostering in them a sense of self-confidence, a “feeling of competence,” and developing positive attitudes towards academic learning (Grolnick, Friendly, & Bellas, 2009, p. 2). An additional point that parents must keep in mind is that new instructional mediums and e-learning platforms will continue to change and develop for the purpose of improving the learning environment for students to achieve success. One thing that remains unchanged is that parents will always play the major role in a child’s education and development. Parents play the leadership role of setting high expectations for children to follow, cultivating the disciplinary habits necessary for acquiring the learning virtues, and providing the home environment that fosters children’s curiosity about learning experiences (Scharf, 2009).
2.15 Summary of Literature Review

The literature review findings can be summarized in the following key points that are useful for the model design of this research study.

• Technologies empower the blended classroom. However, technologies do not replace teachers, who still bear responsibility for students’ success and performance outcomes.

• Blended mixes of technologies support both the mainstream and English Language Learners in content subjects’ achievement through interactive and multi-level activities. The appropriate use of technologies in each of the blended platforms empower the delivery of instructional materials with colorful, engaging images, and permit students to make real world connections leaving lasting impressions in the mind.

• Blended instructional methodologies help the teachers to create a strong student-centered learning environment that impacts positively on student participation and engagement.

• Blended technologies motivate teachers and students with the desire for more and frequent development and training on technologies. Students are inspired to become technology literate to be ready for the challenges of today’s advanced technology.

2.15.1 Principles for Blended Learning Design and Research Questions

This review of literature points out many of the advantages of blended design in general contexts, and specifically for literacy instruction. It explains some of the underlying theories of learning that should inform the design of blended learning platforms, and also discusses issues such as parental support and learning virtues, which are often ignored in the bibliography of this subject. To summarize, we have seen that blended learning programs should have:
• 1. A workable and practical administrative/organizational model

• 2. A flexible platform

• 3. A teacher-training program

• 4. A student-training program

• 5. A technology plan for short-term and long-term support

Moreover, blended learning programs should be informed by:

• 1. Sound theories of learning

• 2. Recent experiences

• 3. Updated instructional technologies

• 4. Evidence-based research studies

And they should take into account the following factors:

• 1. The role of parents

• 2. Support for the acquisition of learning virtues

• 3. Continuous professional development for teachers

**2.15.2 Research Questions:**

We must also note that much of the research reported in this chapter is from the field of higher education, where the challenges facing both students and teachers are quite different from those at high school level, where pupils are still acquiring the basic skills of literacy and numeracy, and where many students have grave educational difficulties. On the basis of this review of literature, the researcher was able to respond to the thesis statement to formulate the following research questions for application in the present dissertation:
1. In the high school setting, do student achievements in each subject taught with the blended learning method of instruction differ from achievements in each subject taught without the blended learning instruction?

2. How does the new blended learning model affect teachers’ beliefs about blended instruction and lesson delivery?

3. How does the blended method of learning affect students’ beliefs about the e-learning environment in the different components of the blended design: The face-to-face, online experience, blended learning?

4. How does the use of blended instruction affect students’ literacy achievements regarding content subjects’ reading comprehension in terms of the following?
   - Making connections with prior knowledge.
   - Visualizing concepts and ideas.
   - Asking meaningful questions to determine text importance.
   - Make the inferences, and synthesizing content materials.

5. How does blended methodology influence students’ engagement, involvement, and motivation towards learning?

6. How does the new blended learning methodology bring about a change in parents’ beliefs towards education?
CHAPTER 3: METHODOLOGY AND PROGRAM DEVELOPMENT

3.1 Research Design Overview

The literature reviewed in the previous chapter covered a variety of themes and issues concerning the integration of blended learning instruction into content areas learning. This rich research-based information provides new insights on the state of the art of blended learning in contemporary colleges and universities. Even though some research findings may not be applicable to the high schools’ learning environment, understanding blended learning practices in higher education make it possible to select the most appropriate research design and methodology to address the research inquiries stated in this study.

This chapter begins with a description of the context where both the main and pilot study was conducted, demographic and skills information about participant teachers and students, followed by an account of focus meetings where the researcher and the team of participant teachers worked collaboratively to design, develop, implement, and assess the literacy program model. In particular, detailed descriptions were directed to the designing of the digital curriculum, planning of instructional strategies and teaching notes, and the selection of technology tools for both the online and face-to-face classrooms.

To obtain important information with respect to the impact of blended technologies on literacy instruction and learning, the researcher conducted interviews with teachers and students to understand their opinions regarding the effectiveness of blended learning strategies on students’ progress. Specifically, the interviews with teachers and students were focused on how teachers used blended learning strategies to support student achievement in each subject, and
what perceptions students might have about their academic performances and progress in the blended learning environment (Porter et al., 2014). The last section explains in detail the tools the researcher used to collect data, including descriptions of the scheduling and organization of the data collection instruments and procedures in preparation for the subsequent chapter on data analysis of the research results for concluding the research study.

3.2 Rationale for a Mixed Research Approach

This research study used a mixed method of both qualitative and quantitative features to achieve the research objectives. Quantitative data has the advantage of providing the researcher with the statistical numbers for objective evaluations. At the same time, the quantitative analysis has the disadvantage of giving only the figures but is unable to provide the explanation for the ‘why’ of the research results. From this perspective, qualitative data has the noted benefit of generating rich data, “leaving the participants' perspectives intact” (Weinreich, 2006, Para 6), offering a descriptive and detailed explanation behind the comparative quantitative data. The qualitative approach uses not just one lens but also “a variety of lenses, which allows for multiple facets of phenomenon to be revealed and understood” (Baxter & Jack, 2008, p. 544). Haller & Kleine (2001) described the qualitative research approaches as including “case studies, personal experiences, introspective accounts, life stories, interviews, observations, histories, and visual texts” (p. 93). The same authors described how case studies “provide a window to examine phenomena from the perspective of the individual who is living the experience” (p. 93). Mann & Richards (2011) described how qualitative research places the researcher in a position to observe participants in real world situations and activities so that one can “study things in their natural
settings, attempting to make sense of or to interpret phenomena in terms of the meanings people bring to them” (Dezső & Lincoln, 1994, p. 3). Haller & Kleine summarized some key elements of qualitative methodology that are useful for orienting this investigation:

- Provide rich descriptions of the setting and context of the case
- Relate detailed accounts of persons and events in real-life situations
- Exercise in-depth examinations of social processes within particular contexts
- Offer researcher’s ethical values and personal viewpoints

The researcher took careful notes during the data collection and evaluation process to maximize the study’s validity and liability. Haller & Kleine’s framework for conducting case research summarized by these questions was used to inform the study design:

1. Does the researcher carefully outline the views and values which influenced his choice of sites studied and, even more importantly, his research findings and conclusions?
2. Are the assumptions of the research problem, explicitly clear and free of biases, giving a clear statement of the research problem, and the views and values beneath the research purpose?
3. Does the researcher provide a full and complete account of the study; offer a good description of the subjects, the setting, the amounts and types of data collected, and how the data is analyzed?
4. Does the researcher provide examples of the interview questions, the observation schedule, and the evidence regarding the amount of time spent on data collection?
5. How effectively and convincingly does the researcher accomplish the inference analytic process in answering ‘what is,’ ‘how,’ and ‘why’ questions? (Haller & Kleine, 2001, pp. 94-95).

To summarize, a mixed methodology approach prefered for this study because it allows the study to incorporate both qualitative and quantitative information to complement and support each other. According to the same rationale, a mixed method study design maximizes the validity of the research findings, and it also enables the researcher to access a wider range of information and experience. By merging both quantitative and qualitative data, the researcher is able to obtain a more comprehensive and deeper analysis of the research problem (Creswell, 2013; Creswell & Garrett, 2008, Creswell et al., 2003). In the present study, the mixed methodology began with a qualitative exploration of the research questions by conducting in-depth interviews with teachers, students, and parents, and then performed observations on focus groups, teachers’ common planning meetings, teachers’ instruction, class activities, intercepts of post-interview surveys, and comparison of non-participant and participant students’ grade performances. The qualitative data is used to explore quantitative findings. Conversely, quantitative results are interpreted in details through documented qualitative reports. A mixed methodology approach, therefore, is valuable because it allows the study to incorporate both qualitative and quantitative data while at the same time allowing the two sets of information to inform each other (Johnson & Onwuegbuzie, 2004).
3.3 Pilot Study Methodology

The main purpose of this pilot study was to assess students’ grade performance in the categories of reading and writing before and after the use of the Blended Learning Portal. The methodology used in the pilot research was to compare the New York State Assessment scores of the 9th graders at the beginning of the school year before the implementation of the blended learning portal and at the end of the year after students had been using the portal. New York State English Secondary Language Assessment Test (NYSESLAT) was used to assess a student’s English proficiency in four areas: Listening, Speaking, Reading, and Writing. For the purpose of this study, only the reading and writing performances were chosen for this research.

3.3.1 Pilot Study Results

The following table is a report of the participant students’ grade scores collected before students enrolled in the Literacy Program. A second set of grade scores was collected again at the end of the year for comparison. The rating scale for English Language Learners is classified as Beginner (691-795), Intermediate (796-826), Advanced 827-837), and Proficient (838-911). The following are the test scores of the English Class of Year 2012-2013 (Table 1).
Table 1: 1st Year and 2nd Year Performance Scores

<table>
<thead>
<tr>
<th>9th Grade</th>
<th>Test Scores September, 2012</th>
<th>Test Scores September, 2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>Student Initials</td>
<td>Level</td>
<td>Reading/ Writing</td>
</tr>
<tr>
<td>AG</td>
<td>B</td>
<td>691</td>
</tr>
<tr>
<td>JM</td>
<td>B</td>
<td>700</td>
</tr>
<tr>
<td>OP</td>
<td>I</td>
<td>820</td>
</tr>
<tr>
<td>AK</td>
<td>B</td>
<td>693</td>
</tr>
<tr>
<td>SC</td>
<td>B</td>
<td>704</td>
</tr>
<tr>
<td>AC</td>
<td>B</td>
<td>700</td>
</tr>
<tr>
<td>AF</td>
<td>I</td>
<td>823</td>
</tr>
<tr>
<td>HE</td>
<td>I</td>
<td>816</td>
</tr>
<tr>
<td>HQ</td>
<td>I</td>
<td>828</td>
</tr>
<tr>
<td>CT</td>
<td>B</td>
<td>790</td>
</tr>
<tr>
<td>RB</td>
<td>B</td>
<td>708</td>
</tr>
<tr>
<td>RC</td>
<td>I</td>
<td>804</td>
</tr>
<tr>
<td>MF</td>
<td>I</td>
<td>809</td>
</tr>
<tr>
<td>JD</td>
<td>I</td>
<td>810</td>
</tr>
<tr>
<td>MA</td>
<td>B</td>
<td>792</td>
</tr>
<tr>
<td>YM</td>
<td>B</td>
<td>723</td>
</tr>
<tr>
<td>AT</td>
<td>I</td>
<td>819</td>
</tr>
<tr>
<td>AV</td>
<td>B</td>
<td>710</td>
</tr>
<tr>
<td>JO</td>
<td>B</td>
<td>725</td>
</tr>
<tr>
<td>AR</td>
<td>B</td>
<td>755</td>
</tr>
</tbody>
</table>

The following Graphs compare the change of English proficiency level of each of the twenty students (Beginner, Intermediate, Advanced, and Proficient) who participated in the Literacy Program in terms of the number of students who achieved each proficiency level between Year 1 (2012) and Year 2 (2013). (Graph 1, Graph 2)
Graph 1: NYSESLAT Test Scores Results by Number of Students for Term 1 and Term 2 (N=20)

![Bar Chart](image1)

Graph 2: NYSESLAT Test Scores Results by Percentage of Students for Term 1 and Term 2 (2012-2013) (N=20)

![Bar Chart](image2)

Graph 1, and Graph 2 are students’ performance of the NYSESLAT Achievement tests for Year 2012 (Blue Bar), and Year 2013 (Red Bar) for Reading and Writing. These graphs indicate the
change of achievement in English language proficiency of participant students (Beginner, Intermediate, Advanced, and Proficient) in the Literacy Program from September 2012 to September 2013.

3.3.2 Pilot Study Data Analysis

The analysis process consists of comparing and evaluating whether there were grade performance changes between Term 1 (2012) and Term 2 (2013). The NYSESLAT Test of Year (2012) indicated that 60% of the students scored at Beginner Level and 40% scored at Intermediate Level and no students scored at Advanced or Proficiency Level. After one term, students were tested again in September 2013. Test scores showed that 9 out of 12 students or 75% were promoted from Beginner Level to higher English Proficiency Level indicating a 15% increase; Advanced Level gained from 0 students to 8 students, and Proficient Level gained from 0 students to 4 students.

3.3.3 Pilot Study Discussion and Conclusion

The research team attributed the English Proficiency Test score gains from year 2012 to year 2013 to the implementation of the literacy program using the blended learning portal. After the pilot study, the researcher took a survey with teachers, which indicated that most teachers were inclined to participate in a more thorough research on the same topic of literacy achievement. This time the study would be directed to focus on students’ learning across content subjects. The researcher selected a mixed methodology design of blended learning to gain a deeper knowledge of how blended instructions may affect pedagogy, learning, and student academic performance in four core subjects: English, Social Studies, Math, and Science. One significant indicator from the pilot study pointed out that teachers strongly believed the Literacy
program must be designed to integrate perfectly with the blended learning strategies in order to obtain optimal benefits for each student. In summary, the pilot case study conducted was instrumental in helping the researcher to work with teachers to establish a framework for conducting the main study in the following years. As Polit et al. (2001) described, a small-scale pilot study may obtain useful information in preparing the framework for the main study. The researcher and teachers agreed that one of the biggest challenges of content subject teaching was to help students develop “a sort of sophisticated literacy skills that a high school diploma ought to signify, such as the capacity to draw inferences from academic texts, synthesize information from various sources, follow complicated directions” (Hellen & Greenleaf, 2007, p. 1), and for students to apply the same literacy skills in studying the content subjects.

Another challenge the teachers faced was to choose the most effective instructional methodology to teach the literacy skills, to ensure that students can apply these skills to comprehending the content materials of a variety of subjects. The researcher believed that it is equally important to examine teachers’ opinions on the definition of content literacy instruction. As noted by Misulis (2009):

The task of connecting reading and writing skills to the demands of subject area instruction may present a challenge for students, and surely a daunting task for teachers. A more comprehensive understanding of content literacy instruction and familiarity with instructional strategies that are known to be effective could help teachers address issues of literacy learning across all subject areas for all grade levels and for all students. (p. 11)
3.4 Main Study: Using a Case Study Design

This research uses a case study design to investigate with an in-depth examination of a group of teachers and students who participated in a blended learning literacy program. The development of the blended learning model design evolved through several stages: Designing the integration of blended learning strategies and the literacy program, implementing the literacy blended learning model in the hybrid learning environment, and finally evaluating the effectiveness of the blended learning model. The examination of teachers’, students’, and parents’ responses to the interview and survey questions, observations of teachers’ instruction and students’ engagement in the learning process, evaluation of students’ academic performances are elements used to determine whether there is a relationship between the use of the blended learning literacy course site and the change of progress in the content area subjects. The following section illustrates the different stages of the blended learning literacy program development.

3.4.1 Participant Teachers’ Profile

In August 2013, one week before the start of the fall term of school year 2013-2014, the researcher organized a summer workshop and invited the program participant teachers to attend the workshop for the purpose of discussing implementation plans of this case study. All twelve blended learning teachers attended this five-day workshop. On the first day, the researcher administered a set of questionnaires to participant teachers. The survey was designed for teachers to self-report their demographic background and computer experience, and to assess their beliefs and interest regarding the use of the computer for teaching and learning. All twelve participant teachers are New York State certified licensed teachers holding a Master’s Degree in
their content subject. There are five male teachers and seven female teachers. The medium age of participant teachers in the blended learning program was in the 36-40 category. Teachers’ self-report survey reveals various levels of computer experiences in educational technologies. Only two out of the twelve teachers had a previous blended learning experience, however, everyone in the team was interested in transitioning into the blended learning instruction. The following two questionnaires surveys (Chart 1 and Chart 2) summarized the teachers’ demographic, computer knowledge, and academic data.
Chart 1: Participant Teacher Self-Reported Demographic and Academic Data (N=12)

<table>
<thead>
<tr>
<th>Variables</th>
<th>Frequency</th>
<th>Relative Frequency (%)</th>
<th>Cumulative Frequency (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>5</td>
<td>42</td>
<td>42</td>
</tr>
<tr>
<td>Female</td>
<td>7</td>
<td>58</td>
<td>100</td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>21-25</td>
<td>1</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>26-30</td>
<td>2</td>
<td>17</td>
<td>25</td>
</tr>
<tr>
<td>31-35</td>
<td>3</td>
<td>25</td>
<td>50</td>
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<tr>
<td>36-40</td>
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<td>33</td>
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<tr>
<td>50 or above</td>
<td>2</td>
<td>17</td>
<td>100</td>
</tr>
<tr>
<td>Ethnicity</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>African American</td>
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<td>0</td>
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<tr>
<td>Asian</td>
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<td>25</td>
</tr>
<tr>
<td>Hispanic/Latino</td>
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<td>25</td>
<td>25</td>
</tr>
<tr>
<td>White</td>
<td>6</td>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td>Licenses</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Content Certified</td>
<td>12</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Education</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Master</td>
<td>10</td>
<td>83</td>
<td>83</td>
</tr>
<tr>
<td>PhD</td>
<td>2</td>
<td>17</td>
<td>10</td>
</tr>
</tbody>
</table>
Chart 2: Participant Teacher Self-Reported Data on Computer Use

<table>
<thead>
<tr>
<th>Teacher Participant Self-Reported Computer Experience (N=12)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Variables</strong></td>
</tr>
<tr>
<td>---------------------</td>
</tr>
<tr>
<td><strong>Own a computer</strong></td>
</tr>
<tr>
<td>Yes</td>
</tr>
<tr>
<td>No</td>
</tr>
<tr>
<td><strong>Computer experience</strong></td>
</tr>
<tr>
<td>1-5 years</td>
</tr>
<tr>
<td>6 years or more</td>
</tr>
<tr>
<td><strong>Online experience</strong></td>
</tr>
<tr>
<td>Never</td>
</tr>
<tr>
<td>Several times a year</td>
</tr>
<tr>
<td>Several times a month</td>
</tr>
<tr>
<td>Several times a week</td>
</tr>
<tr>
<td>Daily</td>
</tr>
<tr>
<td><strong>Knowledge of blended learning</strong></td>
</tr>
<tr>
<td>None</td>
</tr>
<tr>
<td>Average</td>
</tr>
<tr>
<td>Very much</td>
</tr>
<tr>
<td><strong>Technology integration</strong></td>
</tr>
<tr>
<td>Low</td>
</tr>
<tr>
<td>Medium</td>
</tr>
<tr>
<td>High</td>
</tr>
<tr>
<td><strong>Blended experience</strong></td>
</tr>
<tr>
<td>None</td>
</tr>
<tr>
<td>1-2 year</td>
</tr>
<tr>
<td>3 years or more</td>
</tr>
<tr>
<td><strong>Interest in blended learning</strong></td>
</tr>
<tr>
<td>Low</td>
</tr>
<tr>
<td>Medium</td>
</tr>
<tr>
<td>High</td>
</tr>
</tbody>
</table>
3.4.2 Participant Students’ Profile

The case study included 77 participant students. The students’ age range is between 15 to 18 years old from grade 10 to 12. The 77 students of the blended learning classes are compared with the 77 students in the non-blended learning classes in four content subjects in terms of grade performance over two semesters. Each grade level in the blended learning has approximately the same number of students as the non-blended learning subject classes. Blended learners travel to the computer room ten minutes before class begins. The non-blended learning students are not assigned to a fixed schedule at the computer laboratory. On the first day of the school term, the researcher visited the blended learning classes, explained the literacy program to the students, and confirmed with the students that they were invited to voluntarily participate in the Literacy program. The invitation had been sent to the parents six months earlier in May. The parents’ Invitation letter is found in Appendix A. The researcher explained that students still have the choice of opting-out of the program within a week if they wish. After a week when program changes ended, two students opted out of the program and enrolled into the non-blended program. Seventy-seven students remained in the literacy program.

In order to ensure that the teacher-designed blended learning literacy program fits the needs of students, the researcher designed the first questionnaires to assess students’ computer ability in terms of years of experience, frequency of use, purpose for use, computer ownership, and to rate their interest as “low,” “medium,” or “high.” The students were not required to participate in the questionnaire, however, they all participated.
Chart 3: Participant Student Self-Reported Demographic and Academic Data

The number of BL participant students was seventy-seven. (N=77)

<table>
<thead>
<tr>
<th>Variables</th>
<th>Frequency (%)</th>
<th>Relative Frequency (%)</th>
<th>Cumulative Frequency (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>37</td>
<td>48</td>
<td>48</td>
</tr>
<tr>
<td>Female</td>
<td>40</td>
<td>52</td>
<td>100</td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14-15</td>
<td>23</td>
<td>30</td>
<td>30</td>
</tr>
<tr>
<td>16-17</td>
<td>24</td>
<td>31</td>
<td>61</td>
</tr>
<tr>
<td>18-19</td>
<td>30</td>
<td>39</td>
<td>100</td>
</tr>
<tr>
<td>Ethnicity</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>African American</td>
<td>11</td>
<td>14</td>
<td>14</td>
</tr>
<tr>
<td>American Indian</td>
<td>0</td>
<td>0</td>
<td>14</td>
</tr>
<tr>
<td>Asian</td>
<td>15</td>
<td>19</td>
<td>33</td>
</tr>
<tr>
<td>Hispanic</td>
<td>22</td>
<td>29</td>
<td>62</td>
</tr>
<tr>
<td>White</td>
<td>23</td>
<td>30</td>
<td>92</td>
</tr>
<tr>
<td>Other</td>
<td>6</td>
<td>8</td>
<td>100</td>
</tr>
<tr>
<td>Academic Standing</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sophomore (10th)</td>
<td>23</td>
<td>30</td>
<td>30</td>
</tr>
<tr>
<td>Junior (11th)</td>
<td>24</td>
<td>31</td>
<td>61</td>
</tr>
<tr>
<td>Senior (12th)</td>
<td>30</td>
<td>39</td>
<td>100</td>
</tr>
<tr>
<td>First Language (English)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>56</td>
<td>73</td>
<td>73</td>
</tr>
<tr>
<td>No</td>
<td>21</td>
<td>27</td>
<td>100</td>
</tr>
</tbody>
</table>

The first set of student questionnaires (Chart 3) was distributed to students at the end of the first week of the term. The purpose of the second set of questionnaires was to allow students to self-report on the amount of time spent on computer and the degree of their interest. The following is participant students’ self-reported data on computer use and interest. (Chart 4)
Chart 4: Participant Student Self-Reported Data on Computer Use and Interest

<table>
<thead>
<tr>
<th>Variables</th>
<th>Frequency (%)</th>
<th>Relative Frequency (%)</th>
<th>Cumulative Frequency (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Computer Skills</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>4</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Average</td>
<td>63</td>
<td>82</td>
<td>87</td>
</tr>
<tr>
<td>High</td>
<td>10</td>
<td>13</td>
<td>100</td>
</tr>
<tr>
<td><strong>Participated in blended learning</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>First time</td>
<td>72</td>
<td>94</td>
<td>94</td>
</tr>
<tr>
<td>1-2 year</td>
<td>5</td>
<td>6</td>
<td>100</td>
</tr>
<tr>
<td>3 year or more</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>Access to Internet</strong> (Computer, I-Pad, I-Phone)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>75</td>
<td>97</td>
<td>97</td>
</tr>
<tr>
<td>No</td>
<td>2</td>
<td>3</td>
<td>100</td>
</tr>
<tr>
<td><strong>Interest in blended learning</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>3</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Medium</td>
<td>11</td>
<td>14</td>
<td>18</td>
</tr>
<tr>
<td>High</td>
<td>56</td>
<td>73</td>
<td>91</td>
</tr>
<tr>
<td>Extremely high</td>
<td>7</td>
<td>9</td>
<td>100</td>
</tr>
<tr>
<td><strong>Online experiences</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>3</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>No</td>
<td>74</td>
<td>96</td>
<td>100</td>
</tr>
<tr>
<td><strong>Blended learning course interest</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Medium</td>
<td>3</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Neutral</td>
<td>5</td>
<td>6</td>
<td>10</td>
</tr>
<tr>
<td>High</td>
<td>49</td>
<td>64</td>
<td>74</td>
</tr>
<tr>
<td>Very high</td>
<td>20</td>
<td>26</td>
<td>100</td>
</tr>
</tbody>
</table>

The survey indicates that only 3 students had some blended learning experience, 74 out of 77 students are interested in trying out the blended learning course, and 69 out of 77 strongly anticipate that blended learning will support their literacy progress. The self-reported surveys
revealed the participant teachers’ and students’ levels of computer experiences and technology knowledge at this early stage.

### 3.5 The Designing of the Blended Learning Literacy Course Site

The principles outlined in the literature review section on the beneficial features of the blended learning literacy model with respect to the blended learning environment, the literacy digital curriculum, and the particular instructional strategies in the blended learning components were taken into consideration in the designing of the educational portal for both teachers and students (Ref. Sections 2.7 and 2.8). The teachers decided that the new blended design should be a flexible model, capable of combining different features of the six blended models defined by Staker (2011): (1) Face-to-face (2) Rotation (3) Flex (4) Online lab (5) Self-blend (6) Online driver (Ref. Section 2.6, and 2.8.1).

According to the literature review (Ref. Section 2.10), it is important to take into consideration teachers’ opinions during the model designing process (Keshta & Harb, 2013; Larsen, 2012; Napier, Dekhane, & Smith, 2011). To this end, the researcher prepared the following theme-focused, open-ended questions to be used for the teachers’ first interview with the objective of acquiring a more insightful knowledge of teachers’ general perceptions of literacy, and their beliefs about the need to improve content literacy using the blended learning technology tools. There were 12 teachers in this case study. The researcher was able to ask the same questions and have a conversation with every teacher.
3.5.1 Teachers’ First Interview

The following open-ended questions were used to find out teachers’ opinions regarding the incorporation of the blended learning literacy program. The researcher met with the literacy coach to prepare a set of questions to be used for this interview. These four overarching questions were revised two times before they were used for the interview. The teachers’ first interview questions were the following:

Question 1: Why do you think that literacy is important to students in all subjects?

Question 2: Why do you think reading with fluency is important for learning content subjects?

Question 3: Do you believe that blended learning can be useful for supporting literacy achievement, and improvement in content learning?

Question 4: Are you in favor of using blended learning instruction for improving fluency and comprehension in content readings?

After reviewing the first interview findings, the researcher worked with teachers on designing the rotational stations in the blended Classroom.

3.5.2 The Rotational Learning Stations in the Blended Classroom

In the rotational station, every student is required to learn the fundamental concepts of each lesson by participating in the face-to-face Mini-lesson directed by the instructors for 45 minutes. The physical contact of face-to-face learning has the advantage of allowing teachers and students to see, listen, and deal with each other in a personal manner. As Fahlvik (2014) phrased it, the physical classroom allows teachers to respond immediately to students’ needs, and
therefore are to re-align learning goals whenever the situation requires (Para 2). After the face-to-face daily Mini-lesson, students have the option of extending the class activities and reinforce what they had been learning in the class in one of the three stations: the online, flex, or self-blend station according to a pre-arranged study plan that the student organized collaboratively with the instructor. Students who had already mastered the class materials during the Mini-lesson session can continue reviewing the same lesson through the online curriculum on their own in the Online Station, or continue to the Flex or Self-Blend Station. Accelerated or advanced students can head start in the next lesson in advance preparation for the following day’s class, login to a supplementary online course, or engage in an online research project. In all of these e-learning stations, students are given the chance to exercise personal responsibility by taking up their self-regulated initiatives (Ref. 2.9.3). In this blended learning model, learning is integrated in the face-to-face and online driver. (Figure 2)
In this blended learning model design, the teachers play a key role in directing the students’ learning as learners progress in their studies from one phase to another in the various blended learning stations demonstrated in Figure 2.

Many teachers suggested in the interviews that the ‘flipped classroom’ is one of the best techniques for integrating technology and digital learning into the class lesson. (Ref. 2.6, 2.9.1). The teachers make use of the ‘flipped classroom’ to allow students to learn new content before class and after class by watching a Webinar, a video lecture, or any teacher-assigned activity.
online using their own time outside of the classroom. As many teachers pointed out, when students are watching the videos or lectures alone without interruptions, they can be more focused on what they are watching, and they can replay the activity as many times as they need to learn the content well (Hamden, Mcknight, & Arfstrom, 2013). Participant teachers worked collaboratively in sharing videos or digital lessons among each other, thus allowing students to have access to different teaching styles to enhance their comprehension of content materials.

3.5.3 The Flipped Classroom Learning Strategy

During the face-to-face class session, teachers pre-assigned reading assignments to prepare students before they come to class. After the class lesson, teachers provide recommendations of additional readings and exercises and may also suggest additional learning opportunities, such as independent study projects organized by the subject departments, and online course participation with college courses as part of students’ extra-curricular activities. The following figure (Figure 3) illustrates the teachers’ perception of students’ learning process, and how they can help students develop literacy proficiency using the ‘flipped classroom’ strategy before class, during class, and after class.
Similar to this 3-phase learning model are the three approaches to strategic reading introduced by Nuttall (1982), who describes three major supporting strategies for guiding students in reading content texts that contain more complex embedded sentence structures. First, “Guidance can be given to students before reading the text” such as providing a rationale for reading, breaking up the text into smaller pieces, and asking signpost questions about the text (Nuttall, 1982, p. 152). This reading strategy can be integrated into the ‘flipped classroom’ strategy by the ‘before class’ assignment where teachers design general inquiry type of questions to orient students to obtain an overview of the reading assignment. Second, “Guidance while reading is underway” where the author distinguishes various types of instruction based on the whole-class approach, individualized learning approach, and group learning approaches (Nuttall, 1982, p. 159). When teachers conduct instruction in-class, specific questions can be directed to frame brainstorming ideas in discussions, or time can be set aside to provide the person-to-
person instruction to ensure that everyone grasps the content materials fully. Third, “Guidance when reading has been completed,” which according to Nuttall, is the opportune moment for students to self-assess their own understanding of the text, “Now is the time to reconsider the hypotheses that the students made about the text in the early stages” and to assess students’ “opinions about the writer’s aims, about the main message of the text, etc.” (Nuttall, 1982, p. 164). Aligned with the concept of the ‘flipped classroom,’ teachers prepare links of different areas of interests for students to continue their inquiries through self-directed activities or projects. In other words, the kind of questions teachers ask students are different at various moments of the learning process, that is, before reading the text, while reading the text, and after reading the text. In the blended learning situation, the teachers can revise instruction and learning materials in such a way that they formulate the types of questions appropriate to each learning engagement such as before class (pre-reading assignments) via the digital notes, in-class through direct-instruction, and after class through recommendable online programs, courses, or web resources.

3.5.4 Integration of Bloom’s Cognitive Skills in the Classroom (Ref. 1.1, 2.6)

Teachers can strategically organize the learning materials in such a way that students gain a preliminary understanding of the lesson of the day before class begins. For example, having students google the definitions and learn the meanings of some key terms before coming to class is an effective way to advance the process of learning, and allowing teachers to spend more time on developing the thinking skills of analysis, application, and evaluation during class. After class, some students will continue the learning process through self-initiated projects in the computer lab or at home. (Figure 3, 4)
Figure 4: Bloom’s Stages of Cognitive Learning Before, During, and After Class

The above (Figure 4) illustrates how the teacher uses blended learning strategies to develop students’ cognitive thinking skills in the blended classroom, which are parallel to Bloom’s hierarchy of cognitive thinking skills.

3.6 Development of the Blended Learning Literacy Content

In the first meeting, every member of the research team voted on the most approiprable Performance Standards for English Language Arts (ELA) as a framework for preparing the curriculum and instruction materials. The team members reviewed the New York State ELA performance standards as well as several other states’ performance standards across the country. Every teacher agreed on the following New York State Performance Standards to be
used as the benchmark for literacy achievement in relation to reading and comprehension of content texts:

Standard I: Language for information and understanding

Standard II: Language for literary response and expression

Standard III: Language for critical analysis and evaluation

Standard IV: Language for social interaction

Furthermore, the team reviewed the State Content and Student Performance Standards Setting Process from *Improving America’s School* (1995). This article described the standards setting process to include three components:

1. Academic content standards that reflect the ideas, skills, and knowledge in each discipline that is important enough for everyone to learn.
2. Performance standards (sometimes called indicators), which define “excellence” and how good is “good enough.”
3. Proficiency levels that assign values to examples of student work expected at certain developmental levels (Riley, 1995).

In order to capitalize on the New York State Learning Standards established for English Language Arts, the team set forth these directives, which cover four broad areas of concerns. Teachers should:

1. Focus on students’ learning with technology and not on simply using technology.
2. Emphasize on how teachers use effective strategies to teach content materials.
3. Give importance to student motivation and engagement.
4. Pay attention to teacher and student training in the use of new technologies and software.

Means (2010) suggested that: “Technology implementation practices need to be investigated in conjunction with studies of technology effects on student learning” (p. 288).

The second agenda that came up in a series of Teachers’ Common Planning (TCP) meetings highlighted several key points related to the development of the digital curriculum. Participant teachers shared the common belief that a very important component of the blended learning literacy course is the effective use of the hyper-linked digital curriculum that allows instruction to extend students’ learning opportunities beyond the resources provided by the basic curriculum.

The third agenda was the designing of a specific rubric for reading comprehension for each subject. Teachers of each department designed their own rubric that corresponded to each content subject’s digital curriculum. This rubric was intended to serve as a guide to improve reading literacy across content subjects. The teachers agreed that the use of rubrics offers them a tool for assessing and evaluating students’ work objectively and effectively. The general consensus was that rubrics are extremely useful for students to improve, self-evaluate, and self-correct their own work. At the same time, rubrics help teachers to justify the grades given to each student. The use of rubrics to guide students’ learning has gained more attention in recent years in the research field (Panadero & Johnson, 2013). In Carnegie Mellon University’s website, a specific section is devoted to the advantages of using rubrics in instructional classrooms. From the instructor’s point of view, rubrics help instructors obtain a clearer picture of the strengths and weaknesses of their students. The advantage of rubrics is described succinctly as follows:
A rubric can help instructors communicate to students the specific requirements and acceptable performance standards of an assignment. When rubrics are given to students with the assignment description, they can help students monitor and assess their progress as they work toward clearly indicated goals. When assignments are scored and returned with the rubric, students can more easily recognize the strengths and weaknesses of their work and direct their efforts accordingly.

http://www.cmu.edu/teaching/designteach/teach/rubrics.html. (Para 3)

Similarly, to the concept of using rubrics for assessing students’ work was the 3-3-3- and 3-year-round-3 stages assessment tool designed by (Khan, Khalsa, Klose, & Cooksey, 2011) to evaluate five university students’ performance at the beginning, mid-program, and end of the year over a period of 3 years in 3 rounds on participant students’ ability in communication, critical thinking, information literacy, technology fluency, and content knowledge at the graduate level. The study’s findings indicated that using this rubric had an effective impact on students’ achievement progress.

The benefit of good rubrics serving as a powerful informative feedback that supports learning and the development of critical thinking skills was again testified to by Andrade (2000 pp. 13-18). When choosing instructional rubrics for guiding teaching, every teacher in the research team voted for using Bloom’s Revised Taxonomy as the general rubric to guide the students’ development of cognitive comprehension skills necessary for all content subjects. Furthermore, the subject teachers were inclined to use Bloom’s Taxonomy rubrics to implement the scaffolding strategies. Consequently, the new version of Bloom’s Taxonomy was chosen as a
reference for designing the learning rubric, which was then posted on the sidewall in the face-to-face and online classrooms to indicate teachers’ expectations of the quality of the students’ performance task. For the Literacy Program, the English teachers went further to design a specific rubric for English Literacy Performance and Reading Comprehension. This rubric would serve as a guide to improve reading literacy across content subjects. The comprehensive rubric is found in (Appendix C). This rubric has four-rating criteria: Main idea, critical thinking, connections, and vocabulary based on a scale of 1-4 as described here.

**Main idea:** Identification of main idea with supporting details is rated according to these four criteria: (4 = Successful and extensive, 3 = Successful and Considerable, 2 = Acceptable, and 1 = Unsuccessful)

**Critical Thinking:** Understanding and applying concrete and abstract ideas is rated as (4 = Commendable, 3 = Effective, 2 = Suitable, and 1 = Limited)

**Connections:** Connections both within the text and to previous knowledge is rated as (4 = Exceptional, 3 = effective, 2 = Suitable, and 1 = Minimal)

**Vocabulary:** Demonstration of understanding of words in a given context is rated as (4 = Commendable, 3 = Effective, 2 = Suitable, and 1 = Limited)

The teachers used another rubric to evaluate the essential components of the student’s reading comprehension ability (Appendix D). Another purpose of using a standardized rubric is to facilitate teachers’ discussions on students’ work and performance progress during the Teachers’ Common Planning meetings.
3.7 The Blended Learning Environment

Teachers perceived two learning roadmaps in the blended learning model: The face-to-face classroom and self-directed online learning. In the face-to-face classroom, teachers conceived that direct teaching involves supporting students’ understanding through six facets. Students learn how to explain, interpret, apply, empathize, and have perspective and self-knowledge in the learning processes (Wiggins & McTighe, 1998, 2005). The researcher observed that many students, especially younger students, are in favor of teachers’ active, live presence in their learning experiences. Sheridan & Kelly (2010), Richardson & Swan (2003) are representatives of the view that the teachers’ presence can give students clear instruction on course topics, provide direction and answers to students’ questions, and monitor directly student motivation and engagement in classroom tasks. Equally supportive of this perspective is found in the work of Anderson, Rourke, Garrison, & Archer (2001) where the authors believed that the teacher’s live presence in the virtual environment of online courses seemed crucial to student engagement and authentic learning.

The blended learning environment is very much influenced by the teacher’s leadership quality. According to Anderson et al (2001), teachers play various roles in the blended classroom that contribute to a quality learning experience.

First, as designer of the education experience, including planning and administering instruction as well as evaluating and certifying competence; second, as facilitator and co-creator of a social environment conducive to active and successful learning; and finally, as
a subject matter expert who knows a great deal more than most learners, and is thus in a
position to ‘scaffold’ learning experiences by direct instruction. (p. 2)

Some teachers held the opinion that it requires more effort to integrate an interesting
and motivating online instruction into a face-to-face classroom. Unlike the face-to-face
environment, in which physical and personal communication are parts of the natural process of
interaction, the online environment presents a different and higher level of difficulties and
challenges in course designing. Instructors must ensure that when students are working alone, all
the supports are available for them. For this reason, many teachers claimed that their
instructional responsibilities involved not only teaching but also coaching to address students’
various needs in an online learning situation. The following model (Figure 5) is a visual
presentation of how teachers conceived their instructional roles in the blended environment.
3.7.1 Teachers’ Dual Roles in Blended Learning (Figure 5)

Figure 5: Teachers’ Dual Instructional Roles in Blended Learning

The next model design represents teachers’ conceptual framework of the distribution of technology resources through different instructional channels within the various components of the blended learning model.
3.7.2 Technology Supported Components in the Blended Classroom (Figure 6)

One of a series of Teacher Common Planning meetings was held for textbook review just one week before school began. The researcher reviewed the Math and Science textbooks with the Math and Science teachers, while the Literacy Coach assisted the English and Social Studies teachers. The digital curriculum was planned and instructional syllabus was prepared for the entire school year for each subject. The intention of the members of the team was to choose textbooks that would adequately reflect the performance standards and the directives the teachers chose for each subject course. The team spent numerous hours studying the online textbooks’ content materials published by different textbook publishers. At the end of the
textbook reviewing session, each department purchased the online curriculum package license needed for their subject course.

3.7.3 The Online Digital Course Site

Even though contemporary online textbooks are enriched with well-designed teaching and learning materials including useful hypertext and online web links, teachers still have the tasks of organizing and adopting them into their own designed digital curriculum in each blended learning environment according to students’ needs. Teachers saw the necessity of enhancing the course curriculum by creating additional links such as Videos lectures, YouTube, Web-links, Webinars, Work Cast, etc., besides what the textbooks already contained (Boulos et al., 2006). For this reason, the teacher’s Common Planning Committee was initiated for the purpose of meeting weekly to discuss lesson organization, student work, and best technology practices for both face-to-face and online instruction. In one of the meetings, the researcher advised the teachers to develop six key instructional strategies for improving reading comprehension directed to support students’ content area learning.

The following reading comprehension learning strategies were adopted in the blended classroom based on Harvey & Goudvis’ (2000) recommendations.

(1) Make Connections: A bridge from the known to the new.

(2) Questioning Techniques: The strategy that propels readers forward.

(3) Visualizing and Inferring: Strategies that enhance understanding.

(4) Determining Importance in Text: The non-fiction connection.

(5) Synthesizing Information: The evolution of thought. (pp. 7-10)
As Palincsar et al (1991), “The goal of the literacy instruction is to teach reading and writing as tools to facilitate thinking and reasoning in a broad array of literacy event” (p. 43). In the humanities courses teachers focused more on the analysis, synthesis, and evaluation skills to develop students’ ability to pinpoint the controlling ideas and formulate new meanings based on the particular themes presented in the text, and to make judgments about them according to the set of standards or rubrics. In the non-humanities subjects, such as math and science, teachers believed that comprehension and application skills learned from the literacy class are particularly essential for solving Math and Science problems (Ref. 2.2). Their claim is that students must understand well the literacy information presented in order to analyze and solve verbal problems found in math or science textbooks (Ref. 2.12). To this effect, the online digital curriculum was designed to incorporate the six learning strategies into the daily learning lessons’ database, which both teachers and students are able to access online and offline anywhere and anytime at one’s convenience.

The theoretical framework for the digital course site design is rooted in the constructivism model of learning. Perkin (1999, p. 7) identified three distinct roles that pertained to students’ learning and engagement in the constructive model: “We’ll call them the active learner, the social learner, and the creative learner.” The digital course site has a place for teachers:

1. To post the goals and objectives for each lesson.
2. To make available plenty of online practices and activities, which are intended to inspire students to active engagement.
3. To include online feedback technology tools to help students gauge their day-to-day performance.
(4) To assign tutorial supports with real time and virtual coaching tools to help students develop interests to amplify inquiry.

To put it in a nutshell, the educational site contains the major elements of a constructive learning environment that supports effective instruction while inspiring students to become active, social, and creative learners (Ref. 2.12.1). The teachers use this course portal daily to perform all kinds of instructional functions: Teachers communicate to and share with the students the course outline and syllabus, as well as any course announcements such as required readings, class projects, homework assignments, grading rubrics, and grade reports etc. The teachers’ online portal is equipped with interactive tools that facilitate teaching and instructional delivery while the students’ online portal has all the academic supports for students to learn, study, and self-assess their own learning and performance progress. For the instructors, the digital curriculum site is designed to contain interactive instructional tools, chapter problems, teachers’ edition solutions menu, and examination generator for different grade levels (Ref. 2.9.1). For the students, there are unit and chapter test practices for students to self-assess their learning progress, as well as real time online performance examinations (Ref. 2.9.2, 2.9.3).
3.7.4 Teachers’ Online Digital Course Portal (Figure 7)

Figure 7: The Instructor’s Digital Online Course Website

Each menu of this webpage is further explained in the following notes:

1. **Teacher’s Homepage**: This page contains the description of the subject course and course objectives, teacher’s email address and links to teachers assigned video lectures, and daily announcements.

2. **The Instructor’s Edition of the Digital Curriculum**: The teacher’s resources contain useful teaching references, helpful suggestions, and ready solutions for each chapter and unit.
3. **Instructor’s Resource CD** supplemented with:
   - Lesson plan suggestions
   - PowerPoint slides for each lesson
   - Workbook applications and answers

4. **Exam-Views Computerized Test Generator**: These standardized assessment quizzes and tests are aligned with each unit and chapter. They save Instructors’ time in creating effective exams for assessing students’ understanding of the concepts contained in each chapter. Teachers use the exam templates to edit, add, delete, or modify questions according to their needs.

5. **Interactive Smart Board Presentation CD**: The Interactive CD of each unit, already aligned with white board presentation, saves teacher preparation time and enhances classroom instruction. The CD also contains a section of Checking for Understanding – This section allows students to immediately practice the concept on their own during Online Laboratory time.

6. **Strategies for Guided Practice CD**: The Guided Practice CD includes review work sheets and multi-level applications for key concept exercises.

7. **Solution Manual**: The solutions manual provides teacher with answers for each chapter’s applications. The solutions’ manual web link is available for students’ view in the Course Site.

8. **Ongoing Assessments**: This section generates ready prepared examination questions based on the content materials of each unit and chapter.
9. **End Term Examinations:** The Teacher’s Manual contains several types of Assessment tools available for teachers to use as guidelines to create their own tests.

### 3.7.5 Designing the Class Lesson Template

The third agenda discussed in the Teachers Common Planning meetings was the designing of a class lesson template as part of the teachers’ digital curriculum to be used for instruction in all subject classes (Hogan, 2013). Each subject teacher would upload their lessons to the portal where students can access them online during class or at home. At the beginning of the term, teachers agreed to design a daily class lesson template to serve as a roadmap for both teachers and students. “A lesson plan is the instructor’s road map of what students need to learn, and how it will be done effectively during the class time” (Milkova, 2012, pp. 1-6). It was suggested that every subject teacher would use a similar template for lesson development and instructional delivery so that students have a sense of consistency as they move from one class to another and from the face-to-face to the online experience. Jensen (2005) described the importance of planning lessons in these words: “A lesson plan is an extremely useful tool that serves as a combination guide, resource, and historical document reflecting our teaching philosophy, student population, textbooks, and most importantly our goals for our students” (2005, p. 403). The same author explains that a lesson has three stages of development, “a beginning,” “a middle,” and “an end” (pp. 404 - 413). Exploring the key ideas in several articles related to lesson planning, the team of teachers designed a lesson template similar to suggestions by Milkova (2012), which involved six preparation steps:
1. Outline learning objectives
2. Develop the introduction
3. Plan the specific learning activities (the main body of the lesson)
4. Plan for students’ understanding
5. Develop a conclusion
6. Create a realistic timeline.

The instruction template has five main categories.

1. Heading: Name of the teacher, subject class, and date of the lesson
2. Aim of the lesson
3. Goals/Objectives
4. Materials needed for the lesson
5. Warm Up activities
6. Mini-lesson of the day
7. The teacher models applications
8. The student works with guided practice
9. Summarize lesson with some form of informal assessment
10. Explain instruction regarding assignments and reference resources to facilitate students’ transition to the online class

Teachers also made use of the following recommendation: “To write brief comments on a lesson plan that helps with the transition from one activity to another is useful; to note the
number of minutes allotted for each activity in the margin of the lesson plan is important, and to consider the seating arrangements for various activities in the lesson plan” (Jensen, 2005, p. 410). The lesson plan template for each of the four subject classes is displayed in Chart 5.
### 3.7.5.1 Daily Lesson Outline for Class Instruction (Chart 5)

**Chart 5: Daily Lesson Outline for Class Instruction**

<table>
<thead>
<tr>
<th>Daily Lesson Agenda</th>
<th>Name of Teacher:</th>
<th>Date:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Subject Class:</td>
<td></td>
</tr>
<tr>
<td>Topic from chapter unit</td>
<td>Aim or Objective of the Day tells the student what the lesson will be about.</td>
<td></td>
</tr>
<tr>
<td>Warm Up</td>
<td>The teacher posts a brief assignment that can be done as a group or done independently. The Warm Up can be a brief reading, writing, or a problem-solving activity to help students to get ready for the lesson of the day. The purpose of the Warm-Up is to provide continuity from previous lessons and to facilitate connection of learned materials to the current lesson. (The student does the class online assignment at home or before coming to class). The spiraling reviews serve the function of motivating students to tap into their prior knowledge to explore new ideas presented by the teacher.</td>
<td></td>
</tr>
<tr>
<td>Mini-Lesson of the day</td>
<td>The Mini-Lesson in the Face-To-Face (FTF) classroom is direct instruction where teacher explicitly presents the lesson’s concepts to the students. This is the concept development moment where teachers open the minds to the learning objective of the day’s lesson. The teacher conducts instruction in one of these ways depending on the content subject: ◊ Conduct a shared reading demonstrating a reading strategy or skill ◊ Demonstrate a writing strategy ◊ Read and think aloud for a specific purpose ◊ Teach a key concept modeling a set of procedures or steps ◊ Coach students in a hands-activity ◊ Make real-world connections to the day’s lesson</td>
<td></td>
</tr>
</tbody>
</table>

Part of the mini-lesson instruction is the modeling process where the teacher
demonstrates the skills necessary to achieve learning.

| Guided Practice | The teacher, through direct instruction, guides students on how to apply the skills taught in concrete situations. This session includes instructing, orienting, and in some cases, modeling the procedures or steps that a problem uses to arrive at a solution or an answer. When students understand well the teacher's direct instruction in the class, then he/she will feel the confidence to perform the tasks independently during the online practices. Guided practice is an important learning link between FTF and Online experiences. |
| Summarize the lesson | Summarizing the class lesson at the end of the mini-lesson is important for any content subject learning. A good summary helps students in these ways: |
| | 1. To determine the main ideas of the lesson. |
| | 2. To identify essential ideas or concepts and to gather crucial details that support the ideas. |
| | 3. To focus on necessary information from irrelevant information. |
| | 4. To enable students to reduce a large piece of text to the several main points for concise understanding. |
| Facilitating students from FTF classroom to the OL Course Site | In the blended environment, some elements of instruction are taught in the classroom while certain parts are continued through online delivery. Teachers need to organize and deliver a well-integrated lesson plan in which students can effectively transmit from the Web-Enhanced instruction classroom to a learning environment where the content, assignments and interaction are delivered and organized through the Internet. The Course Site content allows teachers to use the digital curriculum, tutorial services, and rich reference materials to increase students’ learning time and additional engaging experience. |
| Checking for Understanding through informal and formal assessments | In the blended environment, teachers have two ways to assess a student’s achievement: via FTF and OL work. Most teachers will be using the 50% FTF and 50% OL formula. Grading Scale: Classroom work = 25 pts. (Warm Up exercises, class-work such as reading and essay tasks, problem-solving) |
3.7.5.2 Demo of a 12th Grade English Class Lesson Plan

Each subject teacher would post their class lessons online daily making them available for students to plan their study before coming to class. All lessons are posted online until the end of the term. By clicking on the database which contains every subject’s class lesson, the students are able to review the daily lesson in every subject. An online example is shown in (Chart 6).
### Chart 6: The Instructor’s Class Lesson (12th grade English Class)

<table>
<thead>
<tr>
<th>Teacher:</th>
<th>Subject Class: 12th Grade English</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-Class Assignment:</td>
<td>The teacher opens the lesson of the day from the online digital course curriculum using the classroom’s computer screen.</td>
</tr>
<tr>
<td>1. Visit the site and pull out the passage from [<a href="http://www.nysedregents.org/comprehensive">http://www.nysedregents.org/comprehensive</a> English/Archive/2003061919exam2.pdf](<a href="http://www.nysedregents.org/comprehensive">http://www.nysedregents.org/comprehensive</a> English/Archive/2003061919exam2.pdf)</td>
<td>Aim: Read passages from previous English Examination Regents: “Unforgettable Miss Bessie”</td>
</tr>
<tr>
<td>a. Reference to page 8: “Write a critical essay in which you discuss two works of literature you have read from the particular perspective of the statement that is provided for you in the Critical Lens. In your essay, provide a valid interpretation of the statement, agree or disagree with the statement as you have interpreted it.</td>
<td>Part 1: What lessons from childhood does the protagonist in “Unforgettable Miss Bessie” reveal? A. In your opinion, do you think Miss Bessie was a good teacher? Explain your answer and support it with evidence from the selection. B. Why did Miss Bessie believe that education is the first step in accomplishing lesson dreams?</td>
</tr>
<tr>
<td>b. Support your opinion using specific references to appropriate literary elements from the reading.”</td>
<td>Part II: How do we interpret the critical lens statement on Part B?</td>
</tr>
<tr>
<td>c. Post your work in the E-Board discussion thread.</td>
<td><strong>Warm up activity:</strong> The instructor goes over the E-Board discussion threads of the students.</td>
</tr>
</tbody>
</table>

### In-Class Instruction (about 20 minutes)

The teacher asks students to discuss the “Critical Lens” of this passage on page 7, part B of the Regents.

> “Good people...are good because they’ve come to wisdom through failure.” William Saroyan as quoted in “Room for Hate – and Hope” from New York Journal-American, August 23, 1961.

### Mini-Lesson of the Day:

The teacher asks one of the volunteers to read aloud the critical lens. The teacher guides the class activity through a Socratic discussion around the concept of “Critical Lens”.

The teacher helps students to find the “controlling idea” of the passage, and suggests that reading the passage carefully is important to understanding the main theme of the reading. Students are recommended to use the online dictionary via their I-Pad throughout the class session to look up every unfamiliar word. The whole class participates in the Mini-lesson of
the day for about 20 minutes. Afterward, the student may partner with a friend, join a group for group work, or perform individualized activities.

**In-Class Guided Practice**

Students were divided into several groups. The computer station has six computers available for students to work online. Another station is the viewing center, which has the teacher’s YouTube videos. These videos contained the instructor’s daily lesson installed in every computer. Students may choose to review previously taught lessons or advance to the new lesson whenever they are ready. While students are writing the critical essay online, the teacher acts as a coach walking around to offer support to whoever needs help.

The teacher explains the definition of the quotation and paraphrasing the “Critical Lens”.

The teacher guides students how to write a critical essay according to these instructions:
1. Read/understand the critical lens
2. Interpret the meaning of the passage
3. Show agree/disagree with different points
4. Explain why you agree/disagree
5. Support one’s view and opinion using two works of literature

**In-Class: Summary of the Lesson**

Teacher summarizes the lesson with a handout of another article: “God sees the truth but waits?” by Leo Tolstoy published in 1872. Teacher describes the article and relates it to the concepts students just learned from the day’s lesson. The focus point is dealing with how the protagonist of this story deals with justice and fate.

**After-Class: Students work independently and post their work online to be critiqued by classmates.**

Assignment for next lesson consists of a set of questions about Leo Tolstoy’s article. Students are to post their answers in the E-Board and must comment on at least two classmates’ responses.

---

### 3.7.6 Students’ Online Digital Course Portal

The students’ digital course curriculum within the course portal lays out a program of studies for each course subject indicating what it takes for each student to acquire the knowledge and literacy skills to read content materials. The curriculum is organized to provide in-
class and off-class opportunities of deep engagement in a wide range of high quality content literacy activities building towards the development of skills in reading content materials. (Ref. 2.9.2)

3.7.6.1 Online Digital Curriculum

The student digital curriculum provides students with a variety of educational and learning pathways:

1. E-Board Center
2. Course Navigation Roadmap and Instruction
3. Academic Resources
4. Class Activity Center
5. E-Library
6. Web Resources
7. Media Center
8. Progress Monitoring Center
9. Parents’ Center

The following (Figure 8) describes the students’ Online Digital Course Portal which has nine sections of student services.
**Student View: Class Tools Virtual**

1. **Home page Center** - It has Student Message Center: Calendar, discussion boards, emails.

2. **Online Course Navigation** - The student Logs in using the assigned ID and PW and enters into the desired course. This homepage contains the digital online curriculum for the four core subjects. Each chapter contains chapter and lesson resources, activities, and links for applications.

3. **Academic Resources** - This page directs students to the academic resources of the core subjects of English, Social Studies, Mathematics, and Science through hyperlinks, including interactive activities.
4. **E-library** – This center offers a collection of hardcover books that allows students to extend the study of literature to one’s choice of full-length novels and plays. Books also include short stories, poems, essays, or informational articles.

5. **Web resources** – This center includes virtual tours of college and university campuses, including Live College Webcams and a link to [http://www.campustours.com](http://www.campustours.com). This site also is linked to the Standardized Tests link for answers to frequently asked questions about the SAT and ACT tests. Additional information provides orientation of how to prepare for the tests and what to expect on test day. [https://sat.collegeboard.org/practice/sat-practice-test](https://sat.collegeboard.org/practice/sat-practice-test)

6. **Media Center** – This center has the video library, audio library, and print library.

7. **Progress Monitoring Center** - This center offers students Ongoing Assessment and Review: These tests and quizzes are tools students could use to check their understanding of each chapter and sub-units.

8. **The Test center** - The test center contains reading comprehension tips and strategies, reading comprehension practice, vocabulary strategies and practice, grammar, and English test practice and SAT multiple-choice writing practice.

The Test Center is also hyperlinked to the most updated New York State Standardized Assessment Regents for the four content subjects. Students can download any past Regents in the last ten years for review and practice (Chart 7).
### Chart 7: New York State Regents Websites for English, Social Studies, Math, and Sciences Subjects

<table>
<thead>
<tr>
<th>Subject</th>
<th>Website</th>
</tr>
</thead>
<tbody>
<tr>
<td>English Assessment Tests</td>
<td><a href="http://www.nysedregents.org">http://www.nysedregents.org</a></td>
</tr>
<tr>
<td>Test Description: There are two parts to this exam. The Listening section and the Reading section. Reading section components: The examination has four parts. Part 1 tests listening skills. Students are to answer eight multiple-choice questions. For Part 2, students are to answer all twelve multiple-choice questions. For Part 3, students are to answer all five multiple-choice questions and the two short constructed-response questions. For Part 4, students are to write one essay response. The complete test can be retrieved in the web link provided in this table.</td>
<td></td>
</tr>
<tr>
<td>Social Studies</td>
<td><a href="http://www.nysedregents.org">http://www.nysedregents.org</a></td>
</tr>
</tbody>
</table>
| Archived Regents Examinations | • Global History & Geography  
|                       | • U.S. History & Government                                               |
| Math                 | [http://www.nysedregents.org](http://www.nysedregents.org) |
| Archived Regents Examinations | • Geometry  
|                       | • Algebra 2/Trigonometry                                                   |
| College Board Homepage for all Advanced Placement information |
| Science              | [http://www.nysedregents.org](http://www.nysedregents.org) |
| Archived Regents Examinations | • Living Environment  
|                       | • Chemistry                                                               |
|                       | • Physics                                                                 |

### 3.7.6.2 Online Digital Textbooks

The homepage of the online digital curriculum contains the hyperlinks to the digital textbooks for each subject. Students have access to any course textbooks for all grade levels. The online window is the gateway to any subject textbook the student wishes to review. Specifically, the students follow three steps for choosing the desired textbook:
Step 1: The student is directed to choose the subject of interest.

Step 2: Student is asked to enter the location-specific resources.

Step 3: Student finds the book the teacher licensed for the subject class.

The homepage of each subject’s online window is found in Appendix E.

3.7.7 Parents’ Online Center

Parents’ Center — In the students’ course portal, there is the parent center, which provides information on recommendable elementary, middle, and high school literature book lists for all levels of reading. It also has the links to on-line references such as biographical dictionaries, thesauri, the entire Encyclopedia Britannica, and other academic web site resources, which parents can use to coach their children. An important part of this webpage is useful links teachers incorporated into the portal, which contains colleges and universities and their rankings available for students’ review: http://www.usnews.com/education

In this center, parents receive a login password at the beginning of the school year. Parents may login any time to review their child’s grade and academic performance in every subject.

3.8 The Implementation Process

The implementation of the blended learning Literacy Program involves the incorporation and integration of an online lab session into the face-to-face class instruction with a focus on literacy instruction to be taught by the Literacy Coach on a daily basis. On Monday, the Literacy Coach directs the class to reading skills and reading comprehension in English literature. On
Tuesday, the Literacy Coach teams-up with the Social Studies teacher to focus on improving literacy in Social Studies. On Wednesday, the Literacy Coach teams-up with the Math teacher targeting at math literacy, and on Thursday, the Literacy Coach co-teaches with the Science teacher focusing on Science literacy. On Friday, students perform their independent work and project assignments in the computer lab. In this blended learning Literacy program, the English learners receive the same instructional methodology as the rest of the mainstream students.

3.8.1 Subject Class Distribution in the Blended Classrooms

The following table describes the distribution of classes of the three grade levels. There are three English teachers, three History teachers, three Math teachers, and three Science teachers. A total of twelve subject teachers participated in the Blended Program. The duration time of each class is approximately 50 minutes. The 10th grade students attend grade level 10 English, World History, Geometry, and Biology. The 11th grade students attend grade level 11 English, American History, Advanced Algebra, and Chemistry. The 12th grade students attend grade level 12 English, Economics, Calculus, and Physics. The number of 10th grade students in the blended learning program is 23, the number of 11th grade students is 24, and the number of 12th grade students is 30. BL Class teachers and subjects are displayed in (Chart 8).
Chart 8: Total Subject Classes and Number of Students in the Blended Program

<table>
<thead>
<tr>
<th>Teacher</th>
<th>Subject</th>
<th>Grade Level</th>
<th>Total students</th>
<th>Mainstream in each class</th>
<th>ELLs</th>
</tr>
</thead>
<tbody>
<tr>
<td>E1</td>
<td>English level 3-4</td>
<td>10</td>
<td>23</td>
<td>18</td>
<td>5</td>
</tr>
<tr>
<td>H1</td>
<td>Global Studies</td>
<td>10</td>
<td>Same</td>
<td>Same</td>
<td>Same</td>
</tr>
<tr>
<td>M1</td>
<td>Algebra 1</td>
<td>10</td>
<td>Same</td>
<td>Same</td>
<td>Same</td>
</tr>
<tr>
<td>S1</td>
<td>Biology</td>
<td>10</td>
<td>Same</td>
<td>Same</td>
<td>Same</td>
</tr>
<tr>
<td>E2</td>
<td>English level 5-6</td>
<td>11</td>
<td>24</td>
<td>17</td>
<td>7</td>
</tr>
<tr>
<td>H2</td>
<td>American History</td>
<td>11</td>
<td>Same</td>
<td>Same</td>
<td>Same</td>
</tr>
<tr>
<td>M2</td>
<td>Algebra 2 &amp; Trig</td>
<td>11</td>
<td>Same</td>
<td>Same</td>
<td>Same</td>
</tr>
<tr>
<td>S2</td>
<td>Chemistry</td>
<td>11</td>
<td>Same</td>
<td>Same</td>
<td>Same</td>
</tr>
<tr>
<td>E3</td>
<td>English level 7-8</td>
<td>12</td>
<td>30</td>
<td>21</td>
<td>9</td>
</tr>
<tr>
<td>H3</td>
<td>Economics</td>
<td>12</td>
<td>Same</td>
<td>Same</td>
<td>Same</td>
</tr>
<tr>
<td>M3</td>
<td>Calculus</td>
<td>12</td>
<td>Same</td>
<td>Same</td>
<td>Same</td>
</tr>
<tr>
<td>S3</td>
<td>Physics</td>
<td>12</td>
<td>Same</td>
<td>Same</td>
<td>Same</td>
</tr>
</tbody>
</table>

The next Chart 9 describes the distribution of non-blended courses of the three grade level classes obtained from the program office. The number of 10th grade students in the blended learning program is 23, the number of 11th grade students is 25, and the number of 12th grade students is 29.
Chart 9: Total Subject Classes and Number of Students in the Non-BL Program

<table>
<thead>
<tr>
<th>Teacher</th>
<th>Subject</th>
<th>Grade Level</th>
<th>Total students each grade level</th>
<th>Mainstream</th>
<th>ELLs</th>
</tr>
</thead>
<tbody>
<tr>
<td>E1</td>
<td>English level 3-4</td>
<td>10</td>
<td>23</td>
<td>18</td>
<td>5</td>
</tr>
<tr>
<td>H1</td>
<td>Global Studies</td>
<td>10</td>
<td>Same</td>
<td>Same</td>
<td>Same</td>
</tr>
<tr>
<td>M1</td>
<td>Algebra 1</td>
<td>10</td>
<td>Same</td>
<td>Same</td>
<td>Same</td>
</tr>
<tr>
<td>S1</td>
<td>Biology</td>
<td>10</td>
<td>Same</td>
<td>Same</td>
<td>Same</td>
</tr>
<tr>
<td>E2</td>
<td>English level 5-6</td>
<td>11</td>
<td>25</td>
<td>17</td>
<td>8</td>
</tr>
<tr>
<td>H2</td>
<td>American History</td>
<td>11</td>
<td>Same</td>
<td>Same</td>
<td>Same</td>
</tr>
<tr>
<td>M2</td>
<td>Algebra 2 &amp; Trig</td>
<td>11</td>
<td>Same</td>
<td>Same</td>
<td>Same</td>
</tr>
<tr>
<td>S2</td>
<td>Chemistry</td>
<td>11</td>
<td>Same</td>
<td>Same</td>
<td>Same</td>
</tr>
<tr>
<td>E3</td>
<td>English level 7-8</td>
<td>12</td>
<td>29</td>
<td>21</td>
<td>8</td>
</tr>
<tr>
<td>H3</td>
<td>Economics</td>
<td>12</td>
<td>Same</td>
<td>Same</td>
<td>Same</td>
</tr>
<tr>
<td>M3</td>
<td>Calculus</td>
<td>12</td>
<td>Same</td>
<td>Same</td>
<td>Same</td>
</tr>
<tr>
<td>S3</td>
<td>Physics</td>
<td>12</td>
<td>Same</td>
<td>Same</td>
<td>Same</td>
</tr>
</tbody>
</table>

Students attend their first class during the day from 9:00 am to 4:00 pm. The first period is an advisory period. Students use this time to meet with the grade advisor. Lunch hour is the same for the whole school from 12:00-1:00pm daily. The blended learning program requires that participant students have their daily Literacy class in the computer room.

During the implementation process, the researcher visited the teachers’ Focus Group and Common Planning meetings where teachers worked collaboratively throughout the year on curriculum design, course work preparation, content delivery, daily class lesson templates, online curriculum design, face-to-face and online instructions, assessment tests, motivation strategies, and communication methods. The researcher noted that the collaborative disposition of the teaching team is an important anchor for teachers to design a successful literacy course, which facilitates monitoring of students’ progress across content subjects. The use of effective strategies is an important integral part of a lesson’s efficiency for students to achieve reading and
writing proficiency because the appropriate instructional strategies enable teachers to address difficulties that students encounter during learning.
3.8.2 Blended Learning Teachers’ Class Distribution (Chart 10)

Chart 10: Teachers’ Subject Class Distribution in the Blended Program

<table>
<thead>
<tr>
<th>Grade Level</th>
<th>English</th>
<th>History</th>
<th>Math</th>
<th>Science</th>
</tr>
</thead>
<tbody>
<tr>
<td>10th</td>
<td>Teacher E1</td>
<td>Teacher H1</td>
<td>Teacher M1</td>
<td>Teacher S1</td>
</tr>
<tr>
<td></td>
<td>10th Grade English</td>
<td>World History</td>
<td>Geometry</td>
<td>Biology</td>
</tr>
<tr>
<td>11th</td>
<td>Teacher E2</td>
<td>Teacher H2</td>
<td>Teacher M2</td>
<td>Teacher S2</td>
</tr>
<tr>
<td></td>
<td>11th Grade English</td>
<td>American History</td>
<td>Adv. Algebra</td>
<td>Chemistry</td>
</tr>
<tr>
<td>12th</td>
<td>Teacher E3</td>
<td>Teacher H3</td>
<td>Teacher M3</td>
<td>Teacher S3</td>
</tr>
<tr>
<td></td>
<td>12th Grade English</td>
<td>Economics</td>
<td>Calculus</td>
<td>Physics</td>
</tr>
</tbody>
</table>

Once the blended learning literacy program had been implemented for a while, the researcher was interested in finding out the teachers’ perceptions about blended learning experiences regarding pedagogy, digital curriculum, students learning, and professional training. Consequently, an interview with participating teachers was scheduled to explore and examine the effectiveness of the implemented blended learning literacy program (Ref. 3.8.3). Many teachers expressed that the introduction of a blended learning platform offered alternative and innovative ways for teachers to organize their time and improve the instruction and learning processes. Teachers believed that students have the chance to increase learning opportunities not only in the traditional classroom but also outside of the classroom setting. The following section describes the various interviewing themes covered in the teachers’ interviews.
3.8.3 Teachers’ Interview Questions

The personal face-to-face interview is one of the most common methods for qualitative study in the field of Social Sciences research. “Social cues, such as voice, intonation, body language etc. of the interviewee can give the interviewer a lot of extra information that can be added to the verbal answer of the interviewee on a question” (Irvine et al., 2006, p. 6). One advantage of using the interview tool for data collection is that it “allows people to convey to others a situation from their own perspective and in their own words” (Kvale, 1996). The researcher, acting as an evaluator, believes that the participants’ perspectives and opinions affect and contribute to the successful implementation of this case project.

In general, the interviewing questions covered teachers’ beliefs about the literacy program, the blended learning pedagogy and implementation, and their views on the benefits of each component of the learning environment: Face-to-face (FTF), Online (OL), and Blended Learning (BL). There were two teacher interviews. In the first interview, the researcher used a structured interviewing method in which conversations were carefully phrased and guided by a list of questions to ensure that the interview administration was systematic and consistent with each interviewee. The aim of the first interview was to solicit teachers’ general opinions on the Blended Learning Literacy Program. This included teachers’ knowledge and attitude towards blended learning instruction at the dawn of the program’s implementation process. The first interview occurred in October after teachers had a month of experiences with the blended learning instructional portal. Each personal interview lasted between 30 to 40 minutes. The interview questions were guided by two main objectives: (1) To find out about the teachers’ beliefs and attitudes regarding the incorporation of a literacy program within the students’
curriculum to achieve content literacy using the blended learning model of instruction. (2) To find out about teachers’ perspectives on the advantages of using blended learning instruction for teaching content literacy in their subject classes.

The second series of interviews were conducted in Term 2 in the same academic year of 2013-2014 after the teachers had a few months of instructional practices and experiences. These were arranged as departmental group interviews. The researcher encouraged free and open responses in order to elicit respondents’ perspectives, opinions, and attitudes regarding particular topics, themes, and issues of the teacher-designed blended learning Literacy Program. In both interviews, the researcher intended to draw out meaningful descriptive experiences from the participants in their own words. The researcher played the dual role of a listener and a questioner and was guided by a set of prepared questions. As recommended, the interview was primarily meant to be driven by the participants (Taylor & Bogdan, 1998). The aim of the second interview was to learn about the impact of blended learning on teacher pedagogy, student learning, teacher-student interaction, and student engagement and motivation.

For recording purposes, the researcher used the subject’s class name instead of the teacher’s real name. For example, E1 (10th grade English teacher), E2 (11th grade English teacher), E3 (12th grade English teacher), H1 (10th grade World History teacher), H2 (11th grade American History teach), H3 (12th grade Economics teacher), M1 (10th grade Geometry teacher), M2 (11th grade Algebra 2 teacher), M3 (Calculus teacher), S1(10th grade Biology teach), S2(11th grade Chemistry teacher), and S3(12th grade Physics teacher). Every participant teacher came for the first personal interview in the month of September, and the second department interview between the months of April and May. All interviews were recorded using the I-Phone and
documented using Microsoft Word at the end of each session. These were the teachers’ First Interview questions:

1. What do you think of having a literacy program for improving content reading proficiency? What do you know about the blended learning concept: Please explain whether you are in favor of this new trend of learning?

2. What advantages do you see in using blended learning to teach content literacy for your subject class? Do you see any disadvantages from your perspective for using this model for teaching and learning? In your opinion, do you think the blended learning model supports literacy instruction across content learning?

3. Do you believe that there are more advantages of using the blended learning model for instruction as compared with only the face-to-face or online method?

4. Do you believe that professional training is essential for you and your students to effectively use the web-based course site?

5. Do you prefer that you self-train for learning the web-based course site; participate in-house professional development, or receive training from outside consultants?

6. What technology tools do you use most in the delivery of instruction? Overhead projector, computer-assisted instruction (CAI), interactive simulations, digital media tools, or others?

Second interview questions:

1. As members of your subject department, do you find the online course portal beneficial to your teaching the course, and students learning the course work? Which part of the portal do you like most?
2. How does the incorporation of the online component affect the way you plan and teach your subject?

3. How do you integrate the lesson into face-to-face and online instruction?

4. Please describe how you adapt the course materials for the blended format. How do you decide what to use for face-to-face and for online activities?

5. What are the difficulties and challenges you face, and how did you overcome these challenges?

6. Do you see changes in your teaching style and how do these changes affect your curriculum planning and instructional delivery, as well as your relationship and interactions with your students? Do you see changes in your instructional role in the blended classroom?

7. What do you think of the “flipped classroom’ instruction, and what kind of flipped strategies do you use in your class?

8. How did the blended learning model influence your lesson planning, curriculum mapping, and course work delivery in your subject area?

9. What observations have you made regarding students’ ability to apply reading comprehension strategies in the blended classroom for better understanding of the subject you teach (humanities or non-humanities subjects) in the hybrid-learning environment in these areas?

   - Make connection with prior knowledge
   - Improve questioning techniques
   - Visualize and make intelligent inferences
- Determining text importance to support information synthesis

- Identify, highlight, and remember important points and underlying meanings in the reading of a piece of text

10. How do you help students to think critically and analytically about texts, and use multiple reading strategies, including a variety of digital media in the online digital curriculum in making connections both within a text and among texts?

11. How do you help students to distinguish important facts from extraneous details in the blended learning environment? Recognize and identify literary elements for analysis, such as diction, tone, image, or figurative language?

12. Do you find the blended learning method useful to provide textual evidence for claims and inferences in the face-to-face classroom via online resources? How do you do this?

13. How do you teach your students to take notes and annotate texts? What kinds of strategies do you use to help students practice attentive reading in the face-to-face and in the online lab?

14. How did the blended environment affect students’ attitude and motivation towards learning? Do you observe that the blended learning environment encourages students’ engagement and improve students’ intrinsic motivation towards learning?

15. Do you believe that the blended learning method supports content literacy and improves students’ performances in the subject you teach?

16. In your opinion, how do you think blended learning affects students’ attitude regarding college studies and future work opportunities?

17. Can you give examples of how students improve in the Literacy Learning Objectives?
18. Do you think the blended learning method of teaching and learning has an impact on students’ engagement in both the face-to-face and online classes, and enhances students’ intrinsic motivation?

19. What advice would you give to the next group of teachers who will try to implement blended learning in their classes?

3.8.4 Teachers’ Questionnaires Survey

After each personal interview, the researcher examined the interviewers’ responses and used them as a reference guide to design the post-interview questionnaires survey. The Rating Scale was rated on Agree/Neutral/Disagree. The teachers’ questionnaires contain four main themes:

**Theme 1:** Teachers’ beliefs about the incorporation of the literacy program into the content curriculum using blended learning methodology

**Theme 2:** Teachers’ beliefs about pedagogy and learning and their opinions on the advantages of face-to-face environment

**Theme 3:** Teachers’ beliefs about the advantages of face-to-face environment

**Theme 4:** Teachers’ beliefs about the advantages of blended learning environment

The teacher post-interview questionnaire survey is found in Appendix F.

3.8.5 Students’ Interview Questions

Interviews with individual students were conducted throughout the spring term in the second semester. During the entire school year, students were invited to the researcher’s office to talk about their experience with BL. The purpose of these interviews, which were often followed by the questionnaires survey, were intended to elicit from students their perception of
and attitude towards their BL experiences. Students’ interviewing questions were guided by themes focused on eliciting students’ views and attitude regarding the BL concept and experiences. The researcher was interested also in finding out students’ opinions regarding the role of teachers in the learning process. These were the student interview questions:

1. What is the main reason for your interest in participating in the blended learning course? What learning platform do you like most? Traditional face-to-face, online alone, or blending face-to-face with online?

2. What are your perceptions on the face-to-face, online, and blended learning environments, and how would you describe your blended learning experiences in terms of online resources, improving literacy in content subject, and academic performance?

3. When you hear the word literacy, what do you conjecture in your mind? How important is it for you to read with fluency and understanding?

4. How important is it for you to gain the skills in your literacy classes at identifying and maintaining an objective and unbiased view in this information explosion age?

5. Do you think BL instruction makes a difference to your learning? Do you think the preparation of technology skills is important for your college studies and future work?

6. How do you use the course site to help you prepare your study and for college studies?

7. Do you find the Blended Learning Literacy Program helpful for improving your understanding of complex texts in the Math and Science subjects?

8. What do you think contributes to a successful learning environment? Teachers, technology, parents, and yourself.
9. What is your opinion regarding the teacher’s role in your education, and in the new blended learning environment? Do you think teachers play a vital role in your learning process?

3.8.6 Teachers’ Professional and Technology Training

Part of the implementation plan was the professional development for teachers. One week before school began, teachers uploaded their digital curriculum and syllabus onto the Course Site. The Course Site is an Internet-based educational portal that requires teachers to have both technical and software training in order to know how to use the component parts of the portal. This learning portal is an interactive educational system that offers abundant learning opportunities and supplementary materials that students can access both within and beyond the classroom. Before the term started, the researcher provided teachers with the uploaded teacher-designed curriculum content on the Course Site. Teachers received professional development in the theoretical and practical aspects of the Portal’s functions and utilities. When asked what kinds of professional training would interest teachers most, all of them suggested a combination of face-to-face and online training experiences. The online Webinar’s live training was the teachers’ favorite. Several teachers commented that Webinar is convenient because it allows easy access to specific information in which viewers have manifested a particular interest. Numerous teachers have expressed their opinions that the greatest advantage of using Webinar is the possibility of recording the training sessions and personally scheduling additional viewing time at other available moments. However, some teachers believed that the absence of real time FTF interactions might take away the occasions for in-depth questioning. The researcher honored
the blended learning teachers’ requests by providing in-house training in the summer and throughout the year.

The practical training included hands-on practices on the different components of the Course Management Portal: Teacher resources, classroom setup and student roster, online management tools, Content management tools, and announcement and alerts. At the end of each training session, teachers practiced uploading their own teaching instructions and materials onto the portal. The researcher spent time coaching each teacher individually throughout the training process to ensure that everyone was comfortable and was gaining proficiency in the use of the Course Site.

3.8.7 Practical Training Workshop for Participant Teachers

The researcher provided practical training to teachers in August 2013 during the summer workshop: Two days of the workshop week were devoted to the Course Site training and three days to curriculum and syllabus. Each subject teacher worked with the researcher in defining and developing the instructional materials that could be effectively interfaced with the online portal. After teachers learned how to use the Course Site software, they turn-keyed the knowledge to each of their class students through specially designed student training workshops.

3.8.8 Practical Training Workshop for Participant Students

Teachers believe that training students to be able to use the portal at the proficiency level of the Course Site is essential in supporting students’ effective and proficient use of the content materials, and thus directly affects academic performances. From conversations with students during the term, the researcher was impressed to learn that the majority of students favored one-on-one training over group training. One student commented, “I need the teacher to walk
me through in every part of the portal, otherwise, I waste too much time trying to figure out how to go from one place to another. At the end, technology becomes an obstacle for me instead of a support to do my work.” A specific time was scheduled at the beginning of the year to integrate training into the school calendar on a regular basis because training sessions are so important for both teachers and students to become proficient users of the course portal.

3.9 Evaluation of the Blended Learning Literacy Program

Evaluation of the blended learning literacy model is focused on assessing the model’s effectiveness on students’ literacy improvement across content subject learning, as well as on how teachers exercise their leadership role and build quality instruction in the blended learning environment. To this end, the researcher prepared a set of questions for another student interview to find out how students conceive the benefits of the implemented blended learning literacy program designed by the teachers. Several open-ended questions were designed to gather students’ attitudes and opinions regarding their conceptions of the hybrid environment. The following are the questions between the researcher and students.

3.9.1 Students’ Questionnaires Survey

After the personal interview, every student was invited to come back on another day to take the questionnaires survey on a voluntary basis. The researcher organized the students’ responses into categorized themes. The purpose of the survey was to obtain feedback from each student regarding every aspect of the blended learning environment. Seventy-five out of 77 students came to the interviews. The student questionnaires survey contains six domains as follows:
Domain 1: Students’ learning environment preference

Domain 2: Students’ beliefs about the traditional face-to-face learning environment

Domain 3: Students’ beliefs about the online learning environment

Domain 4: Students’ beliefs about the blended learning environment

Domain 5: Students’ perceptions of the blended learning instruction for supporting literacy achievements in reading and content subject comprehension

Domain 6: Students’ perception of blended learning for improving motivation and engagement

The student questionnaires survey is found in Appendix G.

3.9.2 Parents’ Interview Questions

At the end of the school year, the researcher and blended learning teachers initiated a Parents’ Workshop for those parents who have their children enrolled in the blended learning Literacy Program. The interview objective was twofold: This section describes the main themes that were contained in the conversations between the researcher and parents: (1) Parents’ perception of their role in their children’s education. (2) Parents’ perception of the incorporation of the Literacy Program into the core subjects using BL methodology. The following are parents’ interview questions.

Question 1: What is your opinion regarding communication with teachers? Do you think that teachers play an important role in affecting student achievement, engagement, motivation, and attitude towards academic work?

Question 2: What do you think of the Literacy Program, and content literacy? Do you believe in the importance of reading literacy?
Question 3: What do you think of the Literacy Program using the BL model for instruction and learning? What is your opinion of the teachers’ efforts in creating a teacher-designed digital curriculum for the blended learning instruction?

3.9.3 Parents’ Questionnaires Survey

At the end of each interview, parents were asked to participate freely in the following questionnaires survey. The parents’ questionnaires survey is described in Chart 13. The parents’ questionnaires survey contains two main domains:

**Domain 1:** Parents’ perception of their role in their child’s education

**Domain 2:** Parents’ perception of the incorporation of the literacy program into the core subjects using blended learning methodology

The teachers made references to students’ and parents’ questionnaires survey feedback to review and improve the different aspects of literacy program, and to upgrade the quality of their class instruction. The parents’ questionnaires survey is found in Appendix H.

3.10 Data Collection Process

This section describes the data collection process and the use of the qualitative research instruments that include questionnaires, in-depth interviews, and observations throughout the entire school year of 2013-2014. The qualitative data were obtained from interviews of teachers, students, and parents. Additional data were obtained from observations of face-to-face and online classroom activities. The qualitative data collected from teacher, student, and parents’ interviews and the accumulative observations of planning meetings provided useful information on how teachers made the transition from traditional paper-based to digital curriculum within
the blended learning environment. The post-interview questionnaires further provided a concrete database for deepening understanding of teachers’ and students’ opinions on the blended learning environment and their blended learning experiences at different times of the school year. Finally, students’ grades at the end of Term 1 and Term 2 were collected in February and June. These grades were used to evaluate and compare performances between the blended classes and non-blended classes according to grade level and subject of English, Social Studies, Math, and Science. The Excel spreadsheet software with the statistical functionality was used to record the collected data from each occasion. The researcher used two types of statistical analysis tools for data collection and analysis: MS Excel program and the statistical package SPSS 22 software for this purpose. Both are easy to use for creating, coding, and decoding variables. The Excel program provides three basic types of information entries: labels, values, and formulas (Saldana, 2009). The Excel spreadsheet “includes automatic graphing features with the ability to plot bar chart, pie graphs, histograms, and scatter grams from the spreadsheet data” (Bialas, 2001, p. 3). The statistical software SPSS 22 (the latest version of a Windows/Mac OS program) was used in this investigation for data management of Term 1 and Term 2 grades to create tables and graphs, and to perform quantitative analysis.

3.10.1 Data Collection Timeline and Schedule

The researcher planned the following timeline chart for data collection over the entire school year from August 2013 to June 2014. (Chart 11)
**Chart 11: Data Collection Timeline**

<table>
<thead>
<tr>
<th>Timeline 2013-2015</th>
<th>Agenda</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>2013 August (3rd week) Two-week Workshop</strong></td>
<td>Review teachers’ and students’ BL and Non-BL Programs. Prepare course curriculum, syllabus, and class notes for BL instruction. Researcher provides teachers ten hours of training on the Web-based Course Site management portal. Administer teachers’ demographics questionnaires. Administer teachers’ computer experience questionnaires.</td>
</tr>
<tr>
<td><strong>September</strong></td>
<td>Administer students’ demographics questionnaires. Teachers’ turnkey training to students. Researcher begins class observations rotation. Researcher chairs and collects data from the 1st Common Planning (CP) meeting. Researcher begins some interviews with students and continues throughout the year.</td>
</tr>
<tr>
<td><strong>October</strong></td>
<td>Researcher begins classroom observations daily. Researcher chairs 2nd monthly Focus Group (FG) meeting, and collects data from the meeting, such as agendas and minutes. Researcher joins teachers’ weekly CP sessions. Researcher administers questionnaires to parents during parents’ conference meeting. Researcher begins interviewing teachers (1st Interview). Administer the questionnaires survey after each interview.</td>
</tr>
<tr>
<td><strong>November</strong></td>
<td>Researcher conducts class observations daily. Researcher chairs monthly FC meeting and collects the meeting agendas and minutes. Researcher observes teachers’ weekly Common Planning meetings.</td>
</tr>
<tr>
<td><strong>December</strong></td>
<td>Researcher observes classroom teachers daily and teachers’ CP Sessions. Researcher chairs the monthly Focus Group meeting and collects the agendas and minutes.</td>
</tr>
<tr>
<td><strong>2014 January</strong></td>
<td>Researcher observes classes daily. Researcher chairs monthly FG Meeting, collects meeting agendas and minutes. Researcher observes teacher’s weekly CP sessions.</td>
</tr>
<tr>
<td>Month</td>
<td>Activities</td>
</tr>
<tr>
<td>------------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>February</td>
<td>Researcher observes classes daily.</td>
</tr>
<tr>
<td></td>
<td>Researcher chairs monthly FG Meeting, collects meeting agendas and minutes.</td>
</tr>
<tr>
<td></td>
<td>Researcher observes teachers’ weekly CP sessions.</td>
</tr>
<tr>
<td></td>
<td>Researcher collects student report cards and conducts evaluation of grade performances of the BL and No-BL students.</td>
</tr>
<tr>
<td></td>
<td>Researcher starts interviewing students after school.</td>
</tr>
<tr>
<td></td>
<td>Researcher conducts Group Interview with FG teachers.</td>
</tr>
<tr>
<td>March</td>
<td>Researcher observes classes daily.</td>
</tr>
<tr>
<td></td>
<td>Researcher chairs the monthly FG session, collects the agendas and minutes.</td>
</tr>
<tr>
<td></td>
<td>Researcher observes teachers’ weekly CP meetings.</td>
</tr>
<tr>
<td>April</td>
<td>Researcher observes classes weekly Researcher chairs monthly FG sessions, records meeting minutes.</td>
</tr>
<tr>
<td></td>
<td>Researcher observes teachers’ weekly CP sessions.</td>
</tr>
<tr>
<td></td>
<td>Teachers’ 2\textsuperscript{nd} interviews.</td>
</tr>
<tr>
<td></td>
<td>Administers questionnaires survey.</td>
</tr>
<tr>
<td>May</td>
<td>Researcher meets with each department staff for BL Program evaluation.</td>
</tr>
<tr>
<td></td>
<td>Researcher administers questionnaires survey to students and parents during Parents’ Conference Night.</td>
</tr>
<tr>
<td>June</td>
<td>Researcher organizes data for qualitative and quantitative data analysis.</td>
</tr>
<tr>
<td></td>
<td>Researcher begins drafting the summary of research findings, data analysis, discussion and recommendations for future studies</td>
</tr>
<tr>
<td>September –January, 2015</td>
<td>Researcher writes up the research study.</td>
</tr>
</tbody>
</table>
3.10.2 Interviews and Questionnaires Survey Schedule

The researcher planned the following interview schedules with teachers and students distributed throughout the year. (Chart 12)

**Chart 12: Interviews and Questionnaires Survey Schedules**

<table>
<thead>
<tr>
<th>Teacher Interviews by the researcher</th>
<th>Month/Time</th>
<th>Location</th>
<th>Student Interviews by the researcher</th>
<th>Month/Time</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demographics Questionnaires</td>
<td>August</td>
<td>Library</td>
<td>Demographics Questionnaires</td>
<td>September</td>
<td>Classroom</td>
</tr>
<tr>
<td></td>
<td>Summer</td>
<td></td>
<td></td>
<td>First day of class</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Workshop</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>1st Interview: One-on-One</strong></td>
<td>October</td>
<td>Teachers’ Lounge</td>
<td>Each interview followed by the Questionnaires Survey</td>
<td>February – May 15,14</td>
<td>Library</td>
</tr>
<tr>
<td></td>
<td>5:00pm</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>1st Questionnaires Survey</strong></td>
<td>November</td>
<td>Teachers’ Lounge</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>5:00pm</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>2nd Interview: Department Interviews followed by Questionnaires</strong></td>
<td>April – May</td>
<td>Teachers’ Lounge</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>20 5:00pm</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Final Questionnaires Survey</strong></td>
<td>May 30</td>
<td>Teachers’ Lounge</td>
<td>Final Questionnaires Survey</td>
<td>Between May – June</td>
<td>Researcher’s office</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

3.11 Data Collection Instruments

The variety of instruments used to collect data for the research work includes notes of (1) Instructional Focus Group (2) Teachers and students’ technology training (3) Interview and questionnaire surveys (4) Teacher observations (5) Observation of student activities (6) Students’ performance grades.
3.11.1 Instructional Focus Groups

The first Focus Group meeting was held in August 2013. The aim was to discuss the blended learning literacy program research study. The research team was established to be composed of the researcher, blended learning participant teachers, the Literacy Coach, and the Data Analyst of the school, who was also the researcher. The Focus Group was formed because everyone felt that any process of change required not only some personal adjustments but also acquiring a shared belief and understanding among teachers who are committed to the same program mission. A special type of focus group meeting called the Teacher Common Planning meeting was also organized: Blended learning teachers met weekly to discuss lesson plans, students’ work, use of the Course Site Web and the Course Site Management Portal, technologies integration in the classroom, and any issues related to FTF and OL activities.

As teachers acquired the new instructional approach, Sandholtz et al (1997) pointed out that teachers tend to increase their interactions, collaborations, share new ideas on instructional initiative, and offer support with each other. On the other hand, Brooks & Brooks (1993) emphasized that changes sometimes require “willing abandonment of familiar perspectives and practices and the adoption of new ones” (p. 172).

3.11.2 Observation Reports of Blended Instruction

The researcher observed at least one class daily focusing on teaching strategies, students’ engagement, and teacher-student interactions. In the secondary school setting, informal observations play a specific role for the department supervisors. An informal observation gives the evaluator the opportunity to maintain the ‘big picture’ of a teacher’s performance in the
classroom. Through informal classroom visits, the researcher watched how students interacted with technologies, with the online materials, and with peer students in the learning process. The classroom observation checklist usually consisted of four areas of observations.

1. Instructional delivery and presentation
2. Student involvement/engagement
3. Questioning techniques
4. Classroom environment, climate and management

One of the aims of the formal observations in this case study was to establish a shared vision for effective blended learning practices among teachers. The observation practice is an effective way of gathering field notes and recording all accounts while assessing the teachers’ daily operations in their own classroom. The method is distinctive because the researcher approaches participants in their own environment rather than having the participants come to the researcher. This observation strategy facilitates the researcher to learn about life as an insider; it is revealing and useful for gaining an understanding of the physical, social, and cultural contexts where the participants work.

The multi-level perspectives presented by the various types of data generated in this mixed research study allow the researcher a deeper knowledge of the interplay among the participants. By observing participants’ daily activities in their instructional settings, the researcher could see if there is consistency between what teachers or students do in the classrooms with what they say in the interviews and write in the survey questionnaires. Therefore, observation can be a powerful tool to check against what people report about
themselves during interviews and focus groups. The summary data collected from a series of walk-throughs, together with formal reports, provided valuable information and objective views of teacher instruction and activities as well as students’ interaction with technologies and with each other. The researcher reviewed the teacher-designed rubrics prepared by teachers themselves during their Common Planning time, and used it as a guide to observe teachers’ class instruction. The observation template is formatted with two columns. Each observation report consists of a list of six quality domains for assessment. The first column is listed with the domains for assessment:

1. Content Knowledge: The extent to which the teacher demonstrates knowledge of subject matter and curriculum
2. Preparation: The extent to which the teacher demonstrates knowledge of pedagogy in lesson planning
3. Instructional Delivery: The extent to which the teacher demonstrates proficiency of instructional delivery
4. Classroom Management: The extent to which the teacher demonstrates effective management skills
5. Knowledge and Appreciation of Student Diversity and Development: The extent to which the teacher displays knowledge of students’ learning styles
6. Student Assessment: The extent to which the teacher employs assessment techniques based on appropriate learning standards

The second column allows space for the observer to write notes according to the following criteria:

1. Exceeds Expectations
2. Meets Expectations
3. Approaching Expectations
4. Does not Meet Expectations

In total, the researcher had visited each participant teacher several times and wrote more than 100 formal reports throughout the year. Within two weeks after each observation, the researcher held a debriefing session with the subject teacher to discuss his or her observation report. The following is the observational report protocol. (Chart 13)
Chart 13: Observation Report Protocol

<table>
<thead>
<tr>
<th>Teacher:</th>
<th>Subject Class</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date:</td>
<td>E1 E2 E3 H1</td>
</tr>
<tr>
<td>Time:</td>
<td>H2 H3 M1 M2</td>
</tr>
<tr>
<td>Subject Area:</td>
<td>M3 S1 S2 S3</td>
</tr>
</tbody>
</table>

### A. Content of Lesson Organization

1. Make clear statement of the purpose of the lesson
2. Define relationship of this lesson to previous lessons
3. Present overview of the lesson
4. Place lesson approximately
5. Summarize major points of lesson
6. Relate lesson of the day to future lesson
7. Use a wide variety of classroom and online resources
8. Make insightful connections between standards and curriculum
9. Break down content into understandable concepts
10. Prepare lesson plan with instructional objectives at appropriate level of difficulty

### B. Instructional Presentation

1. Explain ideas with clarity
2. Maintain communication contact with students
3. Listen to student questions and comments
4. Define unfamiliar terms, concepts, and principles
5. Present examples to clarify points
6. Relate new ideas to familiar concepts
7. Restate important ideas at appropriate times
8. Vary explanations for complex and difficult materials
9. Use humor appropriately to strengthen retention and interest
10. Limit the use of repetitive phrases
11. Utilize a wide variety of teaching styles to address multiple learning styles

### C. Questioning Techniques

1. Questioning maximizes student involvement, including challenging the response of others
2. Inquiry-based techniques are used to develop critical thinking skills and logic
3. Ask purposeful questions
4. Students are encouraged to answer questions in complete sentences
5. Questions are cleared and varied
6. Instructor elicits concepts and values, as well as facts
7. Employs sound questioning techniques with appropriate follow up in order to engage students analytically
8. Ask probing questions when students’ answers are incomplete
9. Encourage students to answer difficult questions
10. Restating questions and answers when necessary
### D. Instructor-Student Interactions

1. Encourage class questions
2. Encourage class discussions
3. Asked questions to monitor students’ progress
4. Respond to nonverbal cues of confusion, boredom, and curiosity
5. Pace lesson to allow time for note taking

### E. Classroom Management

1. Prepare students for the lesson with appropriate assigned reading
2. Support lesson with useful classroom discussions and exercises using BL techniques
3. Present helpful digital or audio-visual materials to support lesson development and instruction
4. Provide relevant pre-assigned reading and written assignments in preparation of the follow up class

### F. Knowledge/Appreciation of Student Development

1. Exhibits high degree of caring and sensitivity to the needs of children and family
2. Possesses and demonstrates an in-depth understanding of student development stages
3. Utilizes a variety of developmentally appropriate instructional strategies
4. Accommodates student learning styles

### G. Student Assessment

1. Effectively communicates learning goals to students
2. Uses a wide variety of means and instruments, including instruction embedded assessment to assess student achievement of learning goals and standards
3. Effectively uses student performance data in planning instruction
4. Maintains in-depth records of student performance
5. Promotes student self-assessment

A few of these observation reports are found in **Appendix H:**

1. 10th and 12th grade English classes
2. 10th grade Social Studies (Global Studies class)
3. 11th grade Social Studies (American History class)
4. 12th grade Social Studies (Economics class)
5. 10th grade Mathematics (Geometry class)
6. 10th grade Science (Biology class).
3.11.3 Observation on Students’ Engagement in the Blended Classroom

The researcher identified three categories for checking the kinds of activities each student is engaged in during the online session: Academic activity, non-academic activity, and chatting with each other. The following (Chart 14) is the class activity template for recording students’ participation and engagement pattern.

Chart 14: Observation Reports on Class Activities and Student Engagement (N=77)

<table>
<thead>
<tr>
<th>Domain</th>
<th>Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>I. Academic Activity</td>
<td>1.1 Working on assignments</td>
</tr>
<tr>
<td></td>
<td>1.2 Working on projects</td>
</tr>
<tr>
<td></td>
<td>1.3 Team working with peer students</td>
</tr>
<tr>
<td>2. Non-Academic Activity</td>
<td>2.1 Facebook</td>
</tr>
<tr>
<td></td>
<td>2.2 Email</td>
</tr>
<tr>
<td></td>
<td>2.3 Google for personal matters</td>
</tr>
<tr>
<td></td>
<td>2.4 Non-academic games</td>
</tr>
<tr>
<td>3. Chatting with each</td>
<td>3.1 Talking</td>
</tr>
<tr>
<td></td>
<td>3.2 Playing or walking around the room</td>
</tr>
</tbody>
</table>
3.12 Students’ Reports on Grade Performance of Term 1 and Term 2 (2013-2014)

Assessment tests perform the essential role of measuring student achievement and determining their mastery of skills. Besides the administration of weekly quizzes, each blended learning teacher agreed to design the mid-term exams using the standardized assessment tests found in the Teachers’ Edition Manual as a standardized way of assessing the students’ final performances at the end of each term. The 11th or 12th grades students normally participated in the New York States Regents Examinations, which are offered two times a year. For the Social Studies, Math, and Science Departments, teachers modeled the final examination after the New York State Regents Examination. The Testing Center, as mentioned previously in the students’ course portal, has hyperlinks to the New York State’s previous and most updated Regents Exams where students can visit the site anytime for self-practice, in the lab, in-class, or at home. Term 1 and Term 2 course grades of the blended and non-blended classes of the 10th, 11th, and 12th grades were obtained from the Program Office. The grades were organized vertically and the subjects were arranged horizontally for each student. This arrangement covered the four subjects of English, Social Studies, Math and Science using an Excel spreadsheet. The researcher created a database for the SPSS program and conducted statistical analysis of the results in order to answer research question #6. The SPSS 22 was used in this research study to perform data entry, create tables, and Box Whisker diagrams, and perform statistical analysis on the research results. The 12th, 11th, 10th BL students’ final Term 1 and Term 2 grades are found in (Appendix K). The 12th, 11th, 10th Non-BL students’ final Term 1 and Term 2 grades are found in (Appendix L).
3.13 Summary

The researcher used the thematic analytic method for classifying, identifying, coding, and tabulating data collected from the accumulated data. “The most basic comparative approach is to note themes present in the text from each group being compared and determine which themes are the same and which are different” (Guest et al, 2012, p. 40). The researcher was interested in the frequency of the thematic codes applied to each group between Term 1 and Term 2 to note if there are similarities, differences, or changes of the behavior patterns from Term 1 to Term 2. “You can use graphing or clustering techniques to compare patterns of qualitative discourse in the text from different subgroups. The analytic choices for comparing qualitative data are quite rich” (Guest et al, p. 40).

The researcher examined the teachers and students’ interview contents, and used them to formulate the questionnaires for the post-interview surveys for participant teachers and students. The post-interview questionnaires were meant to supplement and complete the interview data collection process (Olsen, 2004). In Olsen’s opinion, there is no contradiction in having both the qualitative and quantitative analysis shed more light on a research topic. In this case study, the in-depth interview inquiries and relevant literature served as the basis for creating the questionnaire survey.

To ensure the quality of the research process, the researcher checked carefully the qualitative and quantitative data for consistency and accuracy. In the process of reviewing the interviews’ content, the research questions were revisited to ensure that the data analysis activities were aligned with the research objectives. “Before embarking on analysis, the research
team should review the study’s research questions and objectives to refresh their focus and make certain the analysis is framed to inform these” (Olsen, 2004, p. 13).

To address research question 1 regarding the impact of blended learning on students’ academic achievement in the four content subjects, the quantitative analysis using the SPSS 22 statistical software was used to evaluate Term 1 and Term 2 academic performance data of blended learning and non-blended learning of students at three grade levels in four content subjects: English, Social Studies, Math, and Science. The aim was focused on finding out any statistically significant changes in student achievement in each subject taught using the blended learning method. The following (Chart 15) summarizes the data analysis procedures in the current study. To address research questions 2-6, attention was focused on the teachers, students’ and parents’ perceptions on blended learning design and the implementation of various instructional strategies used for teaching and learning. To this end, the qualitative analysis was performed to evaluate interviews, questionnaires, observations notes from Focus Groups and Teacher Common Planning meetings, and classroom observations of teachers and students. These data were audio recorded, analyzed, transcribed, and categorized for analysis purposes. Teacher observation reports were used mainly for relevant references to gain more in-depth understanding of how teachers teach and students learn in the classrooms.
Chart 15: A Summary of the Data Collection Procedure

<table>
<thead>
<tr>
<th>Research Question</th>
<th>Thematic Focus</th>
<th>Data Source and Instrument</th>
</tr>
</thead>
</table>
| 1. How does the blended learning model affect teachers’ beliefs about blended learning instruction and curriculum design? | ➢ Teachers’ perceptions, opinions, attitudes, on blended learning | ➢ Teacher interviews and Questionnaires Reports  
 ➢ Observational notes of Focus Groups and Teacher Common Planning meetings |
| 2. How does the blended learning method of learning affect students’ beliefs about the components of BL model: face-to-face, online, and blended learning? | ➢ Students’ perceptions on the advantages of face-to-face, online, and blended learning environments  
 ➢ Students’ learning process in the face-to-face and online classrooms | ➢ Student Interviews and Questionnaires Reports  
 ➢ Observation notes on classroom instruction  
 ➢ Learning activities in the classrooms |
| 3. How do blended learning methodologies influence or change students’ engagement, involvement and motivation towards learning? | ➢ Students’ perceptions of the advantages of FTF, OL, and BL learning environments  
 ➢ Students’ learning process in the FTF and OL classrooms  
 ➢ Students’ engagement in class activities  
 ➢ Class activities: questions and responses  
 ➢ Impact of using blended learning on improving language literacy and content subject achievements | ➢ Students’ interviews and Questionnaires Reports  
 ➢ Observation notes on classroom instruction  
 ➢ Learning activities in the classrooms  
 ➢ Student interviews and Questionnaires Reports  
 ➢ Observations of students’ activities in class |
| 4. Does the use of BL instruction affect students’ literacy achievements in content subject reading comprehension: Making connections with prior knowledge, visualizing concepts and ideas, asking meaningful questions, making inferences and synthesizing content materials? | ➢ Parents’ perceptions about heir children’s education and technologies use | ➢ Parents’ interviews and questionnaires |
| 5. How does the new approach to education bring about a change in parents’ attitude towards their children’s education? | ➢ Term 1 and Term 2 grade score evaluation | ➢ Students’ performance scores  
 ➢ Use of SPSS to perform data analysis of BL and Non-BL grades |
CHAPTER 4: RESEARCH FINDINGS

4.1 Overview

This chapter describes the research results of each of the research questions 1-6 based on a mixed research methodology. Question 1 is addressed by using the quantitative findings, while questions 2 to 6 are evaluated based on findings from personal interviews, observation of teachers’ instruction, students’ classroom behaviors, as well as surveys obtained from participant teachers, students, and parents. The research questions 1-6 are the following:

1. **Research Question 1**: In the high school setting, do student achievements in each subject taught with the blended learning method of instruction differ from achievements in each subject taught without the blended learning instruction?

2. **Research question 2**: How does the new blended learning model affect teachers’ beliefs about blended instruction and lesson delivery?

3. **Research question 3**: How does the blended method of learning affect students’ beliefs about the e-learning environment in the different components of the blended design: The face-to-face, online experience, and blended learning?

4. **Research question 4**: How does the use of blended instruction affect students’ literacy achievements regarding content subjects’ reading comprehension in terms of the following: Making connections with prior knowledge, visualizing concept and ideas, asking meaningful questions to determine text importance, making inferences, and content synthesis?

5. **Research question 5**: How has the blended methodology of learning influenced students’ engagement, involvement, and motivation towards learning?
6. **Research question 6**: How does the new blended learning methodology bring about a change in parents’ attitude towards their students’ education?

**4.2 Research Question 1:** Do student achievements in each subject taught with the blended learning method of instruction differ from achievements in each subject taught without the blended learning instruction?

**4.2.1 Quantitative Analysis of Grade Performances**

The investigation intended to demonstrate that blended learning, by combining instruction methods from both live face-to-face and online learning experiences, is an effective pedagogical model to help students address affective motivation issues and literacy challenges for reading and writing in content areas. This calls for a pre-test and post-test methodology to assess each student’s performance before and after the program intervention with the experimentation and control group. The *p*-test statistical analysis was used to calculate whether the outcome of the program which used the blended learning model had the level of statistical significance to justify the proposed hypothesis. The statistical package for the Social Sciences (SPSS 22) software for statistical analysis was used to calculate change in students’ scores distribution in the four content subjects at the end of the fall and spring terms. The independent variable is the student achievement on the exams of each subject and the dependent variable is the student score of each subject Test in Term 1 and Term 2. ANOVA tables and Box-Whisker Plots, including various statistical procedures, were used for evaluation and analysis purposes.

The research hypothesis involved several steps: (1) Forming a hypothesis (2) Designing the hypothesis experiment (3) Testing the hypothesis (4) Accepting or rejecting the hypothesis
(6) Reviewing the implications of the hypothesis. This research study hypothesized that students who participated in a blended-designed literacy program targeted to improve affective motivation and cognitive reading comprehension skills show improved performances in English Language Arts and content subjects. The research sample consists of a total of 77 students distributed at grade level 10th, 11th, and 12th in the blended learning (BL) and non-blended learning (Non-BL) program. The grade performances of twelve BL classes were compared with twelve Non-BL grade level classes in English, Social Studies, Math, and Science. Each class had an average of 25 students. Each grade level student participated in four subjects of English, Social Studies, Math, and Science.

In this research study, the researcher conducted a one-way repeated measure analysis of variance (ANOVA) on performance grades of BL and Non-BL students in both Term 1 and Term 2. Using the normality test provided by the SPSS software, the researcher determined that the data have normal distribution. The “Null Hypothesis” was used to test the hypothesis in order to know if grade performances were the results of the use of the blended program, i.e. If $H_0$ is not true, then $H_1$ is true:

Null Hypothesis $H_0$ : Blended program has no effect on grade performance

Hypothesis $H_1$ : Blended program has effects on students’ grade performance

In statistical analysis, the $p$-value is used for testing a statistical hypothesis; it helps the researcher determine the significance of the results. The $p$-value is a number between 0 and 1 and can be understood in the following explanation:

- A small $p$-value ($\leq 0.05$) indicates strong evidence against the null hypothesis, so, the hypothesis is rejected.
• A large $p$-value (>0.05) indicates weak evidence against the null hypothesis (i.e. fail to reject).

• $p$-values very close to the cutoff (~0.05) are considered marginal (uncertain and could go either way)

A $p$-value helps the researcher test the validity of the hypothesis as well as the strength of the hypothesis claim.

The following statistical reports describe the ANOVA data analysis results of the BL and Non-BL classes in each content subject beginning with English, Social Studies, Math, and Science.

4.2.1.1 English Performance Results

The English BL Program grade scores distributed over 10th, 11th, and 12th levels are compared with the Non-BL Program grade scores distributed at the same grade level for Term 1 and Term 2.
ANOVA Analysis of English Term 1 Grade Data Reports:

Table 2: English Term 1 Final Grade Scores in Non-BL and BL Program

<table>
<thead>
<tr>
<th>Enrolled into Blended Program?</th>
<th>Student's Grade Level</th>
<th>Mean</th>
<th>N</th>
<th>Std. Deviation</th>
<th>Median</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>10</td>
<td>73.39</td>
<td>23</td>
<td>10.139</td>
<td>70.00</td>
</tr>
<tr>
<td></td>
<td>11</td>
<td>73.48</td>
<td>25</td>
<td>10.882</td>
<td>75.00</td>
</tr>
<tr>
<td></td>
<td>12</td>
<td>65.28</td>
<td>29</td>
<td>9.238</td>
<td>65.00</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>70.36</td>
<td>77</td>
<td>10.698</td>
<td>70.00</td>
</tr>
<tr>
<td>Yes</td>
<td>10</td>
<td>74.04</td>
<td>23</td>
<td>9.489</td>
<td>75.00</td>
</tr>
<tr>
<td></td>
<td>11</td>
<td>74.33</td>
<td>24</td>
<td>7.446</td>
<td>75.00</td>
</tr>
<tr>
<td></td>
<td>12</td>
<td>69.60</td>
<td>30</td>
<td>10.308</td>
<td>68.50</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>72.40</td>
<td>77</td>
<td>9.406</td>
<td>70.00</td>
</tr>
<tr>
<td>Total</td>
<td>10</td>
<td>73.72</td>
<td>46</td>
<td>9.715</td>
<td>75.00</td>
</tr>
<tr>
<td></td>
<td>11</td>
<td>73.90</td>
<td>49</td>
<td>9.272</td>
<td>75.00</td>
</tr>
<tr>
<td></td>
<td>12</td>
<td>67.47</td>
<td>59</td>
<td>9.954</td>
<td>66.00</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>71.38</td>
<td>154</td>
<td>10.092</td>
<td>70.00</td>
</tr>
</tbody>
</table>

Students who are enrolled into the Blended Learning Program scored higher grades in English Language Arts at the end of Term 1 than those who were not enrolled into the program at each grade level indicated by the ‘Mean’ and ‘Median’ (see Table 2). There were no statistically significant differences in English between BL and Non-BL students observed. (See Box and Whisker Plot Diagram 1)
Nevertheless, there was statistical significance in English in the BL Program with respect to grade level, $P < .001$ (See ANOVA table 3). Students at grade level 10 and 11 scored on average higher than those at grade level 12. (See the following Box Whisker Plot diagram 2)
Diagram 2: Box and Whisker Plot of English Term 1 Final Grade Score by Grade Levels

Table 3: ANOVA Table of English Term1 Final Grade Score Analysis

<table>
<thead>
<tr>
<th></th>
<th>Sum of Squares</th>
<th>Df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>English-Final Grade Term 1</td>
<td>1461.868</td>
<td>2</td>
<td>730.934</td>
<td>7.816</td>
<td>.001</td>
</tr>
<tr>
<td>Student’s Grade Level (Combined)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Between Groups</td>
<td>14120.528</td>
<td>151</td>
<td>93.513</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Within Groups</td>
<td>15582.396</td>
<td>153</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>15582.396</td>
<td>153</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
ANOVA Analysis of English Term 2 Grade Data Report

Table 4: English Term 2 Final Grade Score in Non-BL and BL Program

<table>
<thead>
<tr>
<th>Enrolled into Blended Program</th>
<th>Student’s Grade Level</th>
<th>Mean</th>
<th>N</th>
<th>Std. Deviation</th>
<th>Median</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>10</td>
<td>74.65</td>
<td>23</td>
<td>10.312</td>
<td>75.00</td>
</tr>
<tr>
<td></td>
<td>11</td>
<td>74.32</td>
<td>25</td>
<td>10.375</td>
<td>70.00</td>
</tr>
<tr>
<td></td>
<td>12</td>
<td>69.52</td>
<td>29</td>
<td>7.342</td>
<td>70.00</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>72.61</td>
<td>77</td>
<td>9.513</td>
<td>70.00</td>
</tr>
<tr>
<td>Yes</td>
<td>10</td>
<td>80.78</td>
<td>23</td>
<td>9.322</td>
<td>80.00</td>
</tr>
<tr>
<td></td>
<td>11</td>
<td>84.92</td>
<td>24</td>
<td>6.737</td>
<td>86.50</td>
</tr>
<tr>
<td></td>
<td>12</td>
<td>87.37</td>
<td>30</td>
<td>6.217</td>
<td>87.50</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>84.64</td>
<td>77</td>
<td>7.817</td>
<td>86.00</td>
</tr>
<tr>
<td>Total</td>
<td>10</td>
<td>77.72</td>
<td>46</td>
<td>10.202</td>
<td>77.50</td>
</tr>
<tr>
<td></td>
<td>11</td>
<td>79.51</td>
<td>49</td>
<td>10.208</td>
<td>80.00</td>
</tr>
<tr>
<td></td>
<td>12</td>
<td>78.59</td>
<td>59</td>
<td>11.241</td>
<td>80.00</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>78.62</td>
<td>154</td>
<td>10.569</td>
<td>80.00</td>
</tr>
</tbody>
</table>

There were statistically significant differences in mean scores in English Language Arts for Term 2 observed for students enrolled into the BL Program (Table 4). Those students scored higher grades in English Language Arts at the end of Term 2 than those who were not enrolled into the program, \( P \) value <. 000. (See ANOVA Table 5).

Table 5: ANOVA Analysis of English Term 2 Final Grade Score in BL Program

<table>
<thead>
<tr>
<th></th>
<th>Sum of Squares</th>
<th>Df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>English-Final Grade Term 2 Enrolled into Blended Program? Between (Combined) Groups</td>
<td>5568.026</td>
<td>1</td>
<td>5568.026</td>
<td>73.453</td>
<td>.000</td>
</tr>
<tr>
<td>Within Groups</td>
<td>11522.130</td>
<td>152</td>
<td>75.803</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>17090.156</td>
<td>153</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Diagram 3: Box and Whisker Plot of English Term 2 Final Grade Score of Non-BL and BL Program

There was no statistically significance in scores observed in English Language Arts with respect to grade level at the end of Term 2. Students at grade level 10 on average scored lower than those at grade level 11 and 12. (See Diagram 3, Diagram 4)
Diagram 4: Box and Whisker Plot of English Term 2 Final Grades by Grade Levels
Table 6: ANOVA Analysis of Gains in English from Term 1 to Term 2

<table>
<thead>
<tr>
<th>Enrolled into Blended Program?</th>
<th>Mean</th>
<th>N</th>
<th>Std. Deviation</th>
<th>Median</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>2.2468</td>
<td>77</td>
<td>6.50335</td>
<td>.0000</td>
</tr>
<tr>
<td>Yes</td>
<td>12.2338</td>
<td>77</td>
<td>8.18358</td>
<td>11.0000</td>
</tr>
<tr>
<td>Total</td>
<td>7.2403</td>
<td>154</td>
<td>8.90917</td>
<td>5.0000</td>
</tr>
</tbody>
</table>

The gain analysis showed that the $P$-value of < .000 suggests that the experience of the BL Program has a very positive impact on student’s English Language Arts grade performance (See ANOVA Table 6 and Box Whisker Plot Diagrams 5). The following table shows the Term 2 grade score gains analysis report.

Table 7: ANOVA Analysis of Term 2 Score Gain Analysis Report

<table>
<thead>
<tr>
<th>Gain in English Score Enrolled into Blended Program?</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between (Combined) Groups</td>
<td>3840.006</td>
<td>1</td>
<td>3840.006</td>
<td>70.288</td>
<td>.000</td>
</tr>
<tr>
<td>Within Groups</td>
<td>8304.104</td>
<td>152</td>
<td>54.632</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>12144.110</td>
<td>153</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Diagram 5: Box and Whisker Plot of English Term 2 Score Gain in BL Program

There were statistically significant gains in scores in English Language Arts for students enrolled into the Blended Learning Program. Their gains in scores from Term 1 to the end of Term 2 were more than five times than the gains of students who were not enrolled into the Blended Learning Program as indicated in the (ANOVA Table 7 and Box and Whisker Plot Graph 5).

4.2.1.2 Social Studies Performance Results

ANOVA Analysis of Social Studies Term 1 Grade Data Reports:

The Social Studies BL grade scores distributed over 10th, 11th, and 12th levels are compared with the Non-BL grade scores distributed at the same grade levels for both Term 1 and Term 2.
Social Studies grades of students enrolled into the BL Program at the end of Term 1 did not show statistical significance compared with grades in the Non-BL program; however, those students enrolled in the BL Program scored higher grades at the end of Term 1 than those who were not enrolled into the program. *(Table 8, Diagram 6)*
Diagram 6: Box and Whisker Plot of Social Studies Term 1 Final Grade Score of Non-BL and BL Program

Table 9: ANOVA Table of Social Studies Term 1 Final Grade Score by Grade Level

<table>
<thead>
<tr>
<th>Student's Grade Level</th>
<th>Mean</th>
<th>N</th>
<th>Std. Deviation</th>
<th>Median</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>72.61</td>
<td>46</td>
<td>9.224</td>
<td>70.00</td>
</tr>
<tr>
<td>11</td>
<td>74.67</td>
<td>49</td>
<td>8.179</td>
<td>75.00</td>
</tr>
<tr>
<td>12</td>
<td>69.90</td>
<td>59</td>
<td>12.017</td>
<td>68.00</td>
</tr>
<tr>
<td>Total</td>
<td>72.23</td>
<td>154</td>
<td>10.237</td>
<td>70.00</td>
</tr>
</tbody>
</table>

There were no statistically significant differences in scores observed in Social Studies with respect to grade level, however, students at grade level 12 on average scored lower than those at grade level 11 and 10 as indicated in Table 9 and Diagram 7.
Diagram 7: Box and Whisker Plot Social Studies Term 1 Final Grade Score by Grade Level
ANOVA Analysis of Social Studies Term 2 Grade Score Data Reports:

Table 10: Social Studies Term 2 Final Grade Score in Non-BL and BL Program

<table>
<thead>
<tr>
<th>Enrolled into Blended Program?</th>
<th>Student's Grade Level</th>
<th>Mean</th>
<th>N</th>
<th>Std. Deviation</th>
<th>Median</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>10</td>
<td>71.35</td>
<td>23</td>
<td>8.227</td>
<td>70.00</td>
</tr>
<tr>
<td></td>
<td>11</td>
<td>75.40</td>
<td>25</td>
<td>11.708</td>
<td>75.00</td>
</tr>
<tr>
<td></td>
<td>12</td>
<td>68.66</td>
<td>29</td>
<td>13.251</td>
<td>67.00</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>71.65</td>
<td>77</td>
<td>11.647</td>
<td>70.00</td>
</tr>
<tr>
<td>Yes</td>
<td>10</td>
<td>80.52</td>
<td>23</td>
<td>6.960</td>
<td>80.00</td>
</tr>
<tr>
<td></td>
<td>11</td>
<td>85.50</td>
<td>24</td>
<td>5.603</td>
<td>85.50</td>
</tr>
<tr>
<td></td>
<td>12</td>
<td>86.40</td>
<td>30</td>
<td>7.393</td>
<td>86.50</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>84.36</td>
<td>77</td>
<td>7.134</td>
<td>85.00</td>
</tr>
<tr>
<td>Total</td>
<td>10</td>
<td>75.93</td>
<td>46</td>
<td>8.848</td>
<td>75.00</td>
</tr>
<tr>
<td></td>
<td>11</td>
<td>80.35</td>
<td>49</td>
<td>10.469</td>
<td>82.00</td>
</tr>
<tr>
<td></td>
<td>12</td>
<td>77.68</td>
<td>59</td>
<td>13.862</td>
<td>80.00</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>78.01</td>
<td>154</td>
<td>11.547</td>
<td>80.00</td>
</tr>
</tbody>
</table>

Table 11: ANOVA Analysis of Social Studies Term 2 Final Grade Score in BL Program

<table>
<thead>
<tr>
<th>Social Studies-Final Grade Term 2 Enrolled into Blended Program?</th>
<th>Sum of Squares</th>
<th>Df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Group (Combined)</td>
<td>6223.643</td>
<td>1</td>
<td>6223.643</td>
<td>66.726</td>
<td>.000</td>
</tr>
<tr>
<td>Within Groups</td>
<td>14177.351</td>
<td>152</td>
<td>93.272</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>20400.994</td>
<td>153</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
As students entered into Term 2 improvements became apparent in the Social Studies classes. Social Studies grades of students enrolled into the Blended Learning Program at the end of Term 2 showed statistical significances from grades of students who were not enrolled into the program. The means and standard deviations of the tests that are presented in the ANOVA TABLE indicated significant increase in Social Studies Achievements on the final term grades, showing $P$-value $< .000$. (See ANOVA Table 10, 11)
Diagram 8: Box and Whisker Plot of Social Studies Term 2 Final Grade Score between Non-BL and BL Program

Table 12: ANOVA Analysis of Score Gains in Social Studies from Term 1 to Term 2

<table>
<thead>
<tr>
<th>Enrolled into Blended Program?</th>
<th>Mean</th>
<th>N</th>
<th>Std. Deviation</th>
<th>Median</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>.9091</td>
<td>77</td>
<td>6.08964</td>
<td>.0000</td>
</tr>
<tr>
<td>Yes</td>
<td>10.6494</td>
<td>77</td>
<td>9.19921</td>
<td>10.0000</td>
</tr>
<tr>
<td>Total</td>
<td>5.7792</td>
<td>154</td>
<td>9.18314</td>
<td>3.0000</td>
</tr>
</tbody>
</table>
There were statistically significant gains in scores in Social Studies for the students enrolled into the Blended Program, $P$-value $< .000$. The score gains of BL students from Term 1 to the end of Term 2 were ten times more than the score gains of student who were not enrolled into the Blended Program. (Diagram 8, ANOVA Table 12, 13)

**Table 13: ANOVA Table of Social Studies Term 2 Score Gains Analysis Report in BL Program**

<table>
<thead>
<tr>
<th></th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gain in Social Studies Score Enrolled into Blended Program?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Between (Combined) Groups</td>
<td>3652.597</td>
<td>1</td>
<td>3652.597</td>
<td>60.022</td>
<td>.000</td>
</tr>
<tr>
<td>Within Groups</td>
<td>9249.896</td>
<td>152</td>
<td>60.855</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>12902.494</td>
<td>153</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Diagram 9: Box and Whisker Plot of Social Studies Term 2 Score Gains in BL Program

The data indicated in the above figure shows that the test scores obtained by students who enrolled in the BL Program were higher than test scores obtained from students who were in the Non-BL Program. In the Non-BL program, there were many cases of low grades distributed in the lower rank. In the BL program, student grades are clustered close to the median range. As mentioned already, test scores gain of BL students are more than ten times higher than those who did not enroll into the BL Program. (See Table 12, Table 13, and Diagram 9)

4.2.1.3 Mathematics Performance Results

The Math BL grade scores distributed over 10th, 11th, and 12th grade levels are compared with the Non-BL classes distributed at the same grade levels for both Term 1 and Term 2.
ANOVA ANALYSIS of Mathematics Term 1 Grade Data Reports:

Table 14: Mathematic Term 1 Final Grade Score in Non-BL and BL Program

<table>
<thead>
<tr>
<th>Enrolled into Blended Program?</th>
<th>Student’s Grade Level</th>
<th>Mean</th>
<th>N</th>
<th>Std. Deviation</th>
<th>Median</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>10</td>
<td>69.61</td>
<td>23</td>
<td>9.341</td>
<td>70.00</td>
</tr>
<tr>
<td></td>
<td>11</td>
<td>70.12</td>
<td>25</td>
<td>10.997</td>
<td>70.00</td>
</tr>
<tr>
<td></td>
<td>12</td>
<td>68.93</td>
<td>29</td>
<td>9.691</td>
<td>65.00</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>69.52</td>
<td>77</td>
<td>9.915</td>
<td>68.00</td>
</tr>
<tr>
<td>Yes</td>
<td>10</td>
<td>69.43</td>
<td>23</td>
<td>10.816</td>
<td>68.00</td>
</tr>
<tr>
<td></td>
<td>11</td>
<td>66.33</td>
<td>24</td>
<td>9.490</td>
<td>65.00</td>
</tr>
<tr>
<td></td>
<td>12</td>
<td>67.00</td>
<td>30</td>
<td>9.638</td>
<td>66.50</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>67.52</td>
<td>77</td>
<td>9.911</td>
<td>65.00</td>
</tr>
<tr>
<td>Total</td>
<td>10</td>
<td>69.52</td>
<td>46</td>
<td>9.993</td>
<td>68.00</td>
</tr>
<tr>
<td></td>
<td>11</td>
<td>68.27</td>
<td>49</td>
<td>10.358</td>
<td>68.00</td>
</tr>
<tr>
<td></td>
<td>12</td>
<td>67.95</td>
<td>59</td>
<td>9.630</td>
<td>65.00</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>68.52</td>
<td>154</td>
<td>9.931</td>
<td>68.00</td>
</tr>
</tbody>
</table>

Mathematics grades of students enrolled into BL Program at the end of Term 1 did not differ significantly from grades of students in the Non-BL Program. Those students enrolled into the BL Program scored lower grades in Mathematics at the end of Term 1 than those who were not enrolled into the program. (Table 14, See Diagram 10, Diagram 11)
Diagram 10: Box and Whisker Plot of Math Term 1 Final Grade Score in Non-BL and BL Program
There were no statistically significant differences in scores observed in Mathematics with respect to grade levels at the end of Term 1. Students at grade level 10 on average scored higher than those at grade levels 11 and 12. (ANOVA Table 15, Diagram 10 and 11)
**ANOVA Analysis of Mathematics Term 2 Grade Score Data Reports:**

Term 2 grades showed significant improvements in the BL program over the No BL program in terms of grade scores. There is also marked grade achievement at grade level comparison between Term 1 and Term 2. *(See ANOVA Table 16, 17)*

**Table 16: Mathematics Term 2 Final Grade Score in Non-BL Program and BL Program**

<table>
<thead>
<tr>
<th>Enrolled into Blended Program?</th>
<th>Student's Grade Level</th>
<th>Mean</th>
<th>N</th>
<th>Std. Deviation</th>
<th>Median</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>10</td>
<td>69.00</td>
<td>23</td>
<td>9.691</td>
<td>70.00</td>
</tr>
<tr>
<td></td>
<td>11</td>
<td>72.20</td>
<td>25</td>
<td>7.053</td>
<td>70.00</td>
</tr>
<tr>
<td></td>
<td>12</td>
<td>69.72</td>
<td>29</td>
<td>11.039</td>
<td>67.00</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>70.31</td>
<td>77</td>
<td>9.466</td>
<td>70.00</td>
</tr>
<tr>
<td>Yes</td>
<td>10</td>
<td>79.43</td>
<td>23</td>
<td>8.522</td>
<td>80.00</td>
</tr>
<tr>
<td></td>
<td>11</td>
<td>77.38</td>
<td>24</td>
<td>7.660</td>
<td>78.50</td>
</tr>
<tr>
<td></td>
<td>12</td>
<td>84.00</td>
<td>30</td>
<td>8.204</td>
<td>85.00</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>80.57</td>
<td>77</td>
<td>8.528</td>
<td>80.00</td>
</tr>
<tr>
<td>Total</td>
<td>10</td>
<td>74.22</td>
<td>46</td>
<td>10.452</td>
<td>75.00</td>
</tr>
<tr>
<td></td>
<td>11</td>
<td>74.73</td>
<td>49</td>
<td>7.735</td>
<td>75.00</td>
</tr>
<tr>
<td></td>
<td>12</td>
<td>76.98</td>
<td>59</td>
<td>12.012</td>
<td>78.00</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>75.44</td>
<td>154</td>
<td>10.350</td>
<td>75.00</td>
</tr>
</tbody>
</table>
Table 17: ANOVA Analysis of Math Term 2 Grade Score in BL Program

<table>
<thead>
<tr>
<th>Mathematics-Final Grade Term 2 Enrolled into Blended Program?</th>
<th>Sum of Squares</th>
<th>Df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups (Combined)</td>
<td>4052.597</td>
<td>1</td>
<td>4052.597</td>
<td>49.929</td>
<td>.000</td>
</tr>
<tr>
<td>Within Groups</td>
<td>12337.377</td>
<td>152</td>
<td>81.167</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>16389.974</td>
<td>153</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Mathematics grades of students enrolled into the Blended Program at the end of Term 2 differed significantly from grades of students who were not enrolled into the Blended Program.

BL Program p-value < .000 (ANOVA Table 16 and 17, Diagram 12)
Diagram 12: Box and Whisker Plot of Math Term 2 Final Grade Score between Non-BL and BL Program
Table 18: ANOVA Analysis of Gains in Mathematics Grades from Term 1 to Term 2

Mathematics Gain Score Report

<table>
<thead>
<tr>
<th>Enrolled into Blended Program?</th>
<th>Mean</th>
<th>N</th>
<th>Std. Deviation</th>
<th>Median</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>.7922</td>
<td>77</td>
<td>10.21008</td>
<td>.0000</td>
</tr>
<tr>
<td>Yes</td>
<td>13.0519</td>
<td>77</td>
<td>7.85543</td>
<td>13.0000</td>
</tr>
<tr>
<td>Total</td>
<td>6.9221</td>
<td>154</td>
<td>10.96610</td>
<td>6.5000</td>
</tr>
</tbody>
</table>

Table 19: ANOVA Table of Mathematics Term 2 Gains Analysis Report

<table>
<thead>
<tr>
<th>Mathematics Gain Score Enrolled into Blended Program</th>
<th>Sum of Squares</th>
<th>Df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups (Combined)</td>
<td>5786.597</td>
<td>1</td>
<td>5786.597</td>
<td>69.738</td>
<td>.000</td>
</tr>
<tr>
<td>Within Groups</td>
<td>12612.468</td>
<td>152</td>
<td>82.977</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>18399.065</td>
<td>153</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

There were statistically significant gains in scores in Mathematics for students enrolled into the Blended Program in Term 2. A close examination of Math gain score of the students in the BL Program was sixteen times higher than the grades of students in the Non-BL Program in Term 2 as indicated in the ANOVA Table, $P < .000$ (ANOVA Table 18, 19, and Diagram 12, 13)
Diagram 13: Box Whisker Plot of Mathematics Term 2 Score Gains of BL Program
4.2.1.4 Science Performance Results

The Science BL grade scores distributed over 10th, 11th, and 12th grade levels are compared with the Non-BL grade scores distributed at the same grade level for both Term 1 and Term 2.

Table 20: ANOVA Analysis of Science Term 1 Grade Score Data Report

<table>
<thead>
<tr>
<th>Enrolled into Blended Program?</th>
<th>Student's Grade Level</th>
<th>Mean</th>
<th>N</th>
<th>Std. Deviation</th>
<th>Median</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>10</td>
<td>69.83</td>
<td>23</td>
<td>8.211</td>
<td>65.00</td>
</tr>
<tr>
<td></td>
<td>11</td>
<td>73.56</td>
<td>25</td>
<td>9.891</td>
<td>75.00</td>
</tr>
<tr>
<td></td>
<td>12</td>
<td>69.55</td>
<td>29</td>
<td>9.694</td>
<td>69.00</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>70.94</td>
<td>77</td>
<td>9.402</td>
<td>70.00</td>
</tr>
<tr>
<td>Yes</td>
<td>10</td>
<td>73.04</td>
<td>23</td>
<td>9.865</td>
<td>71.00</td>
</tr>
<tr>
<td></td>
<td>11</td>
<td>72.67</td>
<td>24</td>
<td>9.309</td>
<td>72.50</td>
</tr>
<tr>
<td></td>
<td>12</td>
<td>66.77</td>
<td>30</td>
<td>9.231</td>
<td>65.00</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>70.48</td>
<td>77</td>
<td>9.791</td>
<td>70.00</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>10</td>
<td>71.43</td>
<td>46</td>
<td>9.121</td>
<td>69.00</td>
</tr>
<tr>
<td></td>
<td>11</td>
<td>73.12</td>
<td>49</td>
<td>9.521</td>
<td>73.00</td>
</tr>
<tr>
<td></td>
<td>12</td>
<td>68.14</td>
<td>59</td>
<td>9.484</td>
<td>68.00</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>70.71</td>
<td>154</td>
<td>9.570</td>
<td>70.00</td>
</tr>
</tbody>
</table>

Only the 10th grade Science students enrolled into the Blended Program scored higher than those students who did not enroll into the program at the end of Term 1. The 11th and 12th grade students enrolled into the Blended Program scored lower at the end of Term 1 than students not enrolled into the program. (See ANOVA Table 20)
Table 21: ANOVA Table of Science Term 1 Final Grade Score by Grade Level

<table>
<thead>
<tr>
<th>Student’s Grade Level</th>
<th>Mean</th>
<th>N</th>
<th>Std. Deviation</th>
<th>Median</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>71.43</td>
<td>46</td>
<td>9.121</td>
<td>69.00</td>
</tr>
<tr>
<td>11</td>
<td>73.12</td>
<td>49</td>
<td>9.521</td>
<td>73.00</td>
</tr>
<tr>
<td>12</td>
<td>68.14</td>
<td>59</td>
<td>9.484</td>
<td>68.00</td>
</tr>
<tr>
<td>Total</td>
<td>70.71</td>
<td>154</td>
<td>9.570</td>
<td>70.00</td>
</tr>
</tbody>
</table>

Table 22: ANOVA Analysis of Science Term 1 Final Grade Score in BL Program

<table>
<thead>
<tr>
<th></th>
<th>Sum of Squares</th>
<th>Df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Science Final Grade Term 1 Student’s Grade Level</td>
<td>Between (Combined) Groups</td>
<td>700.366</td>
<td>2</td>
<td>350.183</td>
<td>3.972</td>
</tr>
<tr>
<td></td>
<td>Within Groups</td>
<td>13311.485</td>
<td>151</td>
<td>88.156</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>14011.851</td>
<td>153</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

There were statistically significant differences in scores observed in Science with respect to grade level at the end of Term 1, $P < .021$. When comparing BL and Non-BL students according to grade level, the BL 10th grade students performed better than the Non-BL 10th grade students, however, both 11th and 12th grade BL students performed lower than the students in the Non-BL Program. (ANOVA Table 21 and 22 and following Diagram 14 and 15)
Diagram 14: Box and Whisker Plot of Science Term 1 Final Grade Score in Non-BL and BL
Diagram 15: Box and Whisker Plot of Science Term 1 Final Grade Score by Grade Levels
## ANOVA Analysis of Science Term 2 Grade Data Reports

### Table 23: Science Term 2 Final Grade Score in Non-BL and BL Program

<table>
<thead>
<tr>
<th>Student's Grade Level</th>
<th>Mean</th>
<th>N</th>
<th>Std. Deviation</th>
<th>Median</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>70.65</td>
<td>23</td>
<td>8.553</td>
<td>68.00</td>
</tr>
<tr>
<td>11</td>
<td>74.12</td>
<td>25</td>
<td>9.812</td>
<td>75.00</td>
</tr>
<tr>
<td>12</td>
<td>70.34</td>
<td>29</td>
<td>9.810</td>
<td>71.00</td>
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<tr>
<td>Total</td>
<td>71.66</td>
<td>77</td>
<td>9.486</td>
<td>71.00</td>
</tr>
<tr>
<td>Yes</td>
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<tr>
<td>10</td>
<td>79.83</td>
<td>23</td>
<td>9.604</td>
<td>83.00</td>
</tr>
<tr>
<td>11</td>
<td>79.21</td>
<td>24</td>
<td>8.797</td>
<td>79.00</td>
</tr>
<tr>
<td>12</td>
<td>83.67</td>
<td>30</td>
<td>8.384</td>
<td>85.00</td>
</tr>
<tr>
<td>Total</td>
<td>81.13</td>
<td>77</td>
<td>9.009</td>
<td>83.00</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>75.24</td>
<td>46</td>
<td>10.117</td>
<td>74.00</td>
</tr>
<tr>
<td>11</td>
<td>76.61</td>
<td>49</td>
<td>9.583</td>
<td>75.00</td>
</tr>
<tr>
<td>12</td>
<td>77.12</td>
<td>59</td>
<td>11.257</td>
<td>80.00</td>
</tr>
<tr>
<td>Total</td>
<td>76.40</td>
<td>154</td>
<td>10.372</td>
<td>75.00</td>
</tr>
</tbody>
</table>

### Table 24: ANOVA Analysis of Science Term 2 Final Grade Score of BL Program

<table>
<thead>
<tr>
<th>Science-Final Grade Term 2 Enrolled into Blended Program?</th>
<th>Sum of Squares</th>
<th>Df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups (Combined)</td>
<td>3450.916</td>
<td>1</td>
<td>3450.916</td>
<td>40.325</td>
<td>.000</td>
</tr>
<tr>
<td>Within Groups</td>
<td>13007.922</td>
<td>152</td>
<td>85.578</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>16458.838</td>
<td>153</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Science grades of students enrolled into Blended Learning Program at the end of Term 2 differed significantly from grades of students who were not enrolled into the Blended Learning Program. BL programs $p$-value < .000. (ANOVA Table 23 and 24)

Diagram 16: Box and Whisker Plot of Science Term 2 Final Grade Score between Non-BL and BL Program

The analysis of Science score gains in Term 2 showed a statistically significance of $p$-value < .000. The score gains from Term 1 to the end of Term 2 in the BL Program were more than fourteen times the score gains of students who were not enrolled into the BL Program. (ANOVA Table 25, 26, and Diagram 16, and 17)
Table 25: ANOVA Analysis of Gains in Science from Term 1 to Term 2

<table>
<thead>
<tr>
<th>Enrolled into Blended Program?</th>
<th>Mean</th>
<th>N</th>
<th>Std. Deviation</th>
<th>Median</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>.7273</td>
<td>77</td>
<td>6.88942</td>
<td>.0000</td>
</tr>
<tr>
<td>Yes</td>
<td>10.6494</td>
<td>77</td>
<td>9.63651</td>
<td>7.0000</td>
</tr>
<tr>
<td>Total</td>
<td>5.6883</td>
<td>154</td>
<td>9.71995</td>
<td>3.0000</td>
</tr>
</tbody>
</table>

Table 26: ANOVA Table of Science Term 2 Score Gains Analysis Report

<table>
<thead>
<tr>
<th></th>
<th>Sum of Squares</th>
<th>Df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gain in Science Score</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Enrolled into Blended</td>
<td>3790.234</td>
<td>1</td>
<td>3790.234</td>
<td>54.020</td>
<td>.000</td>
</tr>
<tr>
<td>Program?</td>
<td>10664.805</td>
<td>152</td>
<td>70.163</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>14455.039</td>
<td>153</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
After an extensive analysis of the quantitative data of student academic performances in the four core subjects, the research findings concluded that students’ performance progress using Blended Learning Methodology was positively related to student achievements in every subject. Seventy-seven participant students demonstrated a remarkable performance record, showed achievement gains of ten to sixteen times, and statistical significance of $p$-value < .000, in every subject at the end of the school year 2013-2014. Students demonstrated significantly better on overall mean scores in Term 2 over Term 1 as both teachers and students gained
proficiency in the use of the Blended Learning model. The following table summarized the ANOVA analysis gains in English, Social Studies, Math, and Science between term 1 and term 2.

Table 27: Summary of ANOVA Analysis of Gains in Four Core Subjects Term 1 to Term 2

<table>
<thead>
<tr>
<th>Subject Report</th>
<th>Mean</th>
<th>N</th>
<th>Std. Deviation</th>
<th>Median</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>English Gain Scores Report</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-blended Classes</td>
<td>2.2468</td>
<td>77</td>
<td>6.50335</td>
<td>.0000</td>
</tr>
<tr>
<td>Blended Classes</td>
<td>12.2338</td>
<td>77</td>
<td>8.18358</td>
<td>11.0000</td>
</tr>
<tr>
<td>Total</td>
<td>7.2403</td>
<td>154</td>
<td>8.90917</td>
<td>5.0000</td>
</tr>
<tr>
<td><strong>Social Studies Gain Scores Report</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-blended Classes</td>
<td>.9091</td>
<td>77</td>
<td>6.08964</td>
<td>.0000</td>
</tr>
<tr>
<td>Blended Classes</td>
<td>10.6494</td>
<td>77</td>
<td>9.19921</td>
<td>10.0000</td>
</tr>
<tr>
<td>Total</td>
<td>5.7792</td>
<td>154</td>
<td>9.18314</td>
<td>3.0000</td>
</tr>
<tr>
<td><strong>Mathematics Gain Scores Report</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-blended Classes</td>
<td>.7922</td>
<td>77</td>
<td>10.21008</td>
<td>.0000</td>
</tr>
<tr>
<td>Blended Classes</td>
<td>13.0519</td>
<td>77</td>
<td>7.85543</td>
<td>13.0000</td>
</tr>
<tr>
<td>Total</td>
<td>6.9221</td>
<td>154</td>
<td>10.96610</td>
<td>6.5000</td>
</tr>
<tr>
<td><strong>Science Gain Scores Report</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-blended Classes</td>
<td>.7273</td>
<td>77</td>
<td>6.88942</td>
<td>.0000</td>
</tr>
<tr>
<td>Blended Classes</td>
<td>10.6494</td>
<td>77</td>
<td>9.63651</td>
<td>7.0000</td>
</tr>
<tr>
<td>Total</td>
<td>5.6883</td>
<td>154</td>
<td>9.71995</td>
<td>3.0000</td>
</tr>
</tbody>
</table>

It can be calculated from the mean scores of the four subjects (Table 27) between BL and Non-BL that the rate of growth of BL from Term 1 to Term 2 is approximately 5 times in English, 11 times in Social Studies, 14 times in Science, and 16 times in Math.

4.3 Research Question 2: How does the new blended learning model affect teachers’ beliefs about blended instruction and lesson delivery?

The results generated from these quantitative findings are supported by the qualitative data generated by the personal interviews and classroom observations, as well as the post-
interview questionnaires survey conducted with teachers, students, and parents. The qualitative approach was used to collect the following data:

1. Surveys were given to teachers and students to gain information on their perceptions of the blended model before and after implementation.
2. Teachers were interviewed regarding their instruction experiences.
3. Students were interviewed regarding their learning experiences.
4. Parents were interviewed to obtain information about the program and were given the choice of continuing their child’s enrollment in the course.
5. Frequent classroom visits were made in the face-to-face and online classes.

4.3.1 Teachers’ Interview Findings

The qualitative data were gathered through several data entry points: Participant teachers’ departmental and personal interviews, students’ interviews and their classroom activities. One of the advantages of the qualitative research methodology is that it provides answers to what, why, and how the research is going to be investigated and developed (Ref. Section 3.2). The researcher’s interview questions were guided by four themes: (1) To find out about the teachers’ beliefs and attitudes regarding the incorporation of a literacy program within the students’ curriculum to achieve content literacy by using the BL instruction. (2) To learn about the impact of BL on teacher pedagogy, student learning, teacher-student interaction, and student engagement and motivation. (3) To learn about students’ perceptions about and preferences for the BL platform and environment. (4) To understand more deeply parents’ attitude towards their children’s education and their opinions on the new BL methods of
instruction. The interview questions are found in Section 3.8.3, 3.8.4. The teachers’ interviews findings were categorized into four themes:

**Theme 1: Teachers’ belief and attitude towards the blended learning literacy program.**

The following are some highlights recorded from the interviews. Several English teachers thought that literacy should be taught throughout the high school years in order to prepare students for college work and their future careers.

**Interviewer:** Why do you think that Literacy is important to students in all subjects?

**English teacher (E3):**

“I think there is a literacy crisis, not only among lower grade students, but also among adolescents. The problem is that many high school students do not have the literacy skills to read more complex literature or write their thoughts using the appropriate academic language. High school literature contents are more challenging than lower grades’ literature because they often require a higher level of reading strategies and skills to comprehend a portion of a text passage. There is a deep problem if students don’t understand what they are reading before they go to college.”

Some teachers believed that developing reading strategies and helping students to apply these strategies in all subjects are keys to student success. The interviewer pursued this point further by asking the following:

**Interviewer:** Why do you think reading with fluency is important for all subjects?
English teacher (E2):

“If student is not reading the words with fluency and understanding of what the author is trying to convey, then the student will be unable to comprehend the message contained in the book...not only in reading English literature, but also be able to apply reading strategies learned in the English classroom to other subject classes such as math, science, history, etc. I consider it absolutely necessary to have a simple but well-planned literacy program because literacy demands are rapidly increasing within our current global environment.”

Interviewer: Do you see that BL can be useful for supporting literacy achievement?

10th grade English teacher commented:

“Blended Learning is a useful tool to improve literacy skills. There are plenty of reading materials online for reading practice. Teachers can add or delete links in the digital curriculum. The more students read, the faster they will improve in their ability to read with fluency. A teacher-designed digital curriculum creates flexibilities and choices” (10th grade English teacher).

Another 11th grade participant teacher had this to say:

“I used to think that live instruction could happen only in the face-to-face classroom. Not so anymore. I could equally enjoy the live instruction I received from a professional development opportunity via Webinar.” (English teacher)

English teacher (E1):

“With the advancement of technology and the rapid globalization of all cultures, it’s time for us to realize that students need advance literacy in all the classrooms and in the
workplace if they are to get a good education and good job. We need a lot of reading daily wherever we are. We have to understand well what we read with fluency and accuracy.”

**Interviewer:** Are you in favor of incorporating a literacy program in a BL model for improving content proficiency?

**Advanced Algebra teacher (M2):**

“I am convinced that BL gives me a unique way to express my math instruction, which is more effective than just the traditional way. I visited the Geometry teacher and saw students using the Sketch Pad program extensively in the OL Lab. There are many resources in the Web and a lot of tutorial trainings offered online. The more resources there are, the better students learn. BL is practical, pragmatic and convenient for teachers to teach and students to learn.”

**Biology teacher (S1):**

“I feel that BL can work for me if I learn how to use it well. Technology is going to be more and more a definite and specific part of my teaching. I use the PowerPoint every day. I use it as a Warm-Up exercise before I proceed to the lesson of the day. My students love it. It helps them to connect with what they learned the day before. They love it when they have time on their own to explore. The downside of it is that students can get carried away and start doing other stuff like Facebook activities in the class. I believe the lab activities have to be very well structured and students need to be supervised. BL offers a system for me to work with students and go over difficult problems together.”
Theme 2: Teacher’s Belief about Pedagogy, Curriculum Design, and Student Learning

Many teachers expressed that the introduction of a BL platform offers alternative and innovative ways for teachers to organize their time and improve the instruction and learning processes. Students increase learning opportunities not only in the traditional classroom but can extend and continue learning outside of the classroom setting.

Interviewer: How do you compare FTF, OL, and BL models of instruction and learning?

The Economics teacher (H3):

“I strongly believe that the online component of BL is a tremendous learning tool for studying economic concepts. The economics concepts cannot be comprehended simply by listening to lectures or by memorizing facts and information. One has to understand the causes and effects and their relationships. On-line opportunities are great learning resources for students to extract information from a variety of resources anytime and anywhere, when they are in schools, at home, or in the street.”

Math teacher (M1):

“When students go to the computer lab, they should be well disposed to explore on their own, and have already good background knowledge of what they have already learned in class, and then be on their own in applying the theories to practical applications....” “I like the fact that computer-mediated assignments call for hands-on practices because they enhance the understanding of the concepts and ideas taught in the FTF instruction.”

12th grade Calculus teacher (M3):

“In the English classroom, reading and writing are common tasks. In a math classroom, there is less reading and writing, but the accurate understanding of the meaning of each
word is so important for solving every problem. Especially in Calculus, students need to acquire a higher level of reading skills. Literacy proficiency is absolutely needed for advanced math reading and writing. The advantage of the BL method is that the Course Site incorporates the Subject-Specific Vocabulary support embedded in the digital curriculum.”

**History teacher (H2):**

The American History teacher was doubtful how BL could support him in teaching history in the first term.

“BL has two sides to it. In a FTF situation, there is the body language and eye contact communication that gives me a chance to address a student’s concern, especially for the English Language Learners who aren’t necessarily able to articulate their needs verbally or in writing. In the OL setting, students have more time to explore and are not intimated by the presence of a teacher.”

**Chemistry teacher (S2):**

“My knowledge of BL is superficial and shallow at the beginning. In Chemistry, I have to deal with many formulas, symbols and diagrams. I don’t find it easy to create a Chemistry outline and upload it to the web. In the FTF classroom students can ask me questions and receive my immediate replies regarding specific instructions and notes. I am beginning to appreciate the OL composite because the digital curriculum gives structure for students to organize and synthesize their learning. They learn to ask meaningful questions after they have read enough of the OL resources related to the day’s topic.”
Economics teacher (H3):

“Economics texts contain fewer text clues and often contain abstract concepts that students have to learn first before understanding them. For example, the word like ‘Capital Gain’ has specific meanings that are meant to express a particular concept. Incorporating a literacy program into the content curriculum is a great support to history teachers. I see the advantages of using ‘flipped’ strategies. This way of learning makes it possible for global connections and adding rich resources to course content, which is important for the study of Economics. I am opened to this innovative way of teaching.”

Interviewer: Many teachers believe that the Course Site offers extensive supports for learning subject-specific vocabulary and for densely factual materials in non-humanities classes. What are your opinions on these points?

Teacher (H1):

“Literacy is very important in a World History class. Literacy helps students build literacy knowledge and skills through the learning activities section of the digital curriculum in the Course Web. The FTF gives the personal touch and guidance that are absent in the OL situations. On the other hand, OL supports learner-center environments, independent exercises, and collaboration among learners.”

Theme 3: Teacher’s Role in the BL Program

Several teachers indicated that while technology is important, the role of teachers in the teaching and learning process had not diminished but rather had increased.
Interviewer: Do you believe that BL changes the role of the teacher in the student’s learning process?

**English teacher (E3):** “I believe teachers remain and continue to play the key role as change agents for student engagement and motivation.”

**Physics teacher (S3):**

“I am taking a BL Differential Equation OL course right now at the OL University. Personally, I’d rather have more FTF class time than On-line time. The personal contact is important to me when I have questions that need to be clarified immediately before I can continue to the next chapter. I am a bit skeptical at this point whether students can really learn the content materials in a BL situation when they have so much content to cover. The real teacher-student interaction moments are important for high school students.”

**Advanced Algebra teacher (M2):**

“A teacher’s pedagogical approach and how he or she teaches in the classroom is based on a teacher’s perception of learning and of how students can learn best. I look at my students’ needs first and then I try to modify my delivery method accordingly.”

**Theme 4:** Teacher’s Perception in BL for Teaching the Six-Reading Comprehension Strategies: Make Connections, Questioning, Visualizing and Inferring, Determining Importance in Text, Synthesizing Information, and Strategy Instruction in Text.

Interviewer: Many teachers believe that ‘Flipping the classroom’ helps teachers to make connections between FTF and OL learning. What are your experiences on connecting FTF and On-Line instruction?
**12th grade English teacher (E3):**

“‘Flipping the classroom is an excellent strategy in applying Bloom’s Taxonomy in working on reading assignments. I ask students to visit several video links or the Wiki before class to gather information and knowledge on the assigned reading. This outside class activity provides students opportunities of first exposure to the new materials. When they come to class next day, most of them are better prepared and exposed to discuss, assimilate, and analyze the assigned piece of literature reading. In other words, they are performing the lower levels of remembering and acquiring knowledge within the Bloom’s Taxonomy scheme outside of class time. Teachers then use class time for focusing on the next steps of the Taxonomy: Deeper understanding, analyzing, evaluating, and creating.”

**10th grade English teacher (E1):**

“Using the flipping classroom technique for creating “First exposure” prior to class is a great advantage of hybrid learning. If I ask my class students to prepare the reading from a textbook, only the self-driven students would do the reading ahead of time. But if I ask the class to do it OL, write a brief critique about the article, and print it, and bring to class for discussion, then everyone feels he or she is responsible for his or her contribution to the class’s ‘productive time’.”

**10th grade English teacher:**

“My class begins with a 15-minute reading exercise each day. I flip to NEWSELA web site in the Warm Up part of the lesson. Students access the same reading article through their iPads. It is a great web resource to build reading comprehension with nonfiction through
daily practice. It’s noticeable that this everyday exercise helps my students improve their grades throughout the term.”

10th grade English teacher:

“BL is supreme for scaffolding a reading lesson. I use scaffolding techniques and online tools support in each of the scaffolding steps. There are many ways to scaffold a piece of reading. I launch the lesson by tapping into students’ prior knowledge, asking students to share their own experiences and ideas, and then have them connect the ideas discussed in class to their own experiences. I usually pre-teach the vocabularies via my online video before the students come to class. In class, I use the graphic organizer to develop the lesson, and help them dive into the discussion part. I break up the lessons into small pieces: preview the text, explain and discuss key vocabulary, chunk complex text into small pieces, make references to online resources along with explanation and discussions. Throughout the process, I use flipping strategies to include online resources. I find a very effective way of scaffolding the lesson is to assign students to research topical information such as cultural beliefs, custom norms, historical background of the story, and read about the author of the book, or article from the web. Then I ask students to connect the author’s background and experiences to the ideas in that text. There is more fun in the learning process.”

11th grade English teacher:

“I model reading skills in the class and then ask my students to find a practice exam online to practice on their own. These are the steps I follow: Make current text connections with the text they read previously; make text connections with world events; and make text
connections with their personal experiences. Students can practice on their own with any of the reading lists I posted online. Students can choose from the different lists according to their grade level. In my class, almost every student improved in the quality of learning, and achieved a better grade average in the 2nd term.”

12th Grade English teacher:

“The best strategy I experienced in my class is to divide the reading task into three parts: pre-reading, reading, and post-reading. The pre-reading is the online assignment task each one must accomplish before coming to class. The pre-reading task consists of collecting and defining the vocabulary ahead of the class meeting. Having student pre-read the assignments prepared them better to answer questions about literary elements in the text. They are usually given a list of questions to assist their pre-reading. My post-reading strategy is modeling for my students how to summarize the main themes of the content. Each week students are assigned to self-evaluate themselves using the end of chapter quiz in the course template.”

12th grade Calculus teacher:

“Recently I started making a collection of short videos on topics that students needed extra help with. I posted these videos online. Students could access them anytime they want and watch my teaching via videos at home. Students think it’s cool to study without textbooks. Learning is fun and not boring anymore. Their math skills and grades improved at the end of the term.”
11th grade English teacher:

“The online mix of social media, blogs, podcasts, webcasts, discussion board, and Webinars create a dynamic learning environment in the class. Each technology has its place. The teacher has to know each technology very well before using it in the classroom.”

Calculus teacher (M3):

“I think Blended Learning is basically research, inquiry, and web-based learning that leads students to higher-order thinking in learning mathematical concepts on their own or in class. Students get to learn real mathematics and how underlying concepts work when they see that mathematics are truly related to real life situations. For instance, web-based resources are great productive tools for teaching and learning the graphing calculator. The graphing calculator serves as a tool and is designed to help users visualize and better understand concepts in math and science. When the graphing calculator instructions are part of the digital curriculum, students can make real world connections through the web. The interactive elements of a web-based platform allow students deeper understanding of the concepts taught in class and create more opportunities for students to acquire critical thinking skills for problem-solving assignments. I used to teach students how to use the graphing calculator using the LCD panel. Now, the instructions are posted on-line. Learning becomes interactive and more motivating. Since the instructions are on the web, students can visit the site anytime, anywhere to access the site and can spend as long as needed to refresh their memory on how to use certain functions in the calculator that were forgotten.”
**Biology teacher (S1):** “BL changes everything I do in the classroom. Flipping technology is the only way I want to teach now. This new method allows new hands-on problem solving ideas.”

In summary, teachers’ opinions regarding the benefits of the blended learning program towards students’ academic achievement can be summarized in three main points:

1. Integration of the online component into the direct teaching face-to-face instruction will improve learners’ concepts understanding and their ability to read academic and nonacademic texts in support of learning content subject texts.
2. Use of the blended learning model will increase students’ engagement and motivation to participate in learning all subjects.
3. Use of the blended learning model will enhance instruction and learning quality.

**4.3.2 Quantitative Analysis of Teachers’ Questionnaires Survey**

After each personal interview, the researcher reviewed the interviewers’ responses and used them as a reference guide to design the post-interview questionnaires survey for teachers, students, and parents. In concrete terms, these interviews helped the researcher to organize the questionnaires according to various interview themes used in the interviews.

The survey results contributed by teachers with respect to the use of BL on language literacy development. In some cases, teachers’ perceptions are similar from one term to another, in many cases, the percentage changes between the two terms drastically. The intention of these
surveys was to use the finding results to evaluate the effectiveness of the BL Literacy program towards literacy achievements, and to continuously update the instructional strategies for teachers to guide their teaching. While the qualitative analysis of data for addressing research questions revealed the views of participants’ personal beliefs and their educational values, the quantitative analysis using the Excel tool was intended to minimize any possible bias resulting from relying only on the qualitative data findings from the interviews and observations (Ref. 3.9). In practical terms, the Excel spreadsheet provides three basic types of information entries: labels, values, and formulas. The Excel spreadsheet “includes automatic graphing features with the ability to plot bar chart, pie graphs, histogram, and scatter grams from the spreadsheet data” (Bialas, 2001, p.3). The researcher used Excel’s graphics capabilities to present and analyze quantitative data generated from the questionnaire surveys. The Excel offers various options of vertical and horizontal stack bars, which are effective tools to show comparison of respondents’ responses between Term 1 (lower bar) and Term 2 (upper bar) by percentage. The scores from these surveys are based on the rating of agree/neutral/disagree. The graphs represent the percentage of teachers’ approval rating in each domain. In conclusion, these surveys provide information on participants’ opinions of the incorporation of blended learning instructional strategies in the literacy learning blended classroom.

The following surveys (Graphs 2, 3, 4, 5, and 6) provide information on the number of teachers who hold positive opinions of the incorporation of blended learning instructional strategies in the literacy learning blended classroom.
Finding 1: Teachers’ Beliefs about the Incorporation of the Blended Learning Literacy Program

Graph 3: Teachers’ Beliefs about the Incorporation of the Literacy Program (N=12)

All of the twelve teachers affirmed positively that BL supports students overcoming challenges in developing reading skills for more complex content materials. Almost all teachers believed in the effectiveness of the online resources for supporting students in acquiring different forms of literacy skills (1.1, 1.5). More teachers believed that students need support in
the areas of reading and concept comprehension during Term 2 because the materials become more challenging in advance chapters. Teachers also became more convinced that BL is supportive in helping students improve different forms of literacy skills through exposure to the rich OL resources, 1.1 and 1.2. The following Graph summarizes the survey results on teachers’ beliefs about the importance of incorporating the literacy program into the curriculum.
Finding 2: Teachers’ Beliefs about the Advantage of FTF Classroom

Graph 4: Domain (2) Teachers’ Beliefs about the Advantages of FTF Learning Environment (N=12)

In this survey, all participant teachers firmly believed that the key to check students’ understanding of the learning materials is immediate feedback (2.5). Most teachers also agreed that direct teaching in the FTF classroom is a promising means to build personal relationship between teacher and student, thus allowing a differentiated manner of instruction to meet individual needs (2.1, 2.2, 2.3, and 2.4).
Finding 2: Teachers’ Beliefs about Online Learning Environment

The following survey reflected teachers’ beliefs about the advantages of online learning environment between Term 1 and Term 2:

Graph 5: Domain (3) Teachers’ Perceptions about the Advantages of OL (N=12)

According to Graph 5, Term 1 and Term 2 surveys showed that teachers believed strongly that online learning offers students increased opportunities and a rich variety of resources for theoretical and practical knowledge in the humanities and non-humanities subjects (3.1, 3.3, 3.4,
3.5, and 3.6). Teachers believe that OL fosters habits for lifelong education 3.2), and allows autonomy and self-paced experience where students can personally direct their own learning processes (3.1 and 3.2). In this survey, all participant teachers firmly believed that the key to check students’ understanding of the learning materials is immediate feedback (2.5). Most teachers also agreed that direct teaching in the FTF classroom is promising. On the other hand, most teachers believe that students would need adequate guidance and the instructor’s orientation to maximize the benefits of the online resources (3.2).

The following teacher survey (Graph 6) compared teachers’ opinions on the advantages of blended learning environment between Term 1 and Term 2.
Graph 6: Domain (4) Teachers’ Beliefs about the Advantages of BL Environment (N=12)

Teachers became very positive in Term 2 regarding the benefits of BL on teaching and learning. High ratings are attributed to the advantages of flipping instructions, digital design, and the combination of online and human supports (4.1, 4.2, and 4.5). Teachers also saw BL methodologies as effective towards differentiated instruction by using OL resources to meet different learning styles. All teachers agreed that BL allows more time for students to season their learning on particular topics outside of the classroom.

<table>
<thead>
<tr>
<th>Domain 4: Teachers’ Beliefs on the Advantages of BL Learning Environment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Comparing Term 1 and Term 2</td>
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<tr>
<td>2nd Term Upper Bar Vs. 1st Term Lower Bar</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>2nd Term</th>
<th>1st Term</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.5 Flipping instruction increases both human support and online tools support to enhance learning and teacher-student interactions</td>
<td>100%</td>
<td>67%</td>
</tr>
<tr>
<td>4.4 Increases student autonomy: Student may spend more time online on particular topics that require additional time to learn and understand during the OL session</td>
<td>100%</td>
<td>80%</td>
</tr>
<tr>
<td>4.3 Integrating differentiated instruction using online resource enhances pedagogy to meet different learning objectives</td>
<td>92%</td>
<td>50%</td>
</tr>
<tr>
<td>4.2 Digital design of the curriculum allows flexible delivery of instruction</td>
<td>100%</td>
<td>50%</td>
</tr>
<tr>
<td>4.1 Flipping learning between FTF and and OL maximizes Bloom’s Taxonomy applications</td>
<td>92%</td>
<td>50%</td>
</tr>
</tbody>
</table>
4.4 Research Question 3: How does the blended method of learning affect students’ beliefs about the e-learning environment in the different components of the blended design: The face-to-face, online experience, blended learning?

4.4.1 Qualitative Analysis of Students’ Interview Findings

Interviews with individual students were conducted throughout the spring term in the 2\textsuperscript{nd} semester. During the entire school year, students were invited to the researcher’s office to talk about their experience with BL. The purpose of these interviews, which were often followed by a questionnaires survey, were intended to elicit from students their perception and attitude to their BL experiences. Students’ interviewing questions were guided by themes focused on eliciting students’ views and attitude regarding the BL concept and experiences. The researcher was interested also in finding out students’ opinion regarding the role of teachers in the learning process. The students’ interview questions are found in (Section 3.8.5).

**Theme 1: Student’s Preference of Learning Platform**

On the first day of class, students were given the Self-Reported Computer Experience Survey Questionnaires (Ref. 3.4.2). Teachers used this survey to inform the designing of the digital course materials.

**Theme 2: Student’s Perceptions on the Advantages of FTF, OL, and BL learning**

**Interviewer: How would you describe your blended learning experiences?**

Students expressed various reactions to the use of BL method as a way to learn content materials and develop reading and comprehension strategies in different content subjects. The following are some feedback from the interviewees.
An American History student commented:

“The class instruction helps me understand basic concepts and the online assignments help me see the connection between what I am learning in school and what’s happening in the real world. Learning makes sense because I can relate education to the real issues that are going on in other countries, not just in America, but also in other parts of the world.”

A Global History student said:

“Online learning offers global connections and rich content knowledge. I also like the live instruction and personalized learning experiences in the classroom.”

A Calculus student’s attitude towards the different kinds of support from FTF and OL learning is representative of many students who were interviewed:

“In the FTF classroom, when I am caught with a problem or procedure, I get help immediately to solve it before working on the more difficult problems. Now, I am used to the additional support of online tutorials. Learning in the FTF class is boring without the OL adventures. I like the computer-mediated assignments that allow me for hands-on practices. A variety of applications enhance my understanding of concepts and ideas I learned previously and especially in the past few days. After the lab practices, I would go back to my class notes and I always learn something new. After each activity, I usually come up with a list of questions that I want to ask my teacher when I go back to my class next day.”
An English student said,

“In the classroom, I like to interact face-to-face and be able to build personal relationships with my instructor and other students.”

A geometry student commented:

“Face-to-face teaching offers me differentiated coaching tailored to my own needs. Online provides for me a student-centered environment. I do my independent work and I can also discuss with my peer students.” A Physics student remarked: “I learn better with visual and interactive instruction. I can explore, construct, and experiment with different models for solving a problem before working on my own solutions.”

A Chemistry student talked about the effectiveness of the digital learning environment:

“Chemistry texts are boring, heavy, and beyond my ability to understand. Books don’t have enough supplementary explanations that help me to create meaning from what I see as disconnected information. Online gives me complementary materials and additional reading lists on the same topic.”

A Physics student described,

“I learn better with visual and interactive instruction. I can explore, construct, and experiment with different models for solving a problem before working on my own solutions.”

The Biology student expressed,

“Video tutorials, online activities, and supplemental skill sheets are the best contributions to my online experience.”
The Geometry student related his T1_Inspire CX graphing calculator tutorial experiences as the most extraordinary and useful tool for him to master abstract concepts in Advanced Algebra. “The simulation experience provides me with visual graphs of functions in 3-dimensional images and in real world situations.”

English student (E1):
“Flipping learning is good for low and high achievers. It helps me to know how to use in-class time well. In my learning cycle, sometimes I need more time listening to lectures and class instruction. Sometimes I need to learn it on my own. BL gives me new freedom with alternative ways of getting through the course materials “

Chemistry student (S2):
“Watching a video on thermodynamics explains and clarifies what my Chemistry teacher lectured for 10 minutes about the topic. I need both, her lecture and technology supports.”

Theme 3: Student’s Perceptions on Teachers’ Role in Learning
The majority of the students commented that teachers play a vital role in their learning process: helping them to set academic goals, orienting them in developing good study habits and appropriate learning behavior, and inspiring them to higher expectations.

Interviewer: What is your opinion regarding the teacher’s role in your education?

A Calculus student emphasized,
“My Calculus teacher is responsible for my good performance in the Advanced Calculus Placement test. I need a teacher to check my homework, give me feedback on class and
online assignments, and help me to go from simple to more difficult problems. I can’t do it alone.”

One Science student said,

“My teacher helps me to set clear and obtainable goals. I know I have a lot of autonomy in this course, I mean, when I am working alone in the computer lab. But the structured and disciplined FTF learning helps me to develop self-discipline strategies that I can apply to situations that are self-paced and self-determined, which are characteristics of the OL experiences.”

Another 9th grade student stressed:

“In the classroom or outside the classroom, the values the teacher attached to learning and working influence a lot on how I do my work. I am impressed when I see that a teacher works hard on lesson preparation or gives me the attention I need in class. Even if I work independently in the lab, I need to see that the lab experiences are the extension of the class lecture and applications. I strongly believe that a teacher’s personality, teaching style, and guidance will always have a lasting impact on my college life and the way I will carry out my responsibilities at work.”

Theme 4: Students’ Perceptions of BL on Engagement and Motivation

Interviews: Do you think BL instruction make a difference to your learning?

A math student explained,

“It’s effective to see abstract concepts visualized in 3-dimensional presentations.”
Another math student likes the self-pace and self-autonomy style of learning.

“I can repeat the presentations and activities as many times as I need to in order to understand fully a particular application.”

12th grade Economic student:

“The combination of class instruction and online activities make a big change or rather improves my attitude towards learning. I feel that learning is more meaningful and purposeful now. I have all the opportunities of developing my intellectual capabilities to their fullest. The Course Site is very helpful to help me keep track of my learning. I can assess my progress daily.”

10th grade Global Studies student:

“My teacher combined online teaching with personalized coaching in the classroom. It’s been working very successfully for me.”

11th Grade student:

“My teacher flips instruction between in-class reading and online activities. There is no dead time in the class. Everyone is engaged in some related task. My grades improved by more than ten points between last semester and this semester.”

12th grade Economics student:

“My teacher always introduces the right flip like introducing a historical clip or event, a cultural norm, or background of the story to make learning alive to us.”

10th grade American History student:

“We have to prepare a video at the end of each chapter in the OL Lab. These assignments give us a chance to work individually or in a group. We are learning the content while
engaging in the video production. Each one has a role to play. I think this is the best way to
learn a history lesson because the multi-tasks required for the entire video production
kept us engaged in different meaningful tasks. After the video production, I know I will
remember the story forever.”

11th Grade student:

“I used to find it so difficult to improve my Social Studies grades because I have a bad
memory and don’t’ retain what I learned before. The video lectures are sometimes better
than the live instructions because I can go back to them as many times as I want.”

9th grade Biology student:

“It is more motivating to see a video explaining a concept than to participate in a Webinar.
I often go to the National Aeronautics and Space web site for simulative Biology activities.
Learning is a lot more fun with BL.”

4.4.2 Quantitative Findings of Students’ Questionnaires Survey

The quantitative results of four subject classes (English, Social Studies, Math, and Science)
were reported in Section 4.2.1. The classes were grade 10, 11, and 12 with a total of 77 students
whose ages ranged from 15-19. Grade performances were compared and analyzed between non-
blended and blended classes in Sections 4.2.1.1, 4.2.1.2, 4.2.1.3, 4.2.1.4. The following survey is
focused on students’ perceptions on the incorporation of the literacy program within the content
curriculum, which was administered only to participants of the blended learning program. The
aim of this survey was to assess students’ perception of the efficacy of the literacy program on
reading and comprehension in content areas. The students’ questionnaires survey are divided
into four domains represented by Excel graphs. The following surveys (Graphs 7, 8, 9, 10, 11, and
provide information on the number of students who hold positive opinions of learning in the blended classroom.

**Finding 1: Students’ Beliefs about Face-to-face, Online, and Blended Learning**

**Graph 7: Domain (1) Student Preference as to FTF, OL, BL Environment (N=77)**

The survey findings indicate that students’ choice of the learning environment is contingent on grade levels. Twelfth grade students demonstrated the highest preference (75%) to the BL environment in comparison with the 11th Grades (50%), and 10th grades (25%). The survey showed that younger students seem to prefer the personalized and direct instruction of FTF, whereas older students incline more towards OL and BL. In general, students at all grade levels have a positive attitude towards the blended classroom. The following **Graph 9** shows students’ perceptions of the advantages of OL.
Finding 2: Students’ Perceptions of the FTF Learning Environment

Graph 8: Domain (2) Students’ Perceptions of Advantages of FTF Classroom (N=77)

| Domain 2: Comparing Term 1 and Term 2
| Students’ Perceptions on Advantages of FTF Learning Environment
| 2nd Term Upper Bar vs. 1st Term Lower Bar |
| 2.6 Teacher is role model for developing study habits, appropriate group interactions and discipline behaviors |
| 2.5 Teachers modeling applications in class are important for deeper learning |
| 2.4 Facilitates development of personal relationships with teachers and among peers |
| 2.3 Allows verbal and nonverbal communication |
| 2.2 FTF instruction offers immediate differentiated coaching and feedback |
| 2.1 Live instruction and personalized learning experiences |

Students’ perceptions of FTF learning remained very much the same in items (2.1, 2.2, 2.3, and 2.4) for both terms. Students revealed a stronger perception in Term 2 regarding teachers as their role model in two aspects: modeling applications in class and helping them to develop habits and discipline behavior.
Finding 3: Students’ Perceptions of the OL Environment

Graph 9: Domain (3) Students’ Perceptions of OL Experiences (N=77)

As indicated in the survey graph, students’ reactions to the OL model changed acutely in every single agenda item from the first survey (conducted at the beginning of the semester) to the second survey (conducted in March to May) as they gained experience through the day-to-day exposure to the BL Literacy Program. Students seem to have highly prized these features of OL: the rich and the variety of resources available, the student-to-student connectivity, and the increase of seat time for learning and global connections. Quite revealing also is the percentage
of students’ appreciation of autonomy and self-paced learning that increased tremendously in Term 2, indicated in (3.2, 3.3, 3.4, 3.5, and 3.6).

Finding 4: Students’ Perceptions of BL Instruction

Graph 10: Domain (4) Students’ Perception of BL Instruction (N=77)

The findings reflected in each agenda item matched closely with the findings of the conversations recorded in the student interviews and from the teachers’ survey (Section 4.3.2). Students showed a high approval of using flipping technology to connect OL and class instruction,
and balancing learning between digital textbook and OL resources. Students also appreciate the increased collaboration and communication between teachers and students (4.5). In every category, the students’ approval of the BL environment increased by 50% (4.3, 4.4, 4.5, and 4.6). 87% of students (2nd Term) vs 48% of students (1st Term) believed that digital curriculum is convenient and enhances classroom instruction; 85% (2nd Term) vs (48%) saw flipping instruction as useful for integrating online resources as supportive for in-class learning.

4.5 Research Question 4: How does the use of blended instruction affect students’ literacy achievements regarding content subjects’ reading comprehension in terms of the following: Making connections with prior knowledge, visualizing concepts and ideas, asking meaningful questions to determine text importance, and make inferences, and content synthesis?

4.5.1 Quantitative Analysis of the Survey of Students’ Perception of the Effectiveness of Blended Instruction.
**Finding: Students’ Perceptions of Incorporation of the Literacy Program within the Content Curriculum**

**Graph 11: Domain (5) Students’ Perception of Improving Literacy Program in the Content Reading and Comprehension (N=77)**

<table>
<thead>
<tr>
<th>Domain 5: Comparing Term 1 and Term 2</th>
<th>2nd Term</th>
<th>1st Term</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.5 Blended approach is supportive in helping students improve in different forms of literacy through a variety use of online resources</td>
<td>98%</td>
<td>75%</td>
</tr>
<tr>
<td>5.4 Reading with understanding and fluency is necessary to comprehend content message accurately</td>
<td>95%</td>
<td>95%</td>
</tr>
<tr>
<td>5.3 Students face deeper and more challenges in reading content subject materials</td>
<td>90%</td>
<td>80%</td>
</tr>
<tr>
<td>5.2 Most students need the support of a well-designed Literacy Program for improving reading skills for application on reading higher grade-level literature</td>
<td>96%</td>
<td>60%</td>
</tr>
<tr>
<td>5.1 Most students need more support while reading complex texts</td>
<td>90%</td>
<td>80%</td>
</tr>
</tbody>
</table>

Reading the above **Graph 11**, the majority of students strongly supported the BL approach for using OL resources and FTF instruction for improving various forms of literacy skills, including reading skills for complex text readings in content subjects (5.4, 5.5). Students consistently believed that reading with understanding and fluency is key to comprehend content messages accurately (95% approval for both Term 1 and Term 2); most students need support in reading...
complex texts (80% in Term 1, and 90% in Term2). Very noticeable is the strong belief demonstrated in 5.5 showing 98% of students strongly convinced that the blended approach is supportive in different forms of literacy learning through online resources.

4.6 Research Question 5: How has the blended methodology of learning influenced students’ engagement, involvement, and motivation towards learning?

4.6.1 Quantitative Analysis of Students’ Questionnaires Survey

This survey aimed to assess the efficacy of the literacy program on students’ motivation and engagement in class discussions in the blended classroom. Again the comparison was between Term 1 and Term 2.
Finding 1: Effectiveness of BL to Students’ Participation in Class Discussions

Graph 12: Domain (1) Students’ Participation in Class Discussion (N=77)

The findings on the students’ learning behavior in this survey show that students improved in literacy responses by giving a more meaningful explanation beyond the ‘yes’ and ‘no’ answers. Most students were able to continue and elaborate on other students’ answers. A marked improvement is noted in every category ranging from 1.1 to 1.4.

The findings also demonstrated students’ behavior changes between the beginning of the implementation of the BL Program and when the program was fully executed throughout the second term. Results indicated that students increased academic activities in the class by approximately 20%, non-academic activities such as chatting, purposeless Google Search, emails, and messages texting were reduced about 10% during Term 2.
Finding 2: Changes in Students’ Online Class Activities between Term 1 and Term 2

Graph 13: Domain (2) Students’ Online Class Activities (N=77)

4.7 Research Question 6: How does the BL Model bring about a change in parents’ attitude towards their children’s education?

4.7.1 Parents’ Interview Findings

At the beginning of the school year, the researcher and BL teachers initiated a Parents’ Workshop interview meeting, which took place in the library after school on the third Friday of October. This section describes the main themes of the conversation between the researcher and parents. The interview objective was twofold: 1. Parents’ perception of their role in their children’s education. 2. Parents’ perception of the incorporation of the Literacy Program into the core subjects using BL methodology.
Finding 1: Parents’ Perception of Their Role in Their Children’s Education

Most parents believed that parental involvement in children’s education is important for their developmental and educational progress.

Interviewer: What is your opinion regarding communication with teachers?

The father of a 12th grade student expressed:

“I think schools need to provide more opportunities for teachers and parents to have a shared language so we are on an equal footing as to what is happening to my child’s personal growth and academic progress at school.

My child is going to college next year. I am eager to support her in any way I can, such as collaborating with the college advisor about college choices and financial issues from my end. I am happy that she is enrolled into the BL Program with a special literacy component to help her improve progress in other subjects besides English.”

The mother of a 10th grade student:

“I want to know what knowledge and skills, and academic standards my child would be expected to master in every subject this year in preparation for next year. Knowing the performance standards expected of my child, I would be able gauge her work to the standards and rubrics and see if my child is achieving or not achieving the learning goals for each assignment.”

Interviewer: What do you think of the Literacy Program, and content literacy?

The parents of an 11th grader replied:

“I think my child has difficulties with understanding the complex texts when they have long and complex sentences with embedded advanced vocabularies. I also noticed that
she often struggles with the words of the problem-solving parts of the math assignment. I hope the BL Program, with the goal of creating balanced literacy across content subjects, will make reading easier for her.”

Finding 2: Parents’ Perception of the Literacy Program in the Core Subjects Using BL Methodology.

Interviewer: What do you think of the Literacy Program using the BL model for instruction and learning?

Several parents expressed that they are not familiar with the BL models but hope to learn more about them.

**One mother said**, “Seeing my child’s excitement about BL, I went online and searched on the topic myself. This generation is lucky to have so many resources in their hands for learning.”

**Another parent said**: “My child likes very much the Vocabulary Building section of the web course site. She likes to go back and forth to the same vocabulary links because she needs to be reminded of the definitions and meanings related in the day’s lesson.”

At the end of each interview, parents were asked to participate freely in the following questionnaires survey. The survey strongly suggested that parents are consistently interested in how their children are learning at school. Their concerns are concentrated on more collaboration and communication with teachers, connecting school education with parental nurturing at home,
and planning with teachers to create reading lists for outside readings beyond the classroom for college readiness.

The survey strongly suggested that parents are consistently interested in how their children are learning at school. Their concerns are concentrated on more collaboration and communication with teachers, connecting school education with parental nurturing at home, and planning with teachers to create reading lists for outside readings beyond the classroom for college readiness. The following surveys (Graphs 14 and 15) provide information on the number of parents who believe in their role in their children’s education and their opinions of the Blended Learning Literacy Program.
4.7.2 Quantitative Analysis of Parents’ Questionnaires Survey

Finding 1: Parents’ Perception of the BL Education

Graph 14: Domain (1) Parents’ Perceptions of Their Children’s Education in BL Classroom (N=48)

Parents are concerned with the use of technologies in the classroom, and mostly how BL situations may help learners develop positive character traits such as learning habits, discipline in time management, and attitudes towards working with peers (2.1) in the OL collaborative activities. Parents’ approval of new technologies for college preparation increased from 5% to
95%. This indication may have implied that parents stepped up their approval when they saw their children showed increased interest in the new BL environment.

**Finding 2: Parents’ Perceptions of the BL Literacy Program**

**Graph 15: Domain (2) Parents’ Perceptions of the BL Literacy Program (N=48)**

<table>
<thead>
<tr>
<th>Domain 2: Comparing Term 1 and Term 2</th>
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</thead>
<tbody>
<tr>
<td><strong>Parents’ Perceptions of the Incorporation of Literacy Program within the Core Subjects</strong></td>
</tr>
<tr>
<td>2nd Term Upper Bar vs 1st Term Lower Bar</td>
</tr>
<tr>
<td>2.1 Parents are concerned about their children’s character development and academic progress in all subjects</td>
</tr>
<tr>
<td><img src="chart.png" alt="Chart showing percentage of approval for each statement" /></td>
</tr>
<tr>
<td>2.2 Parents believe that proficient reading skills are important for success in school</td>
</tr>
<tr>
<td>2.3 Parents approve of new learning opportunities provided by BL methods for their children</td>
</tr>
<tr>
<td>2.4 Parents approve of their children learning new technologies in preparation for college studies and future career</td>
</tr>
</tbody>
</table>
The following points summarize the major features of the face-to-face and online learning environment that teachers and students claimed to be responsible for the success of the blended learning literacy program.

**Face-to-face:**

- Live instruction and teacher-designed personalized learning experiences.
- Direct teaching offers differentiated coaching opportunities tailored to the needs of each learner.
- Teachers are able to read body-language signs and can give individual attention to address student concerns, especially for ELLs.
- Students can ask questions and receive immediate replies and supports regarding class lessons and notes, or any hardware or software technology issues dealing with the blended learning experiences.
- Use of flipped classroom strategies. *(Ref. 3.5.3 and Figure 3)*

**Online:**

- Supports learner-centered environments, independent work, and collaboration among learners.
- Students take ownership of all aspects of learning and learn to be more responsible for his or her work.
- Students develop self-discipline in study habits by working at his or her own pace.
- Computer-mediated learning assignments call for hands-on practice and enhances the understanding of the concepts and ideas taught in the face-to-face classroom.
• Online learning provides rich resources for practical knowledge and allows students to extract information from a variety of resources anytime and anywhere.

• Online learning offers global connections and rich content knowledge.

• Online resources can be available on-site and off-site outside of school hours and thus provide increased opportunities for seat time learning.

• Increases virtual student-to-student connectivity opportunities

4.8 Summary

To summarize findings based on the quantitative and qualitative methodologies, the researcher gained a deep understanding of how blended learning instruction facilitated students’ literacy skills development. The most obvious contribution of blended learning in this case study is the apparent connection of literacy achievement and its impact on students’ academic performances reflected in content subjects’ grade improvement. It should be noted that each student’s progress is evaluated across the curriculum in four participated classes: English, Social Studies, Math, and Science. This study implies that students were able to effectively apply the reading comprehension skills learned in the literacy classes to each of the four content subjects. Having acquired the appropriate literacy reading skills, students were able to improve performances in all four subject areas. The next chapter will further discuss the qualitative and quantitative results of this case study.
CHAPTER 5: DISCUSSION ON DATA ANALYSIS

5.1 Overview

The results of this study on blended learning in the high school setting were overwhelmingly positive. The general reaction of participant teachers was fully in line with the beliefs advocated by the authors cited in the literature review, who consider that blended learning is the best of both worlds: Ward (2004), Herrmann-Negdi (2009), Bele & Rugelj (2007), Anderson & Skrzypchak (2011), Graham (2006), Garrison & Kanuka (2004), Bath & Bourke (2011), Behjat, Yamini, & Bagheri (2011), Beisser & Steinbronn (2001), Bersin, (2004), Bonk & Graham (2005, 2006), Crowley, Smith & Shaffe (2006), Reid (2006), Dzubian & Moskal (2011), Martyn (2003), Means et al. (2013), Young (2002), and Watson (2008). Previous empirical findings are fully in line with the perspective identified by the current study that blended learning, which combines the benefits of face-to-face instruction and online activities, offers highly effective instructional and learning modality in education. Numerous previous studies demonstrate that the blended learning environment maximizes learning opportunities for hybrid subject courses (Graham et al., 2013), increases language skills and reading proficiency (Alasraj & Alharbi, 2014), enhances the acquisition of English and bilingual languages (Eng & Muuk, 2015; Jensen, 2005; Leakey & Ranchoux, 2006; Goertier, 2012), develops learners’ writing ability and reading skills (Keshta & Harb 2013; Liu, 2013), inspires collaborative autonomous experiences in a computer-mediated language learning environment (Kessler & Bikowski, 2010; Meskill & Mossop, 1997), facilitates interactive practices in a technology-enriched, blended classroom (Liang & Bonk, 2009), and improves students’ reading efficiency in scientific articles (Dori et al, 2013).
However, the present research project goes much further than these previous publications by providing stronger and firmer evidence for the effectiveness of blended learning not just in one subject or course, but in four content areas in the high school curriculum. This investigation has shown evidence of 77 students’ academic achievements at three grade levels (10th, 11th, and 12th) in four content areas, and has provided consistent results obtained by the same students in each of the four subjects. Each of the blended classes that participated in English, Social Studies, Math, and Science demonstrated a significant improvement in their final grade report between Term 1 and Term 2.

5.2 Discussion on Quantitative Data

In our study, the students’ final grade scores on the four subjects’ Term 1 and Term 2 grades were the data source for the quantitative analysis. The performance grades are found in Appendix M and N, and the score gain for each subject area is illustrated in Diagram 5 (English), Diagram 9 (Social Studies), Diagram 13 (Math), and Diagram 17 (Science).

A one-way ANOVA analysis was used to determine whether there were any statistically significant differences between the means among the blended learning students and non-blended learning students. That is, whether or not students’ improved performances were related to the implementation of the Blended Learning Literacy Model. Our findings showed that there is a statistical difference of $p$-value <.000 in each of the four subjects evaluated at the end of the school year. The quantitative statistical evaluation of final grades of blended and non-blended students scored was similar in each of the content subjects in Term 1. However, the average scores of the blended students showed significant improvements in Term 2 against Term
1 as compared to the non-blended students who showed no significant change of score grades between Term 1 and Term 2. For the blended learning students, Mathematics score gain was 16 times higher in the blended program than in the non-blended program. Science score gain was 14 times higher in the blended program than in the non-blended program. Social Studies gain score was 10 times higher in the blended program than in the non-blended program. The English score gain was 5 times higher in the blended program than in the non-blended program. Based on the ANOVA analysis, the researcher concluded that performance gains in the four content subjects showed that students’ achievement in every content subject was positively related to the blended approach to instruction. The conclusion was that those students’ achievement scores on subjects taught using the blended model were greater than those for subjects taught without the blended learning model in term 2. One very important observation is the high score gain of the non-humanities Math and Science subjects. This seems to imply that improvement of the literacy skills of reading and writing impacts positively on concept comprehension of more complex texts in non-humanities subjects. The reading skill strategies learning in the literacy class helped students to understand better math and science contents. It seems helpful to have math and science (e.g. physics especially) concepts explained with moving diagrams and the like. It could also be that literature problems, e.g. reading issues, just take longer to solve than one or two semesters. At any rate, it would be an interesting question for future study.

5.3 Discussion on the Qualitative data

One possible reason why students demonstrated significantly better on overall mean scores in Term 2 over Term 1 is that both teachers and students gained familiarity and proficiency
in the use of the Course Site through regular and well-planned technology training, and were then able to focus more on academic studies without the undesirable distractions. This could be also explained in the following way: At the initial stage of the implementation of the blended learning program, interviews with teachers and students showed that both groups were trying to adapt to the new learning environment. Most participant teachers expressed the view that they did not have sufficient knowledge of online and blended experiences. The instructors faced the challenge of having to acquire a new approach to managing class lessons, and learning how to transit from a traditional to a blended learning pedagogy using blended methodologies. Subject teachers had to re-examine course materials, design new online activities, acquire different instructional skills, and manage the course content in-class as well as online. These difficulties are similar to those mentioned in the study by Precel, Eshet-Alkalai, & Alberton (2009). Throughout the first term, teachers and students were attending technology training to learn how to manage the Course Site. Therefore, teachers had less time to practice blended instruction with integrated technologies. Several teachers expressed the view that they did not have sufficient online or blended learning experiences. These were some of the remarks and responses collected during Term 1 from participant teachers, which explained why there was little progress in Term 1. For example, a chemistry teacher commented: “My knowledge of blended learning is superficial and shallow at this point. In Chemistry, I have to deal with many formulas, symbols, and diagrams. I don’t have yet the skills to produce them on the web page.” An English teacher said: “At present I don’t know too much about the blended learning model. But I’ve developed a greater interest in acquiring more knowledge about the blended learning system after training.” A 12th grade Physics teacher: “I am a bit skeptical whether students can really learn the content materials in a
blended situation when I am still trying to learn the course portal myself.” However, by the end of Term 1 and entering into Term 2, teachers’ views changed completely when they observed that students’ engagement and motivation had improved tremendously as the result of using the digital curriculum and online resources with greater proficiency. In practice, this research study supported the beliefs advocated by Orlean (2014) and Daggett (2010) on the importance of having a long-term, and a continuous professional development plan for supporting teachers to gain competency in new technology initiatives. Similarly, Chang (2011) recommended that teacher education in the blended classroom must include both blended instruction and technology literacy.

In terms of instructional strategies, blended learning with the “flipped classroom” strategy provided teachers with new avenues to introduce the appropriate knowledge at different stages of the scaffolding to support learners (McCue, 2014). In addition, teachers agreed with Tucker (2012) that the flipped classroom strategy not only allowed them to create a more personalized and collaborative learning environment, but also enabled them to present content materials in multi-disciplinary channels (Ref. 3.5.3, 3.5.4). Furthermore, teachers did not have to spend class time teaching the materials that students could master on their own (Bergmann, 2012). Instead, teachers could use class time to model difficult-to-solve problems (Ref. 3.5.4, Figure 3, Figure 4). It became noticeable from the survey analysis that as students advanced toward the end of the school year, more and more students were in favor of the self-paced and self-autonomous style of learning. The outstanding performances at the end of the year could be explained and complemented by the comments that teachers and students made
regarding instruction and their learning experiences in the interviews (References to Teachers’ interviews Findings 4.3.1, Students’ Interviews Findings 4.4.1).

Both Term 1 and Term 2 surveys suggested that students were aware of the path they needed to take to improve content subject performances. Responses to items in the March student survey (Section 4.5.1, Graph 11) reported more than 90% out of the 77 students agreed that the blended approach would be supportive in helping them to acquire different forms of literacy proficiency through a variety of online resources. Ninety eight percent of the 77 students believed that reading with understanding and fluency was necessary to comprehend content messages accurately. The increased conviction from Term 1 to Term 2 as reflected in each item of the survey suggested that students appreciate the blended method for supporting academic studies. A very high percentage of students believed that the digital curriculum allowed them to self-assess their performance and gauge their learning any time they wanted. Therefore, blended learning increases students’ autonomy and gives them more decision-making opportunities. The belief in the effectiveness of blended learning for promoting and developing students’ autonomy and self-determination in the learning process has been noted by previous empirical studies, such as those conducted by Deci & Ryan (2002), Codreanu, Chein & Robin, Chang (2005), Leakey & Ranchoux (2006), Kessler & Bikowski (2010), and Hidi & Renninger (2006). The interviews and surveys also indicate that both teachers and students believe that the Course Site makes it easier for them to frequently monitor and assess learners’ academic progress in each subject, and allows students to communicate their concerns to teachers immediately via emails or through the discussion board. In addition, the online digital portal is user friendly, and the design is
convenient for viewers to navigate, examine course materials, and prep for quizzes at the end of each chapter or unit before moving forward.

From class observations, three areas of activities were identified: Students were either working on some meaningful academic tasks or involved in non-academic activities, or just chatting with each other (Ref. Graph 13). The cumulative average of each type of activities was recorded in the graphs. The findings showed a different activity pattern between Term 1 and Term 2 with regards to students’ reactions to the teachers’ questions in the face-to-face classroom. In Term 1, data suggested that students were less active in the classroom. Among those who responded to the teachers’ questions, 30% gave a simple yes or no answer, 5% replied with some sort of explanation or further elaboration on the content, and about 5% of the students created a new thread for class discussion. There were noticeable changes in Term 2 in class activities as more students became actively engaged in class discussions or group activities. There were 60% of students who responded to the teachers’ questions, a 20% jump from the 40% in Term 1. Examining the quality of students’ responses throughout Term 2, the average percentage of students who answered with a simple yes or no answer was reduced to 15%. In addition, more students gave meaningful answers in Term 2. There were also more students who persuaded other students to participate in the class discussions. Our findings regarding the relationship between student motivation and active participation, and the level of engagement of students in class activities are complementary to these studies conducted by Saeed & Zyngier (2012), Ryan & Deci (2000), Caravias (2014), and Teo, Chang & Leng (2006), which advocated that the quality of students’ engagement is aligned with increased intrinsic motivation. These studies suggested that students who are intrinsically motivated tend to have higher achievement in their
academic studies. In concrete terms, the blended environment facilitates easy access to course materials, web-based resources, simulations, electronic books, online quizzes, interactive activities, and group collaboration, all of which are designed to inspire students to improve the quality of engagement and increase interest in accomplishing learning tasks.

Both teachers and students confirmed that blended learning had increased the breadth and depth of students’ literacy proficiency, including the ease with which students learned to apply their literacy skills to improving content readings. Students claimed that improved reading skills served as a catalyst for stimulating new interests in reading materials that they previously considered too difficult or too boring to read. We find similar opinions in the work of Burkhardt (2003), Coan (2007), and Duffy (2003). The survey findings are supplemented with the class observation notes recorded by the researcher in the students’ personal interviews conducted at different times throughout the year. The reports also showed that there were different blended activities going on in the classrooms, wherein teachers used blended strategies to create a more dynamic and interactive learning environment. The researcher observed that some students were taking notes, others listening to the teacher, reacting to another student’s remark or opinion, or watching and following the classroom discussions. The blended learning environment increased both teaching and learning opportunities, and interactions between teachers and students and among students.

In conclusion, grade performances in each subject strongly supported the qualitative findings. The gain in scores from Term 1 to Term 2 in every subject was at the rate of five to sixteen times higher in the Blended Learning Program than in the Non-Blended Learning Program. Both qualitative and quantitative findings of this case study have demonstrated that
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Blended Learning definitely had a significant impact on improving students’ performance across the curriculum.

**5.4 Factors Which Contributed to Learning Outcomes**

The researcher looked into several factors which could contribute to the remarkable academic performances of those students who participated in the blended learning literacy program.

**5.4.1 Teachers’ Conviction of Their Roles in the Blended Classroom**

One important observation identified from reading teachers’ and students’ post-interview questionnaire results (Ref. 3.8.3, 4.3.1, 4.3.2 3.8.4, 3.9.1, 4,4,1 4,4,2) was that teachers viewed themselves as having dual roles as educators and facilitators (Figure 5). This conception is aligned with Barr & Tagg’s (1995) idea of the new paradigm for teaching and learning, and Biggs & Tang’s (2007) belief that teachers play the role of a facilitator. In the blended environment, many teachers believed that the role of a teacher in the blended classroom had not diminished but had increased. In practice, each of the components of the blended classroom offered them a unique way of exercising their leadership role in teaching, and influencing students’ formation and learning process. Teachers saw themselves as instructors and role models when they were involved in direct teaching in the classroom (Lumpkin, 2008). On the other hand, teachers believed that they performed the role of facilitators when they supported students in the online discussion or provided feedback via the portal’s communication system. In terms of instructional delivery, most teachers agreed with Heller & Greenleaf (2007), Misulis (2009), Ness, (2009), and Nuttall, (1982) that the blended classroom is most resourceful in helping students acquire
important literacy skills that benefited them not only by improving language literacy, but also by supporting other content studies.

5.4.2 Effective Use of Pedagogy in the Blended Classroom

Class observations revealed that teachers were effective in applying different tools and activities according to Bloom’s various levels of thinking skills to support knowledge mastery (Ref. 3.5.4). A major concern of teachers was how they could foster a learning environment that helped motivate students to learn. This was the priority question most teachers asked in their Common Planning meetings: How to organize and use blended methods and strategies to motivate students and maintain their passion for learning. One 12\textsuperscript{th} grade Physics teacher expressed: “I believe teachers remain and continue to play the key role as change agents for students’ engagement and motivation.” Most teachers believe that the new Blended Literacy Model, with its greater capacity for new technology practices, empowers both short-term and long-term academic progress.

Classroom observations and conversations with teachers and students revealed that the ‘flipped classroom’ instruction was the most desirable of the blended instruction strategies as an integral component of the flexible curriculum design. Within the flexible design, cognitive flexibility in the domain of instruction and learning is highly recommended by Spiro, Feltovich, Jacobson, & Coulson (1992). Both teachers and students admitted that this new instructional strategy created flexibility for instruction delivery, and greatly enhanced the blended learning environment. The teachers also saw the relationship between the blended environment and the student’s increased motivation to perform. They stated that ‘flipped classroom’ strategies improved and transformed students’ engagement on task performances, and produced
remarkable grade achievements in every subject. The majority of teachers also added that in practice, the ‘flipped classroom’ is an excellent strategy in applying Bloom’s Taxonomy for reading assignments (Ref. Section 3.5.3, 3.5.4). Teachers used this strategy to prepare students with pre-assigned video lectures posted to YouTube (Figure 3). By applying effective pedagogical strategies and techniques such as the ‘flipped classroom’ between face-to-face instruction and online resources, teachers claimed that they could extend learning opportunities and communication between teachers and students within and beyond the classroom. Students are asked to visit a Wiki link to learn the definitions and basic concepts or visit a video link that teachers had posted on YouTube before class to gather information on the assigned reading in order to arrive at class better prepared for deeper discussions. Teachers can then use the class time for focusing on higher levels of the Taxonomy - analyzing, evaluating, or creating. On this point, teachers were in agreement with McCue (2014) that the flipped classroom allowed teachers to spend more time with students by having them learn the lecture's main ideas ahead of class time. It seemed that both teachers and students were endorsing the “flipping” instruction with a high rating. Using the flipping technique for creating “First exposure” prior to class is a great advantage of hybrid learning, reported by some teachers (9th grade English teacher). “Flipping allows new hands-on problem solving ideas” (9th grade Biology teacher). “‘Flipping the classroom is an excellent strategy for developing Bloom’s Taxonomy of learning” (12th grade English teacher). Using the flipping classroom strategies, teachers again reported that they have more quality time with students by having students familiarize the class lesson ahead of class time. The advantage of using “flipping” strategies for literacy instruction and learning was favorably described in two recent articles written by McCue (2014) and Tucker (2012). According
to Bergmann (2012), it is a learning environment where teachers can increase personalized contact with their students, and encourage students to take ownership of their learning. The majority of the students also reported that they improved in academic performance in the blended literacy program, and affirmed that their learning became more challenging and enjoyable.

5.4.3 Effective Use of the Digital Curriculum (Figure 7, Figure 8)

The benefits and effectiveness of the digital curriculum in the e-learning environment are consistently affirmed by numerous empirical studies and confirmed by the teachers’ and students’ experiences in the current study: Participant teachers claimed that the application of the digital curriculum supported a learner-centered environment, enabled students to learn at their own pace, encouraged independence and collaboration among learners, and prepared students for the future with improved technology skills. In addition, when the appropriate blended instruction and technologies were integrated into the digital curriculum, a personalized learning environment was made possible for teachers to be more attentive to individual students. The personalized learning feature of a student-centered environment is strongly stressed by Green (2013). To this effect, when teachers designed the digital curriculum, the purpose was not only to spark the students’ interest in learning a topic in order to achieve mastery, but also to help students to develop their intellectual capabilities: “The organization of the digital curriculum within the e-learning platform included the research, inquiry, and web-based activities in order to lead students to higher-order thinking” expressed by one Math teacher. In particular, teachers believed that the digital curriculum is most beneficial for language learning because of the enriching resources such as video recording, colorful multimedia
illustrations, the e-library with its grammar and vocabulary banks, web-based lessons that are most suitable for visual and audio learning, and self-tests and exercises, which students can access anytime, anywhere, and in any place (Figure 6). These benefits of the e-learning environments have been extensively explored and supported with empirical studies by numerous researchers (Graham, 2008; Lim & Morris, 2009; Means et al., 2013; Tyson, 2015; Teo et al., 2006; Zimmerman, 2012).

The digital curriculum (Ref. 3.7.6) enabled students to go back and forth to the online lessons to repeat the same materials over again and again until there is content mastery. In addition, teachers found that the digital curriculum facilitated diverse literacy skills development, such as reading, writing, and comprehension not only in the English classes, but also in content area subjects. The teachers’ opinion on the advantages and effectiveness of blended learning environment and blended instructional strategies is in accordance with great quantities of empirical studies which have highlighted the usefulness of blended learning for language learning (Alasraj & Alharbi, 2014; Sharma, 2010; Essam, 2010; Johnson, 2013; Kesht & Harb, 2013; Leakey & Ranchoux, 2006; Liu, 2013; Liang & Bonk, 2009; Behjat, Yamini, & Bagheri, 2011). In brief, the surveys taken from teachers’ and students’ interviews and surveys indicated that teachers and students are highly satisfied with the benefits of blended learning methodology for language and content subjects’ instruction, and for developing the seven essential literacy strategies advocated by Adler (2004). Indeed, teachers’ and students’ opinions regarding the advantages of implementing a blended learning literacy environment can be compared with most contemporary studies, which reflect a parallel pattern of positive attitudes regarding the benefits
of the blended learning literacy program (Shanahan & Shanahan, 2008; Stock, 2012; Behjat et al., 2011).

5.4.4 Engagement and Motivation in Blended Learning

Our findings illustrate that the use of blended instruction seemed to inspire a positive change of attitude in every participant teacher and student. Participant teachers believed that the students’ interest in learning and their academic progress are very much related to their intrinsic motivation. In the current study, the researcher studied participant students’ level of motivation by observing their engagement in the learning activities and how they participated in the Socratic Seminar discussions in the blended classrooms; the Socratic Seminar is one of the instructional strategies Bernasconi (2010) highly endorsed as a means to foster students’ critical thinking and self-confidence (Ref. 2.9.3). As the result of teachers’ effective use of various blended strategies, students became more motivated, better engaged, and developed a greater desire to participate in collaborative team projects than in a regular classroom (Ref. 2.9.2). Furthermore, students appreciated the function of immediate feedback provided by the Course Site. It seemed that when students had a chance for self-evaluation to support self-learning strategies (Ref. 2.9.4), they paid more attention to the quality of their performances. One 10th grade student commented, regarding online feedback: “I can ask questions and receive immediate replies and supports from the Virtual Tutor regarding instructions and notes which I didn’t quite understand in class.” In the Post-Interview Survey 100% of the students voted in favor of the advantageous function of the Course Site. Another outstanding advantage mentioned by the students was that the digital curriculum is convenient, paperless, inexpensive, and enhances classroom instruction because the Hybrid Format increases learning opportunities
to cover the required learning objectives. The series of observational reports showed that students were kept focused and entertained when teachers integrated online resources such as YouTube and film clips to enrich class instruction. These findings were aligned with researchers who concluded from their research studies that blended learning instruction increase learners’ intrinsic motivation, empowers them to participate and engage in their work with more authenticity, and creates a positive student-focused learning environment (Kesta & Harb, 2013; Bieg, Backes, & Mittag, 2011; Cordreanu, Chein, & Robin; Johnson, 2013; Kristin, 2014; Poon, 2013; Taylor & Parsons, 2011). Evaluation of students’ interviews also confirmed that teachers’ classroom behaviors affect students’ level of motivation and engagement. The majority of students reported that while learning with technology is fun and interesting, they continued to insist that the teachers’ positive role modeling is the real key to their intrinsic motivation to learn and to achieve challenging goals. These were some responses from students at different grade levels that revealed the important role teachers assumed in guiding students to the path of success. “My teachers help me set clear and achievable goals.” A 10th grade student said: “I feel that learning is purposeful when I see my subject teachers teach with enthusiasm. Teachers are in the position to help me to love my studies and develop a good work ethic.” Most students expressed the view that they need the teachers to give them feedback and help them to move from simple to more difficult problems in their homework.

While it is true that teachers have always played a key role in traditional school settings for guiding students’ personal growth and academic performances, the blended classroom increases the opportunities for teacher-student communication, and produces multi-level ways for teachers to direct students’ learning. As Keshta & Harb (2013) described, the e-learning portal
can provide feedback to students anytime and anywhere. The following survey summarized teachers’ and students’ attitudes regarding the benefits and numerous ways the blended learning classroom contributed to students’ learning, engagement, motivation, and collaboration in the hybrid classrooms.
### Chart 16: Comparing Findings on Teachers’ and Students’ Attitudes towards Blended Instructions

<table>
<thead>
<tr>
<th>Student Responses to Post-Interview Questionnaires</th>
<th>Student (N=77)</th>
<th>Teacher Responses to Post-Interview Questionnaires</th>
<th>Teacher (N=12)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(4.1) Offers both human support in FTF classroom and OL tools support</td>
<td>100%</td>
<td>(4.5) Flipping instruction increases both human support and online tools support to enhance learning and teacher-student interactions</td>
<td>100%</td>
</tr>
<tr>
<td>(4.4) Integrating OL resources via flipping instruction enriches in-class instruction</td>
<td>100%</td>
<td></td>
<td>92%</td>
</tr>
<tr>
<td>(4.2) Combines OL digital textbook-based instruction with classroom-based instruction</td>
<td>95%</td>
<td>(4.1) Flipping learning between FTF and OL maximizes Bloom’s Taxonomy applications</td>
<td></td>
</tr>
<tr>
<td>(4.3) Hybrid learning increases opportunities to cover required learning objectives</td>
<td>90%</td>
<td>(4.2) Digital design of the curriculum allows flexible delivery of instruction</td>
<td>100%</td>
</tr>
<tr>
<td>(5.1) Most students need more support while reading complex texts</td>
<td>90%</td>
<td>(4.4) Increases student autonomy: Student may spend more time online on particular topics that require additional time to learn and understand during the OL session</td>
<td></td>
</tr>
<tr>
<td>(5.2) Most students need the support of a well-designed Literacy Program for improving reading skills for application on reading higher grade-level literature</td>
<td>96%</td>
<td>(4.3) Integrating differentiated instruction using online resources enhances pedagogy to meet different learning objectives</td>
<td>92%</td>
</tr>
<tr>
<td>(4.5) Enhances teacher to student connectivity between FTF and OL communication</td>
<td>99%</td>
<td>(1.2) BL approach is supportive in helping students improve different forms of literacy skills through exposure to a variety of online resources</td>
<td>92%</td>
</tr>
</tbody>
</table>
5.4.5 Consistency in Pedagogy and Blended Technologies Training

Part of the blended learning program plan was to include a monthly professional development session in the areas of pedagogy and technologies. All of the participant teachers believed that professional training was necessary for teachers to learn how to establish quality control for their instruction, and to support students in developing skills and abilities to become better learners. This attitude is supported by many empirical studies conducted on the theme of pedagogical education and reform in the e-learning era (Anderson & Dexter, 2005; Ellis & Calvo 2007; Chang, 2011). Especially in the areas of instructional strategies, teachers wanted training to improve strategies on how to balance instruction and activities between the two learning platforms and how to assign appropriate activities that are applicable for the blended students. As a result of these regular training opportunities provided for both teacher and student, no one encountered any major problems in using the new technologies. By the 2nd term, students and teachers became proficient users of the web-based course site.

5.4.6 Parents Supported the Blended Learning Literacy Program

Almost all parents believed that technology integration is desirable to prepare students for college and professional life. Parents believed that their children need a balanced literacy educational program. “I hope the blended learning program, with the goal of creating balanced literacy across content subjects, will make reading easier for her” (Parent of one 11th grade student). (Ref. 2.14, Graph 14, 15)
5.5 Summary

As stated previously, the purpose of this case study was to investigate the application of a teacher-developed blended learning instructional model for building reading comprehension skills to develop students’ literacy ability towards improving performance in four content areas: English, Social Studies, Math, and Science. In this research study, data contributed to documenting the research results were gathered from multiple channels including personal interviews, class observations, and class activities in the online and face-to-face blended classrooms, teachers’ focus group, and students’ performance grade reports at the end of the spring and fall terms. A case-study design and a mixed methodology were used to accomplish the research findings. The role of the qualitative data analysis was to provide a specific detailed report about participant teachers and students, including their value beliefs, perceptions, and opinions regarding the blended learning and strategies. The goal of the quantitative analysis was to cross-reference with the qualitative findings. The combined methods of both analyses seemed to confirm the researcher’s initial hypothesis that the effective use of blended learning instruction had a positive impact on students’ literacy proficiency in four academic subjects: English, Social Studies, Math, and Science.

In summary, the qualitative and quantitative data analysis are fully in accordance with views expressed by these authors (Lim & Morris, 2009; Taylor & Parsons, 2011; Caravias, 2014; Codreanu, Chein, & Robin, 2013), who believed that student performances are contingent on motivation, curriculum, appropriate course design, and above all else, the genuine dedication and leadership of caring teachers who have the ability and skills to inspire and sustain students’
eagerness to learn, improve, and make progress. In brief, Caravias (2014) emphasizes that blended learning environment is a connecting link between teachers and students, and between learners and the world of knowledge. The conclusion of this research study confirmed the current notion reported by most empirical studies conducted at higher education institutions that blended learning increases class participation, inspires deeper intrinsic motivation, and improves the quality of teacher and student commitment.
CHAPTER 6: SUMMARY, CONCLUSIONS, LIMITATIONS, AND IMPLICATIONS

6.1 Brief Summary of the Research Study

After an extensive review of the data results, the researcher found that seventy-seven participant students demonstrated an outstanding record, showing achievement gains of five to sixteen times in the corresponding subjects of English, Social Studies, Math and Science at the end of the school year 2013-2014. Students showed significant performance progress on overall mean scores in Term 2 over Term 1 as both participant teachers and students became more proficient in applying the blended instruction in the e-learning environment, and students began to experience the benefits and advantages of the blended classroom. Classroom observations and conversations with staff and students revealed overwhelming enthusiasm about the “flipped classroom” instructional and learning strategy as a means to improve literacy skills in the study of the English language as well as gaining deeper comprehension in the high school’s core subjects. Teachers and students admitted that the blended classroom has introduced a new approach to instruction and presented creative ways of learning via self-directed activities, online video, and the use of digital-based materials, which made it flexible and convenient for students engaged in learning any subject any time they have access to the Internet without the burden of carrying heavy textbooks or learning course notes. In the blended classroom, teachers can use class time to engage students with theme-based interactive activities directing students to exercise higher levels of thinking skills, analysis, and synthesis. After experiencing the blended classroom for a year, teachers concluded that blended strategies allowed more time for conceptual instruction by having students come to class better prepared with pre-assigned online readings. On the same plane, students are happy with the paperless learning culture because they do not have to carry
the heavy, hard copy textbooks any more, as they have turned digital. The shift to digital learning in the e-learning generation enables individuals to extend learning outside of the classroom settings and enjoy the freedom of creating a self-pacing learning schedule. The blended classroom represents the new student-centered instructional and learning model. This study confirmed the current notion reported by most empirical studies that blended learning with its rich e-learning, resources and multi-pathways of possibilities of acquiring information and knowledge, served to inspire individuals to become active learners, more motivated and better engaged in individual as well as in group learning. When students are motivated, it is easier to foster those learning virtues mentioned by Li (2013), which are so important for students’ personal and intellectual growth and development.

Data analysis also indicated that the parents’ voice is very much part of the learning experience of this research study because “Parents must help their children grow as persons, so that in due course they will also become productive, will reproduce, and will socialize (themselves and others). This process is called education: it is an essential mission of the family” (Bernal, Altarejos, & Rodríguez, 2008, p. 10). Parents’ questionnaires survey reflected their strong belief that parental involvement is crucial for their children’s education. As indicated in their responses, all parents agreed that the blended learning literacy program offers a great service to students in supporting content literacy improvement as well as preparing them for college studies and future professions. Eighty percent of the parents who responded to the questionnaires survey showed their interest in the Literacy Program. Although there were no commitments for participants to engage in the surveys, the research study was facilitated by 97% student and 100% (12) teacher participation in the post-interview surveys.
In the process of summarizing the research results, the researcher concluded several salient points about the successfully implemented Blended Learning Literacy Program. The researcher worked with teachers where each individual contributed to designing, developing and implementing the Blended Learning Literacy Program. The students’ academic success was attributed to their own efforts and to the quality instruction provided by teachers who had gained a large and substantial knowledge of blended theories and practices obtained from extensive literature studies and research findings. After explaining to students the importance of the Literacy Program, and the advantages and benefits of using blended methodologies, the majority of students and parents were ‘buying in’ to the program with great enthusiasm and expectations for success.

Several factors contributed to the effectiveness of the designing and implementation process. The decision to create an effective literacy program to support student achievements in content comprehension was derived from the obvious challenges that students had faced in reading complex texts with understanding, and to be able to intelligently analyze what they read and transfer what they learned into applicable knowledge in each content subject (Ackeman & Perkins, 1989). Therefore, teachers are charged with the task of educating, as the Latin word for education means, ‘to draw and to lead’ students to use reading strategies to connect reading and writing. Several literature readings were helpful for teachers to understand the relationships between reading and writing towards supporting students’ literacy improvement in reading content texts. This theme has been extensively handled by each of the following authors: Nuttall (1982), Heller & Greenleaf (2007), Kosanovich, Reed, & Miller (2010), Breeze (2012), Krasnova & Sidorenko (2013), Liu (2013). The research team also reviewed extensive literature on theories
related to the concept of knowledge, instructional designs, and applications of learning strategies in the blended environment. The work of Aristotle (2011), Piaget (1962, 1989), Gardner (2006, 2011), and Thorndike (1831) are some of the outstanding writings for inspiring teachers with a holistic and comprehensive view of education.

The teachers’ review of blended learning definitions, concepts, environments, instructional designs, and instructional strategies was strongly supported by works written by these authors: Reigeluth (1999), Perkins (1999), Bonk (2004), Garrison & Vaughan (2008), Dzubian & Moskal (2011), Graham & Dziuban (2008), Staker & Horn (2012), and Staker et al. (2011). Readings on Instructional designs included works of Brooks & Brooks (1993), Perkin (1992, 1999), Biggs & Tang (2007), and Wiggins & Mctighe (1998, 2005). By having a grounded knowledge about instruction strategies related to student motivation, teachers were empowered to design effective lessons suitable for a blended learning class room for each particular curriculum area. Teachers also reflected on theories of behaviorism, cognitivist, and constructivism. These learning theories are guiding principles in applying Bloom’s Taxonomy of thinking skills and Merrill’s First Principles (2002, 2007) for effective strategies for scaffolding instruction with the focus of improving student motivation as voiced by a list of authors who wrote on these themes (Keller, 2008; Williams & Williams, 2011; Saeed & Zyngier, 2012; Gagne, 1977; Grolnick, Friendly, & Bellas, 2009). Additional recommendations supporting instruction and learning for enhancing motivation came from these researchers: Keller (2007), Young (2002, Precel et al (2009), and Vandemolen (2010).

The above body of literature was used as reference materials by teachers to conceptualize their own understanding of blended learning designs and applications in real-time
situations. Additionally, by capitalizing on the advantages and benefits that were already experienced by educators reflected in this huge body of evidence-based findings, teachers were able to avoid possible pitfalls and build their own instructions on the positive aspects of the blended classroom. Because empirical and scientific studies on blended learning are available from different countries, the researcher was able to focus attention not only on research work done in the United States, but also conducted in Europe, Middle East, Africa, and Asia in order to better perceive the influences of blended learning in other cultures. The following key points (Ref. 6.2) underscored what the researcher understood as important elements for contributing to a successful implementation process. These suggestions could be beneficial and replicable for educators and researchers who are planning to develop blended learning programs or courses in their high schools. The implementation process is inexpensive materially speaking because the Internet and teachers are the main driving forces. In most schools Internet access is already part of the academic system. In terms of human resources, they are never lacking in the academic world.

6.2 Concluding Statements

In the process of summarizing the research results, the researcher was able to draw up a list of several salient points about the successful implementation of this Blended Learning Literacy Program. The researcher believed that the strengths and the positive input of all participants in this case study were due to the high quality research process planned by the research team.
6.2.1 Point 1: Establishing a shared vision and common goal for all participants

The first workshop took place one month before the launching of the blending plan in which teachers reviewed literature on language literacy, learning, digital technologies, definitions of blended learning, instructional designs of blended models, effective instructional strategies, and the constructive learning paradigm environment. Teachers were able to conclude this workshop with a shared, comprehensive, and holistic vision on education to establish a common purpose and goal for the implementation of the Literacy Program using blended learning instruction. As the result of attending this workshop, teachers were able to set the stage for optimal conditions for achieving success. Therefore, this preliminary study initiative is essential for a blended learning project.

6.2.2 Point 2: Collaborative efforts of teachers, students, and the technology coordinator

In this study, the opinions and suggestions of all users including the Tech Coordinator of the school were important for the organization of the flexible blended learning design. Teachers were open to suggestions from other teachers, students, and parents, and the Technology Coordinator was ready to provide technology support during the implementation process.

6.2.3 Point 3: Effective integration of the planning, development, and implementation process

The Research Team established the following organization plan to achieve the program objectives and goals:

(1) Teachers set up the reading performance standards, learning objectives, rubrics for class guidance, and online instruction syllabus.
(2) Teachers reviewed the digital textbook curriculum and shared among themselves their self-developed curriculum webpages.

(3) Teachers agreed on the learning objective goals and the six reading comprehension strategies for each subject for the aim of assessing reading and writing performance.

(4) Teachers agreed about using Bloom’s levels of thinking skills to assess students’ cognitive development in English literacy and content comprehension.

(5) Teachers constructed a flexible blended learning model based on research-based findings, and most importantly on students’ needs and suggestions. Teachers met regularly to assess the effectiveness of the learning model to improve the quality of teaching and learning.

6.2.4 Point 4: Developing a technology training plan for instructors and users

Teachers shared literature findings with students related to blended learning instruction and learning, and discussed also how blended instruction would be implemented in the face-to-face and online activities to establish a common understanding between instructors and users. As students moved between face-to-face and online classes, they were guided by the standardized benchmark and rubric for measuring performance progress towards goal achievements in each subject area at grade level.

6.2.5 Point 5: Fostering teachers’-parents’ partnership

Adolescent students need support to prioritize life’s values under the guidance of both parents and teachers in their high school years. Their academic decisions required input and feedback from teachers and parents. Parents usually have deeper expectations than just the pragmatic concerns of intellectual pursuits and academic excellence. Most of them are interested
and concerned with their children’s college readiness or having a promising career down the road. They are also concerned if teachers are able to foster in their children the learning virtues and good working habits useful for sustaining short-term and long-term learning success in future situations.

In conclusion, the researcher believes that this research study is unique in three aspects. First, it was a bold attempt to evaluate the impact of blended learning not just in one subject, but in four contents areas, examining every student who participates in four content subject performances in a high school setting. Second, the researcher personally supervised a group of teachers to design and develop the blended literacy program. These were the same participant teachers as those teaching the participant students. Therefore, the researcher was in the position to obtain first hand immediate feedback from participant teachers and students, and parents of the participant students throughout the entire research period. Third, the researcher took a strong interest and valued highly parents’ opinions on educational issues related to their children’s education. To sum up, the researcher conducted this study with a holistic approach with respect to educational theories and practices in the field of instructional technologies and learning.

6.3 Limitations

The current study has a few limitations: (1) the participants group had only seventy-seven students enrolled in this blended program. The non-blended program teachers and students were not interviewed nor surveyed. Therefore, the views of non-participants were not considered. (2) Program participants were limited to only 10th, 11th, and 12th grades. The 9th grade
students were not included in the study. (3) The qualitative part of the study examined the changes on teachers’ and students’ perceptions and attitudes between Term 1 and Term 2 for only one year. Longer-term studies are needed to find out if the gains can be maintained, and if the improvement is lasting. (4) Most case studies used for reviewing and comparing were conducted in higher education settings. In order to establish more evidence-based results for the benefits of using blended learning in secondary schools, more comparisons must be used with evidence-based research findings related to high school programs. Furthermore, more research should tap into new technology trends that are emerging within the entire learning community at a rapid pace: Flexible learning, M-Mobile learning, Flipping classroom, use of social media such as YouTube, and iPad in the classrooms, educational games, and apps for educational purpose. Again, many articles have been written on these topics, but all of these educational means for instruction and learning require more evidence-based research.

6.4 Implications

Based on the experiences of this research study, student perceptions regarding quality teaching and learning provided a well of knowledge for teachers to examine their leadership role, and to help them design learning activities and modify instructional strategies from the lenses of students’ perspectives to make learning truly student-centered. Newer technologies continue to appear and replace the older ones. The researcher recommends additional research into designing the best support for both teachers and students in terms of integrating and constantly updating technologies in teaching and learning. Most educational research, including our current study, is concerned with investigating the sociological aspects of education, which contribute to
increase information and knowledge related to how the most advanced technology tools, can be applied for enhancing student academic performance and progress. Literature reviews for this study brought the researcher’s attention to the limited amounts of research conducted from global perspectives showing just how new technologies could serve as a favorable medium for human development to benefit oneself and also the common good of humanity. Students must know that technology is not just a goal in itself but a means to higher goals. For example, Naval et al. (2011) pointed out the importance of promoting social commitment among young people by incorporating ethical and civic education in the curriculum.

Teachers have students abreast of the sociological phenomena that have an impact on intellectual achievement. Alongside that, teachers must also educate students about the basic ethical principles that are guiding milestones for human actions. Teaching is an extremely valuable professional activity endowed with the responsibilities of educating and forming. Teachers’ responsibilities begin in the classroom but go far beyond it in the formative task of educating youth as citizens of a global culture.

Parents’ responses to our questionnaire survey indicated similar concerns. Parents are preoccupied with their children’s intellectual growth, as well as character and moral formation. As Naval pointed out, in order to promote social commitment among young people, it is necessary to include ethics and civics education in the teachers’ and students’ academic curriculum. In concrete terms, more research studies are needed on designing workshops not only at the faculty level, but also professionally conceived at the student level.
With respect to possible future research on instructional technologies, the researcher recommends that investigation should be carried out in the following areas in order for everyone to derive the maximum benefit from the new technologies.

- 1. Use of games and simulation in educational settings
- 2. Web 2.0 integration in the blended classroom
- 3. Web 3.0 technology in education and in professional work
- 4. Use of the Cloud technology in learning
- 5. Expanding Social Media as a learning tool
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APPENDIX
APPENDIX A

A. PARENT’S CONSENT LETTER

METROPOLITAN ACADEMY

May 15, 2013

Dear Parents and Program Participants:

Beginning in the fall of 2013, four subject departments will begin a Pilot Literacy Program to address the learning needs of our students. A Program Orientation Day will be scheduled on Tuesday, August 21, 2013. All parents and students are welcome to attend. In an effort to improve the quality of instruction and learning of this undertaking, teachers and students enrolled in this program will be invited to participate in personal interviews and surveys. Your input is very important to us. Interviews and surveys will be kept strictly confidential and used only for the purpose of this research study.

Meanwhile, please take time to consider the following options and return this letter with your parents’ signatures to the program office within two weeks.

Options:

1. _____ Yes, I would like to enroll in the Literacy Program and participate in interviews and surveys.
2. _____ Yes, I would like to enroll in the Literacy Program, but prefer not to participate in any interviews and surveys.
3. _____ No, I will not enroll in the Literacy Program this year.

Thank you for your anticipated participation. If you have any questions please call Ms. Hui, room 206.

________________________   ______________________
School Director Macy Hui         Parents Signature
B. LETTER OF APPRECIATION TO PARTICIPANT TEACHERS

August, 1, 2013

Dear Participant Teacher ______________

Congratulations to all of you who had expressed your desire to participate in our Blended Learning Research Project as part of our school plan to improve student outcomes. In order to set high expectations for our students, and also provide continuous instructional professional development for content subjects teachers, we have designed a series of Professional Development workshops with a focus, in part, on the use of technology to assist literacy and numeracy instruction.

Twelve teachers have voluntarily committed to take part in this Blended Learning Project and in this series of workshops. The workshop coaches are diligently preparing a year-long program on inquiry-based instruction, differentiated instruction, and behaviour management strategies for participant staff. We have also initiated a series of scheduled walk-throughs to collect low inference data on everything from opening procedures/routines, development of lesson, closing procedures/routines, questioning techniques, and evidence of inquiry. The goal would be to support teachers in developing an array of instructional strategies to apply in the Blended Classroom in preparation for the implementation of the teacher-designed Blended Learning Model.

This research project follows the ethical procedures of American Psychological Association (APA) guidelines. The researcher will conduct personal interviews with teachers, students, and parents, as well as perform observations on classroom instruction and students’ class activities. All participants, including students, teacher and the school would remain anonymous in all research reports. All data reports collected and audio recordings will be kept confidential, available only to the researcher and the research team members.

Before launching the research, I would send a letter to inform parents and guardians about the Blended Learning Research Project and offer each participant family the opportunity to participate or refuse to participate in this Blended Learning Literacy Program. Throughout the research teachers and students would be invited to assist in the interviews on a voluntary basis.

By participating in this initiative, every teacher is contributing to a project that will deepen our understanding of how our students learn, thus developing alternative ways of improving students’ success in the future. Again, thank you for the great job that you do daily with our students.
I look forward to working with you in this exciting research study. 
Yours sincerely,

Macy Hui  
School Director
## C. ENGLISH LITERACY PERFORMANCE AND READING COMPREHENSION RUBRICS

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<thead>
<tr>
<th>Topic</th>
<th>Rating</th>
<th>Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>Main Idea</td>
<td>4 3 2 1</td>
<td>Identification of main idea with supporting details is:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>✓ Successful and Extensive</td>
</tr>
<tr>
<td></td>
<td></td>
<td>✓ Successful and Considerable</td>
</tr>
<tr>
<td></td>
<td></td>
<td>✓ Acceptable and Adequate</td>
</tr>
<tr>
<td></td>
<td></td>
<td>✓ Missing and/or Unsuccessful</td>
</tr>
<tr>
<td>Critical Thinking</td>
<td>4 3 2 1</td>
<td>Understanding and applying concrete and abstract ideas are:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>✓ Commendable</td>
</tr>
<tr>
<td></td>
<td></td>
<td>✓ Effective</td>
</tr>
<tr>
<td></td>
<td></td>
<td>✓ Suitable</td>
</tr>
<tr>
<td></td>
<td></td>
<td>✓ Limited</td>
</tr>
<tr>
<td>Connections</td>
<td>4 3 2 1</td>
<td>Connections both within the text and to previous knowledge are:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>✓ Exceptional</td>
</tr>
<tr>
<td></td>
<td></td>
<td>✓ Effective</td>
</tr>
<tr>
<td></td>
<td></td>
<td>✓ Suitable</td>
</tr>
<tr>
<td></td>
<td></td>
<td>✓ Minimal</td>
</tr>
<tr>
<td>Vocabulary</td>
<td>4 3 2 1</td>
<td>Demonstration of understanding of words in a given context is:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>✓ Commendable</td>
</tr>
<tr>
<td></td>
<td></td>
<td>✓ Effective</td>
</tr>
<tr>
<td></td>
<td></td>
<td>✓ Suitable</td>
</tr>
<tr>
<td></td>
<td></td>
<td>✓ Limited</td>
</tr>
</tbody>
</table>

4 = Exemplary, 3 = Proficient, 2 = Satisfactory, 1 = Unsatisfactory

Raw Score:_______ Adjusted Score:_________
# APPENDIX D

## D. ESSENTIAL COMPONENTS EVALUATING STUDENT READING COMPREHENSION ABILITY

<table>
<thead>
<tr>
<th>ESSENTIAL ELEMENTS</th>
<th>4 EXEMPLARY</th>
<th>3 PROFICIENT</th>
<th>2 SATISFACTORY</th>
<th>1 UNSATISFACTORY</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Main Idea</strong></td>
<td>Identification of main idea with extensive use of supporting details.</td>
<td>Identification of main idea with considerable use of supporting details.</td>
<td>Identification of main idea with adequate use of supporting details.</td>
<td>Partial identification of main idea with limited supporting details.</td>
</tr>
<tr>
<td><strong>Critical Thinking</strong></td>
<td>Commendable understanding of abstract and concrete ideas.</td>
<td>Effective understanding of abstract and concrete ideas.</td>
<td>Suitable understanding of abstract and concrete ideas.</td>
<td>Limited understanding of abstract and concrete ideas.</td>
</tr>
<tr>
<td><strong>Connections</strong></td>
<td>Exceptional ability to make connections both within the given text and to previous knowledge.</td>
<td>Effective ability to make connections both within the given text and to previous knowledge.</td>
<td>Suitable ability to make connections both within the given text and to previous knowledge.</td>
<td>Minimal ability to make connections both within the given text and to previous knowledge.</td>
</tr>
<tr>
<td><strong>Vocabulary</strong></td>
<td>Commendable demonstration of understanding vocabulary in given context.</td>
<td>Effective demonstration of understanding vocabulary in given context.</td>
<td>Suitable demonstration of understanding vocabulary in given context.</td>
<td>Suitable demonstration of understanding vocabulary in given context.</td>
</tr>
</tbody>
</table>
E. THE ENGLISH ONLINE DIGITAL TEXTBOOK WINDOW FOR ALL GRADE LEVELS


McDougal Littell Literature, Grade 12 English Literature

**Literature and Reading** contains hyperlinks to the following sections: (1) Author Online (2) Selection Background (3) Analysis Frames (4) NovelWise (5) The Listening Center.

(1) The Author Online includes a series of studies for selected authors and more author biographies organized by alphabetical order.

(2) Selection Background includes additional background information for selected literary works.

(3) Analysis Frames provides students with tools for analyzing literature of different genres.
(4) Novel Wise supports students with a set of tools to analyze, evaluate, and appreciate novels from classics to modern bestsellers.

(5) The Listening Center is equipped with audio recordings and summaries of key literature selections.

**Writing and Grammar** contains hyperlinks to the following sections: (1) Grammar Arcade (2) Writing Templates (3) Graphic Organizers (4) Publishing Options (5) Essay Smart.

(1) **Grammar Arcade** contains interactive games to test the individual’s grammar skills such as sentence fragments, run-on sentences, subject-verb agreement, Pronoun reference problems, incorrect pronoun case, who, whom, and what; this and that, making comparisons, verb forms and tenses, modifiers, and missing or misplaced commas.

(2) **Writing Templates** consist of over 20 different writing forms, such as persuasive essay and process description.

(3) **Graphic Organizers** contain graphic frames for organizing ideas, such as flow chart, classification chart, character profile, cause and effect chain, observation chart, cluster diagram, and spider map, etc.

(4) **Publishing Options** indicate where to submit one’s own writing for publication. Publishing options include sites, such as Amazing Kids, Writer’s Library, Young Writer Resources, Young Writers’ Clubhouse, and Young Writers Society.

(5) **Essay Smart** allows students to access online books, activity maker, and other interactive feature provided by Essay Smart site. Teachers have to register the students and provide the Username and Password for students to gain entrance into this link.

**Vocabulary** contains hyperlinks to the following sections: 1. Vocabulary Practice: Flash Cards, 2. Vocabulary Practice: Interactive Games, 3. Activity Maker.

(1) **Vocabulary Practice**: Flash Cards. The figure below illustrates an audio flash card from the book *Araby* by James Joyce. *(Picture A)*
Picture A: Window for Vocabulary Practice in the English Class

The flash card defines the vocabulary ‘Garrulous’, and provides the students with the audio pronunciation of the word and its definition.

(2) Vocabulary Practice: Interactive Games.

The following is an example of the interactive game: “Word Scramble”.

User is asked to rearrange the order of the alphabets to obtain the correct vocabulary.

For Example: The correct word Pervade came out when the given letters ‘Pdvreea’ are properly arranged.
Window for Vocabulary Practice Using Interactive Games

(3) Activity Maker

Students use the activity maker template to create vocabulary learning activities.


(1) **Production Templates & Project Ideas** provide students with tools for developing their own media projects.

(2) **Media Analysis Guides** offer students tools for becoming a critical media viewer.

(3) **Media Links** offer recommendation of links to media literacy sites.

(4) **Crossword Puzzles** consist of review key media terms, such as Film and TV Puzzle, News Puzzle, and Advertising Puzzle.

**Assessment** contains hyperlinks to the following sections: 1. ACT/Sat Test Taking Strategies, 2. SAT Links, 3. SAT/ACT Flash Cards.

(1) **ACT SAT Test Taking Strategies** provide test-taking tips and practice tests for the SAT and ACT.

(2) **SAT Links** give helpful links to SAT sites.

(3) **SAT/ACT** Flash Cards offer interactive flash cards for 30 weeks of SAT vocabulary practice.
Research includes two sections: (1) Web Research Guide (2) Citation Guide

(1) Web Research Guide provides students with the strategies and tips for conducting online research links to guides for citing research sources according to Modern Language Association (MLA), and American Psychological Association (APA).

(2) Citation Guide offers links for citing research sources based on MLA and APA styles.

Citation Styles http://www.cws.illinois.edu / workshop / writers / citation /

The Center for Writing Studies at the University of Illinois at Urbana-Champaign has an online Writing Workshop with resources for student writers. Go to the Writing Workshop page and click on "Citation Styles," then "Modern Language Association" for MLA citation styles. You can also view the APA styles (American Psychological Association), if this is what your teacher requires.

The Columbia Guide to Online Style, second edition http://www.columbia.edu / cu / cup / cgos2006 / basic.html This is an online version of Columbia University's style guide for citations of Internet sources. While not as complete as the print version, this site nonetheless contains many useful examples.

Online! A Reference Guide to Using Internet Sources http://www.bedfordstmartins.com / online / citex.html his online book provides detailed advice about finding, using, and citing Internet sources. It includes the MLA style guides to internet citations as well as several other style guides.

Paradigm Online Writing Assistant http://www.powa.org /

The online writing assistant will help you through any number of writing assignments: informal essays, argumentative essays, and expository essays, to name a few. You can also learn how to write a thesis and how to correctly document sources.

(Retrieved from McDougal Littell Literature ClassZone Site)

http://www.classzone.com/cz/books/ml_lit_gr12/page_build.htm?id=resources/jsp/citation_guide/citation_guide&htl=ml_lit_gr12

11th Grade Digital Curriculum

You will see the following display in the CLASSZONE page
Online (Students need to activate their ID and Password in the following link.) http://www.classzone.com/cz/login.htm?redirectUrl=http://www.classzone.com:80/cz/books/ml_lit_gr11/secured/resources/applications/ebook/index.jsp

<table>
<thead>
<tr>
<th>Literature Reading</th>
<th>Writing &amp; Grammar</th>
<th>Vocabulary</th>
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<tr>
<td><strong>Author Online</strong></td>
<td><strong>Grammar Arcade</strong></td>
<td><strong>Vocabulary Practice:</strong> Flash Cards</td>
</tr>
<tr>
<td><strong>Selection Background</strong></td>
<td><strong>This is your link to Grammar, Writing, and Communication Chapter 1-32</strong></td>
<td><strong>Vocabulary Practice:</strong> Interactive Games</td>
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<tr>
<td><strong>Analysis Frames</strong></td>
<td><strong>Writing Templates</strong></td>
<td><strong>Activity Maker</strong></td>
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<td><strong>Novel Wise</strong></td>
<td><strong>Graphic Organizers</strong></td>
<td><strong>Publishing Options</strong></td>
</tr>
<tr>
<td><strong>The Listening Center</strong></td>
<td><strong>EssaySmart</strong></td>
<td><strong>EssaySmart</strong></td>
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### Media
- **Production Templates & Project Idea**
- **Media Analysis Guides**
- **Media Links**
- **Crossword Puzzles**

### Assessment
- **SAT/ACT Test-Taking strategies**
- **SAT Links**
- **SAT/ACT Flash Cards**

### Research
- **Web Research Guide**
- **Citation Guide**

### 12th Grade Digital Curriculum

**Assessment Review Link:**
- [http://www.testprepreview.com/common-core-test-prep.htm](http://www.testprepreview.com/common-core-test-prep.htm)

**Publisher:** McDougal Littell (2001). Each textbook includes both Teacher Edition and Student Textbook:
Online (Students need to activate their ID and Password in the following link.)

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<th>Literature Reading List</th>
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<td>The Listening Center</td>
<td>Publishing Options</td>
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<tr>
<td>Media Production Template &amp; Project Ideas</td>
<td>EssaySmart</td>
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**Research**

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</table>

**Additional Site for review:**

http://www.regentsprep.edu
http://www.nysedregents.org/ComprehensiveEnglish/
http://www.barronsregents.com/
These are 100 Recommended Readings for High School Students that you can read throughout your high school years.
http://www.goodreads.com/list/show/478.Required_Reading_in_High_School
www.goodreads.com/list/show/1757.Best_Books_to_Teach_in_high_school

Supplementary Course Reading List for grade levels 10TH, 11TH, and 12TH

10th Grade English Reading List – Level III and Level IV

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<td>Fahrenheit 451</td>
<td>Ray Bradbury</td>
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<tr>
<td>Night (The Night Trilogy)</td>
<td>Elie Wiesel</td>
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<td>The Great Gatsby</td>
<td>F. Scott Fitzgerald</td>
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<td>J. D. Salinger</td>
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<td></td>
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<tr>
<td>A Yellow Raft in Blue Water</td>
<td>Michael Dorris</td>
</tr>
<tr>
<td><a href="http://en.wikipedia.org/wiki/A">http://en.wikipedia.org/wiki/A</a> Yellow Raft in Blue Water</td>
<td></td>
</tr>
<tr>
<td>Snow Falling on Cedar</td>
<td>David Guterson</td>
</tr>
<tr>
<td><a href="http://en.wikipedia.org/wiki/Snow_Falling_on_Cedars">http://en.wikipedia.org/wiki/Snow_Falling_on_Cedars</a></td>
<td></td>
</tr>
<tr>
<td>Death of a Salesman</td>
<td>Arthur Miller</td>
</tr>
</tbody>
</table>

Heart of Darkness

Robert Frost’s Poem
http://www.poemhunter.com/robert-frost/

11th Grade English Reading List – Level V and Level VI

Course Reading List

<table>
<thead>
<tr>
<th>Title</th>
<th>Author</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dust Tracks on a Road <a href="http://en.wikipedia.org/wiki/Dut_Tracks_on_a_Road">http://en.wikipedia.org/wiki/Dut_Tracks_on_a_Road</a></td>
<td>Hurston, Zora Neale</td>
</tr>
<tr>
<td>I Am One of you Forever <a href="http://lsupress.org/books/detail/i-am-one-of-you-forever/">http://lsupress.org/books/detail/i-am-one-of-you-forever/</a></td>
<td>Chappell, Fred</td>
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<tr>
<td>Main Street, <a href="http://en.wikipedia.org/wiki/Main_Street">http://en.wikipedia.org/wiki/Main_Street</a></td>
<td>Lewis, Sinclair</td>
</tr>
<tr>
<td>Praying For Sheetrock (nonfiction) <a href="http://en.wikipedia.org/wiki/Melissa_Fay_Greene">http://en.wikipedia.org/wiki/Melissa_Fay_Greene</a></td>
<td>Greene, M.</td>
</tr>
<tr>
<td>The Unvanquished <a href="http://en.wikipedia.org/wiki/The_Unavanquished">http://en.wikipedia.org/wiki/The_Unavanquished</a></td>
<td>Faulkner, William</td>
</tr>
<tr>
<td>A Walk Across America (nonfiction) <a href="http://en.wikipedia.org/wiki/Peter_Jenkins_(travel_author)">http://en.wikipedia.org/wiki/Peter_Jenkins_(travel_author)</a></td>
<td>Jenkins, Peter</td>
</tr>
<tr>
<td>Walking Across Egypt <a href="http://en.wikipedia.org/wiki/Walking_Across_Egypt">http://en.wikipedia.org/wiki/Walking_Across_Egypt</a></td>
<td>Edgerton, Clyde</td>
</tr>
</tbody>
</table>
DRAMA

<table>
<thead>
<tr>
<th>Title</th>
<th>Author, Year</th>
</tr>
</thead>
</table>

**12th Grade English Reading List – Level VII and Level VIII**

**Course Reading List**

Reading for 12th Grade students includes different areas of literature:

1. Shakespeare and other Literature

   a. *Macbeth* - the story of a king who is murdered and the consequences thereof.
   b. *Merchant of Venice* - the story of a man experiencing financial troubles who engages in a competition for a woman’s hand in marriage.
   c. *Othello*  
      Desdemona marries Othello, a man who is not the same race, family chaos ensues; Othello is driven by jealousy, tragedy ensues.
   d. *The Tempest*  
      A man and a daughter witness a horrible shipwreck, and the man, Prospero, explains to his daughter their history on the island and demonstrates his magical powers.
   e. *Twelfth Night*  
      A shipwrecked woman, Viola, disguises herself as a man and this leads to a strange love triangle where she’s in love with a man, Orsino, and a woman is in love with her, Olivia.

**Classical Literature suggestions:**
a. Charles Dickens’ Great Expectations - A boy falls in love with a wealthy girl and spends his life trying to impress her. 
   http://en.wikipedia.org/wiki/Great_Expectations

b. George Orwell – Animal Farm
   http://en.wikipedia.org/wiki/Animal_Farm Animals take over the farm in order to gain more rights or the world is constantly monitored by Big Brother.

c. Dante – Inferno, http://en.wikipedia.org/wiki/Dante_Alighieri Everyone is punished in hell according to his or her sins in life, and Dante is given a Tour by the poet Virgil.

   What happens when the devil makes you a deal you can’t refuse? Oscar Wilde - The Picture of Dorian Gray Dorian Gray is absolutely beautiful and because of his pride and narcissism, makes a deal to have his portrait age, while he remains young throughout time.

e. Kafka - Metamorphosis - What would you do if you woke up as a bug?
   www.gutenberg.org/5200/5200h/5200-h.htm

f. Camus - The Stranger - Meursault finds out his mother has died, and becomes increasingly detached from the world as he moves through it.
   http://en.wikipedia.org/wiki/Albert_Camus

g. Joseph Conrad - Heart of Darkness - Slip into the depths of insanity as this man descends deeper into the jungles of Africa.

h. Charlotte Bronte - Jane Eyre - Learn about a woman who struggles through childhood yet has a strong will to remain a morally good woman
   http://en.wikipedia.org/wiki/Jane_Eyre

i. Cervantes - Don Quixote - Possibly the first significant novel, this is a satire. Catch yourself chuckling when Don Quixote decides to live out the life of a hero and attempts to do battle with windmills.
   http://en.wikipedia.org/wiki/Miguel_de_Cervantes

j. Mary Shelly - Frankenstein - What happens when Dr. Frankenstein decides to craft a creature and bring him to life? Find out in this chilling tale.
   http://en.wikipedia.org/wiki/Frankenstein

2. Historical, Philosophical, and Culturally Significant Books

   a. Ralph Waldo Emerson Self-Reliance and other
b. John Stuart Mill On Liberty and Other Essay,  

c. Henry David Thoreau Walden and Civil Disobedience  

d. Henry Adams The Education of Henry Adams  

e. Boethius The Consolation of Philosophy  

f. St. Augustine The City of God  
   http://www.britannica.com/EBchecked/topic/119060/The-City-of-God

g. Mary Wollstonecraft A Vindication of the Rights of Women  

3. Modern Classics of 12th Graders

h. The Bell Jar by Sylvia Plath  
   http://en.wikipedia.org/wiki/The_Bell_Jar

i. Things Fall Apart by Chinua Achebe  
   http://en.wikipedia.org/wiki/Things_Fall_Apart

j. Night by Elie Wiesel  
   http://en.wikipedia.org/wiki/Elie_Wiesel

k. A Million Little Pieces by James Frey  
   http://en.wikipedia.org/wiki/A_Million_Little_Pieces

l. How the Garcia Girls Lost Their Accents by Julia Alvarez  
   http://en.wikipedia.org/wiki/How_the_Garc%C3%ADa_Girls_Lost_Their_Accents

m. The Catcher in the Rye by J. K. Salinger  
   http://en.wikipedia.org/wiki/The_Catcher_in_the_Rye

n. Grendel by John Gardner  

o. Song of Solomon by Toni Morrison  

p. The Unbearable Lightness of Being  

q. The Chosen by Chiam Potok  

r. Catch 22 by Joseph Heller  

s. Life of Pi by Yan Martel  

t. One Hundred Years of Solitude by Gabriel Garcia Marquez  
   http://en.wikipedia.org/wiki/One_Hundred_Years_of_Solitude

u. The Thorn Birds by Colleen McCullough  
   http://en.wikipedia.org/wiki/The_Thorn_Birds
4. Poets for All 12th Graders

h. Maya Angelou I Shall not be Moved http://en.wikipedia.org/wiki/I_Shall_Not_Be_Moved_(poetry)

5. Dramatists

a. Arthur Miller’s The Crucible or Death of a Salesman, b. Henrik Ibsen’s A Doll’s House
e. George Bernard Shaw Pygmalion http://en.wikipedia.org/wiki/Pygmalion_(play)
g. Aeschylus Prometheus Bound http://en.wikipedia.org/wiki/Prometheus_Bound
j. Tom Stoppard Rosencrantz and Guildenstern are Dead http://en.wikipedia.org/wiki/Rosencrantz_and_Guildenstern_Are_Dead
k. Tennessee Williams A Streetcar Named Desire or Cat on a Hot Tin Roof http://en.wikipedia.org/wiki/Tennessee_Williams
6. College Bound website:
http://als.lib.wi.us/Collegebound.html. The College Board website includes a recommended literature reading list of work from these categories: American, World, Biography, History, Science, Social Science Drama, and Poetry.

Additional References for All Grade Levels: AP English Reading List:

I Know Why the Caged Bird Sings by Maya Angelo
http://en.wikipedia.org/wiki/I_Know_Why_the_Caged_Bird_Sings

Pride and Prejudice by Jane Austen
http://en.wikipedia.org/wiki/Pride_and_Prejudice

Wuthering Heights by Charlotte Bronte
http://en.wikipedia.org/wiki/Wuthering_Heights

Red Badge of Courage by Stephen Crane

Tale of Two Cities by Charles Dickens

Invisible Man by Ralph Ellison

Crime and Punishment by Fyodor Dostoyevsky

The Great Gatsby by F. Scott Fitzgerald

Profiles in Courage by John F. Kennedy
http://en.wikipedia.org/wiki/Profiles_in_Courage

A Death in Venice by Thomas Mann

The Collected Poems by Sylvia Plath

Catcher in the Rye by J.D. Salinger
http://en.wikipedia.org/wiki/The_Catcher_in_the_Rye

Of Mice and Men by John Steinbeck
http://en.wikipedia.org/wiki/Of_Mice_and_Men

Slaughterhouse Five by Kurt Von
http://en.wikipedia.org/wiki/Slaughterhouse-Five

For End-Term Preparation,
http://www.testprepreview.com/common-core-test-prep.htm
Activity Center includes four sections: (1) Activity Maker (2) Know Your States (3) Chapter Assessment Internet Activity (4) Power Point Guide

(1) The Activity Maker creates and displays flip cards, review games, and crossword puzzles. This section requires the teachers to provide the ID and PW for each student.

(2) Know Your States allows the students to test the U.S. geography knowledge with the fun interactive game.

(3) Chapter Assessment Internet Activity asks students what they already know. The student uses the Internet and the preselected Web sites provide in this center to complete the end-of-chapter Internet activity.
(4) The Power Point Guide teaches the students how to use the PowerPoint tool, such as creating audio-visual presentations. There are two hyperlinks to help student make powerful PowerPoint slides:

Download Microsoft in Education's comprehensive guide to PowerPoint 2000. The guide, in Microsoft Word format, is appropriate for high-school students and educators. It includes illustrated step-by-step instructions on how to create effective PowerPoint presentations as well as information on new features in PowerPoint 2000.

An illustrated online guide to basic PowerPoint tasks.

(5) Audio Downloads has an audio summary of every chapter to your iPod, MP3 player, or computer.

Map Center contains (1) The North and South American and the World Atlas (2) Online Maps (3) Map Websites

(1) The world atlas includes these subtopics: Human Emergence on Earth, World: Political and Physical, North America and South America Physical, Mexico, Central America, and the Caribbean: Political, Native America to 1525, United States: Political and physical, U.S. Territorial Expansion.

(2) Online Maps includes 31 blank maps template from different periods of the American history such as (Spain explores the Americas, 1500s; The 13 Colonies; Colonial Products; Mississippi River Drainage Basin, Pre-Revolutionary North America; North America, 1783, etc.) for students to create online activities.

(3) Map Websites links to a variety map specific websites such as:

Rand McNally http://www.randmcnally.com/
Online maps and more from a respected mapping company.

Google Maps http://maps.google.com/maps
Maps and satellite imagery for many different countries.
Perry-Castañeda Library Map Collection http://www.lib.utexas.edu/maps/historical/
A variety of scanned historical maps at the University of Texas at Austin.

A clickable map and time line for archaeological sites around the world.

From Education Gateway, covers the steps involved in the making of traditional maps.

From National Geographic. Thieves stole priceless maps from the Royal Geographic Society. Use knowledge of latitude and longitude to catch them.

A step by step guide to understanding how the Global Positioning System works.

A detailed overview of the Global Positioning System in text and illustrations prepared by the Department of Geography at the University of Colorado.

Links to a variety of maps and geography information for each of the states, territories, and commonwealths, and the District of Columbia.

What is the definition of latitude and longitude?, http://jwocky.gsfc.nasa.gov/teacher/latlonarchive.html
A detailed explanation of latitude and longitude, degrees, minutes, and seconds.

More about a variety of map projections.

A site with access to many maps and globes.

Online Map Creation http://www.aquarius.geomar.de/omc
Easy-to-use Web site for creating your own maps.

Download satellite images showing environmental change.
Use the Dynamic Maps area of this site to access satellite images of cities and regions.

**Review Center** provides (1) Chapter Quizzes (2) Crossword Puzzles (3) Flip cards

**(1) Chapter Quizzes** contains quiz practices for every chapter and unit. For example, the Crossword Puzzles (Picture C)

**Picture C: Window for Chapter Quiz on Social Studies Vocabulary**

**(2) Crossword Puzzles games** are provided for difficult vocabularies in each chapter.

**(3) Flip cards** are provided for students to quiz on vocabulary introduced in each chapter.

**The Research and Writing** includes four sections: (1) Notetaking Wizard (2) Primary Sources (3) Chapter Objectives (4) American Literature

**(1) Notetaking Wizard** - Students use this tool to learn how to take notes and structure writing assignments.

**(2) Primary Sources** allow students to read, view, and hear the ideas and images created by people of past generations.

**(3) Chapter Objectives** provided for each chapter help students to focus on the main ideas.

**(4) American Literature** offers different web sites for students to research topics related to American Literature.

**Current Events** keep current on world events, geography, politics, economics, and social issues. Students are provided with the ClassZone’s weekly Current Events Quiz.
APPENDIX G

G. THE MATHEMATICS ONLINE DIGITAL TEXTBOOK WINDOW


Math (Algebra II) Online Digital Text Window

Find another book

McDougal Littell, Algebra II, 11th Grade

Help with the Math has (1) @HomeTutor (2) PowerPoint Presentations

(1) @HomeTutor provides students help on every topic in each chapter by the interactive electronic tutors to work with the students step by step about how to solve model problems found in each chapter. The Spanish speaking students can press the green
button at the lower corner of the webpage’ requesting a ‘Spanish’ speaking tutor. The following is a page of the web site:

Window for the Interactive Instructor in a Math Lesson (Picture D)
(2) PowerPoint Presentations – There are Power Point presentations based on lesson examples from each chapter. These PowerPoint Presentations are based on lesson examples from the book.

Practice, Practice, Practice contains the eWorkbook. The eWorkbook gives several math problems for each lesson. The advantage is students can enter and check their answers online.

Example of an eWorkbook exercise:

Games and Activities provides (1) Puzzles and Games (2) Math Vocabulary Flipcards

(1) Puzzles and Games offer students fun, interactive games to reinforce understanding of math concepts.
(2) **Math Vocabulary Flipcards** is an interactive approach to review math vocabulary terms in animated format. Each chapter has its set of flipcards of specific vocabulary terms.

**Animated Math** involves engaging problem-solving animations to support lessons’ understanding and more opportunities for exercise practices.

**Quick Reference has five sections:** (1) Formulas and Tables (2) Conversions (3) Parents as Partners (4) Scientific Calculator (5) Electronic Function Library (6) Keystrokes

(1) **Formulas and Tables** – It has in the pdf format Table of Symbols, Table of Formulas, and Table of Properties

(2) **Conversions** - It has Table of Measures

(3) **Parents as Partners** – It has a chart of lesson goals, applications, and exercises to support parents to assist students.

(4) **Scientific Calculator** – It is an online, ready to use scientific calculator.

(5) **Electronic Function Library** – It is an easy-to-use graphing tool to work on math problems and mathematical functions such as graphs and matrices.

(6) **Keystrokes** are mainly for graphing calculator activities using both TI-83 Plus and Casio CFX-9850GC Plus.
APPENDIX H

H. The SCIENCE ONLINE DIGITAL TEXBOOK WINDOW


McDougal Littell, Biology, 10th Grade

Animated Biology allows students to visualize and interact with Biology concepts and processes through simulations and animations.

Interactive Review includes animations, concept maps, vocabulary games, section quizzes, flipcards, and crossword puzzles.

Activities has four sections: (1) Data Analysis (2) Web Quests (3) Activity Maker (4) Audio Downloads
(1) **Data Analysis** allows students to create animated charts and graphs. Students will watch their data come to life.

(2) **Web Quests** help students find answers to scientific questions while exploring the web.

(3) **Activity Maker** helps students create flip cards, use games, and crossword puzzles to understand content concepts.

(4) **Audio Downloads** - Students may download every chapter to their iPod, MP3 player, personal computer to learn the chapter content anytime and anywhere.

**Labs** consist of both Virtual Labs and Virtual Dissections – Students can conduct their own investigations through virtual laboratory, and dissection without the physical mess.

Assessment has the Quizzes and Test Practice – The site offers interactive quizzes for students to improve their test-taking skills before the big examination.

Research Centers contain the Science Links such as National Science Teachers Association (NSTA). This site helps students learn how to ask scientific questions and use evidence to answer them.
### APPENDIX I

#### I. TEACHER QUESTIONNAIRES SURVEY

Scale value: Agree/Neutral/Disagree

<table>
<thead>
<tr>
<th>Domain</th>
<th>Theme Statement</th>
<th>Rating Scale</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Teacher’s Beliefs</strong></td>
<td></td>
<td>Agree</td>
</tr>
<tr>
<td><strong>Theme 1</strong></td>
<td>Teacher’s beliefs on the incorporation of the Literacy Program into the content curriculum using BL methodology</td>
<td>Agree</td>
</tr>
<tr>
<td>1.1</td>
<td>Most students need more support in the areas of reading and concept comprehension</td>
<td>Agree</td>
</tr>
<tr>
<td>1.2</td>
<td>BL approach is supportive in helping students improve different forms of literacy skills through exposure to a variety of online resources</td>
<td>Agree</td>
</tr>
<tr>
<td>1.3</td>
<td>Most students need a well-designed literacy program for improving reading skills for application on reading complex literature</td>
<td>Agree</td>
</tr>
<tr>
<td>1.4</td>
<td>Students face deeper challenges in reading content subject materials</td>
<td>Agree</td>
</tr>
<tr>
<td>1.5</td>
<td>Reading with understanding and fluency are necessary to comprehend content messages accurately</td>
<td>Agree</td>
</tr>
<tr>
<td><strong>Theme 2</strong></td>
<td>Pedagogy and Learning: Advantages of FTF</td>
<td>Agree</td>
</tr>
<tr>
<td>2.1</td>
<td>FTF gives static media presentation, but live instruction and personalized learning experiences</td>
<td>Agree</td>
</tr>
<tr>
<td>2.2</td>
<td>Direct teaching offers immediate differentiated coaching and teaching moments</td>
<td>Agree</td>
</tr>
<tr>
<td>2.3</td>
<td>Use of body language signs for clearer communications</td>
<td>Agree</td>
</tr>
<tr>
<td>2.4</td>
<td>Allows students to build personal relationships with teachers and among themselves</td>
<td>Agree</td>
</tr>
<tr>
<td>2.5</td>
<td>Provides immediate feedback for checking for understanding</td>
<td>Agree</td>
</tr>
<tr>
<td><strong>Theme 3</strong></td>
<td>Pedagogy and Learning: Advantages of OL</td>
<td>Agree</td>
</tr>
<tr>
<td>3.1</td>
<td>Supports learner-center environments, self-pace, independent work, and collaboration among learners</td>
<td>Agree</td>
</tr>
<tr>
<td>3.2</td>
<td>OL students take ownership of all aspects of learning and responsibilities</td>
<td>Agree</td>
</tr>
<tr>
<td></td>
<td>Provides rich varieties of resources for theoretical and practical knowledge</td>
<td>Agree</td>
</tr>
<tr>
<td>---</td>
<td>-----------------------------------------------------------------------------</td>
<td>-------</td>
</tr>
<tr>
<td>3.3</td>
<td>Provides rich varieties of resources for theoretical and practical knowledge</td>
<td>Agree</td>
</tr>
<tr>
<td>3.4</td>
<td>Offers global connections and deeper content information and knowledge</td>
<td>Agree</td>
</tr>
<tr>
<td>3.5</td>
<td>OL allows making up for seat time lost from class absences</td>
<td>Agree</td>
</tr>
<tr>
<td>3.6</td>
<td>Increases outside classroom student-to-student connectivity opportunities</td>
<td>Agree</td>
</tr>
<tr>
<td><strong>Theme 4</strong></td>
<td><strong>Pedagogy and Learning: Advantages of BL or The hybrid mode</strong></td>
<td>Agree</td>
</tr>
<tr>
<td>4.1</td>
<td>Flipping learning between FTF and OL maximizes Bloom’s Taxonomy applications</td>
<td>Agree</td>
</tr>
<tr>
<td>4.2</td>
<td>Digital design of the curriculum allows flexible delivery of instructions</td>
<td>Agree</td>
</tr>
<tr>
<td>4.3</td>
<td>Integrating differentiated instructions using online resources enhance pedagogy to meet different learning objectives</td>
<td>Agree</td>
</tr>
<tr>
<td>4.4</td>
<td>Increases student autonomy: Student may spend more time on particular topics that require additional time to learn and understand during the OL session</td>
<td>Agree</td>
</tr>
<tr>
<td>4.5</td>
<td>Flipping instruction increases both human support and online tools support to increase learning and teacher-student interactions</td>
<td>Agree</td>
</tr>
</tbody>
</table>
## J. STUDENT QUESTIONNAIRES SURVEY

**Scale value: Agree/Neutral/Disagree**

<table>
<thead>
<tr>
<th>Domain</th>
<th>Theme Statement</th>
<th>Rating Scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>Domain 1</td>
<td>Learning Environment Preference</td>
<td>Agree Neutral Disagree</td>
</tr>
<tr>
<td>1.1</td>
<td>FTF only is my reference</td>
<td>Agree Neutral Disagree</td>
</tr>
<tr>
<td>1.2</td>
<td>OL only is my preference</td>
<td>Agree Neutral Disagree</td>
</tr>
<tr>
<td>1.3</td>
<td>BL is my preference</td>
<td>Agree Neutral Disagree</td>
</tr>
<tr>
<td>Domain 2</td>
<td>Advantages of Traditional FTF Learning</td>
<td>Agree Neutral Disagree</td>
</tr>
<tr>
<td>2.1</td>
<td>Live instruction and personalized learning experiences</td>
<td>Agree Neutral Disagree</td>
</tr>
<tr>
<td>2.2</td>
<td>FTF instruction offers immediate differentiated coaching and feedback</td>
<td>Agree Neutral Disagree</td>
</tr>
<tr>
<td>2.3</td>
<td>Allows verbal and nonverbal communication</td>
<td>Agree Neutral Disagree</td>
</tr>
<tr>
<td>2.4</td>
<td>Facilitates the development of personal relationship with both teachers and among peers</td>
<td>Agree Neutral Disagree</td>
</tr>
<tr>
<td>2.5</td>
<td>Teacher modeling applications are important for deeper learning</td>
<td>Agree Neutral Disagree</td>
</tr>
<tr>
<td>2.6</td>
<td>Teacher is role model for student developing study habits, appropriate group interactions and disciplined behaviors</td>
<td>Agree Neutral Disagree</td>
</tr>
<tr>
<td>Domain 3</td>
<td>Advantages of online</td>
<td>Agree Neutral Disagree</td>
</tr>
<tr>
<td>3.1</td>
<td>Supports learner-center environments, independent work, and collaboration among learners</td>
<td>Agree Neutral Disagree</td>
</tr>
<tr>
<td>3.2</td>
<td>Student takes ownership of all aspects of learning and responsibilities</td>
<td>Agree Neutral Disagree</td>
</tr>
<tr>
<td>3.3</td>
<td>Provides rich varieties of resources for theoretical and practical knowledge</td>
<td>Agree Neutral Disagree</td>
</tr>
<tr>
<td>3.4</td>
<td>Offers richer content knowledge and reference resources</td>
<td>Agree Neutral Disagree</td>
</tr>
<tr>
<td>3.5</td>
<td>Increases seat time by providing learning opportunities on-site and off-site</td>
<td>Agree Neutral Disagree</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Increases virtual student-to-student connectivity opportunities</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>-------------------------------------------------------------</td>
</tr>
<tr>
<td>Domain 4</td>
<td>Advantages Blended Learning</td>
<td>Agree</td>
</tr>
<tr>
<td>4.1</td>
<td>Offers both human support and online tools support</td>
<td>Agree</td>
</tr>
<tr>
<td>4.2</td>
<td>Combines online digital textbook-based instruction with classroom-based instruction</td>
<td>Agree</td>
</tr>
<tr>
<td>4.3</td>
<td>Hybrid learning increases learning opportunities to cover required learning objectives</td>
<td>Agree</td>
</tr>
<tr>
<td>4.4</td>
<td>Integrating online resources via flipping instructions enrich in-class instruction</td>
<td>Agree</td>
</tr>
<tr>
<td>4.5</td>
<td>Enhances teacher to student connectivity between face-to-face and online communication</td>
<td>Agree</td>
</tr>
<tr>
<td>4.6</td>
<td>Digital curriculum is convenient, paperless, inexpensive, and supports classroom instruction</td>
<td>Agree</td>
</tr>
<tr>
<td>Domain 5</td>
<td>Blended Learning instruction support students’ literacy achievements in content subject reading and comprehension</td>
<td>Agree</td>
</tr>
<tr>
<td>5.1</td>
<td>Most students need more support in reading and concept comprehension</td>
<td>Agree</td>
</tr>
<tr>
<td>5.2</td>
<td>Most students need the support of a well-designed literacy program for improving reading skills for application on reading complex literature</td>
<td>Agree</td>
</tr>
<tr>
<td>5.3</td>
<td>Students face deeper and more challenges in reading content subject materials</td>
<td>Agree</td>
</tr>
</tbody>
</table>
# APPENDIX K

## K. PARENTS’ QUESTIONNAIRES SURVEY

**Scale value: Agree/Neutral/Disagree**

<table>
<thead>
<tr>
<th>Survey</th>
<th>Theme Statement</th>
<th>Rating Scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1</td>
<td>Parents are interested in their children’s education and academic success</td>
<td>Agree</td>
</tr>
<tr>
<td>1.2</td>
<td>Parents believe that they should be involved and work with the school in their children’s education</td>
<td>Agree</td>
</tr>
<tr>
<td>1.3</td>
<td>Parents believe that their children’s education at home is important</td>
<td>Agree</td>
</tr>
<tr>
<td>1.4</td>
<td>Parents believe that their involvement at school is equally important</td>
<td>Agree</td>
</tr>
<tr>
<td>1.5</td>
<td>Parents believe that frequent communication with subject teachers is necessary to be well-informed of their children’s academic progress</td>
<td>Agree</td>
</tr>
<tr>
<td>1.6</td>
<td>Parents and teachers are both important role models for children</td>
<td>Agree</td>
</tr>
<tr>
<td>1.7</td>
<td>Parents can work with teachers to create good reading lists and reading activities at home</td>
<td>Agree</td>
</tr>
<tr>
<td>2.1</td>
<td>Parents are concerned about their children’s reading proficiency development and progress in all subjects</td>
<td>Agree</td>
</tr>
<tr>
<td>2.2</td>
<td>Parents are in agreement that the BL environment creates new opportunities to acquire more knowledge</td>
<td>Agree</td>
</tr>
<tr>
<td>2.3</td>
<td>Parents approve of their children acquiring knowledge of new technologies in preparation for college studies and future career</td>
<td>Agree</td>
</tr>
</tbody>
</table>
APPENDIX L

L. OBSERVATION REPORTS OF ENGLISH, SOCIAL STUDIES, MATH, AND SCIENCE CLASSES

A. Observation Reports (10th and 12th Grade English Class)

<table>
<thead>
<tr>
<th>Observation Report</th>
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</thead>
<tbody>
<tr>
<td><strong>Teacher:</strong> E1, Grade Level 10th</td>
</tr>
<tr>
<td><strong>Subject:</strong> English</td>
</tr>
<tr>
<td><strong>Observed By:</strong> Department Supervisor (Researcher)</td>
</tr>
</tbody>
</table>

**Aim:** Read passages from previous English Regents:

**Part I:** What lessons from childhood does the protagonist in “Unforgettable Miss Bessie” reveal?

**Part II:** How do we interpret the critical lens statement on regents Part II, B?

**Pre-Class Assignments:**
The teacher asked students to perform pre-class assignment by reading this passage from the Internet address: [www.nysedregents.org/ComprehensiveEnglish/Archive/20030619exam2.pdf](http://www.nysedregents.org/ComprehensiveEnglish/Archive/20030619exam2.pdf) on page 8.

The teacher asked students to prepare the following: “Write a critical essay in which you discuss two works of literature you have read from the particular perspective of the statement that is provided for you in the Critical Lens. In your essay, provide a valid interpretation of the statement, agree or disagree with the statement as you have interpreted it, and support your opinion using specific references to appropriate literary elements from the reading.”

A. In your opinion, do you think Miss Bessie was a good teacher? Explain your answer and support it with evidence from the selection.

B. Why did Miss Bessie believe that education is the first step in accomplishing dreams?

**In-Class Warm Up:** Students were asked to work on the following task from Comprehensive Examination in English Part A, passage 2.

**In-Class Instruction:** After you have read the passages and answered the multiple-choice questions, write a unified essay about lessons from childhood as revealed in the passages. In your essay, use ideas from both passages to establish a controlling idea about lessons from childhood. Using evidence from each passage, develop your controlling idea and show how the author uses specific literary elements or techniques to convey that idea.

The following is the post-observation report the researcher wrote to the teacher:

Dear ________

I had the pleasure of observing your class on the above date. When I came into your room, you had already started an activity with your students with the question: “Why do students love Miss Bessie so much?” Your inquiry allowed your students to call to their minds
the book they were supposed to have read for homework. They responded to this question and several others with various answers, indicating that most of them had read the passage online the day before. You divided your students into groups of five. You provided each group a piece of paper on which members of the group could write down ideas from the passage that helped to establish a controlling idea about the “lessons from childhood.”

The second part of your lesson was helping students to understand the concept of “controlling idea” from a passage from the English Regents. You asked three students to read different lines of the passage. What is the first thing to do in reading the passage? A student called out: “Finding the controlling idea.” What do you do after you? You emphasized that reading the passage carefully is important in order to understand the main theme of the reading. You suggested that they should use the online dictionary via their I-Pad throughout the class session to look up every word that they don’t know.

You proceeded to the 2nd phase of the lesson by asking students to do a class activity. The first part of the activity consisted of reading the critical lens from the web site, page 7, part B of the Regents:

Critical Lens:

“Good people...are good because they've come to wisdom through failure.”
_William Saroyan as quoted in “Room for Hate – and Hope” from New York Journal-American, August 23, 1961

You explained the definition of the quotation and paraphrasing as you guided your students to write a critical essay according to the following instruction:

1. Read/understand the critical lens
2. Interpret
3. Agree/disagree
4. Say why
5. Support your opinion using two works of literature

The instructor continued the lesson with a handout of another article in order to reinforce what you had just taught: “God sees the truth but waits? By Leo Tolstoy published in 1872. You began to describe the article relating it to concepts you have taught from the lesson. Your focus point was dealing with how the protagonist of this story deals with injustice and fate. You ended the class with a review of next day’s class theme. You described the article relating it to concepts you have taught from the lesson. You planned to continue this lesson in your next class. You gave students an assignment with a set of questions to think about and to discuss in the discussion board.

**Strengths of the lesson:**

1. The instructor has a good command of the materials intended for the class instruction.
2. Aim is clearly stated. Instructional objectives are evident and effective.
3. Lesson is appropriate for a Regents’ class.
4. The instructor used questioning and discussion techniques effectively to develop
concepts and ideas related to this lesson.

5. The instructor made key ideas stand out and connected new concepts with the ideas. For example, you explained the difference between literature and fiction and helped students to use that information to analyze the text chosen for this lesson.

**Comments regarding student engagement:**
The instructor started a brainstorming activity with your students with the question “Why do students love Miss Bessie so much?” The class activities allowed the students to call to their minds the book they were supposed to have read for homework. They responded to this question and several other similar questions indicating that most students had done the reading assignment.

The teacher definitely moved around the room to reach out to everyone. Having a group setting allowed students more personal interactions. Each group was actively engaged in a sort of conversation or debate. The instructor spoke with each student and made a few comments or suggestions, and tried to help them organize their ideas in a logical and coherent manner. As the instructor walked from group to group, he showed them how the author sometimes used specific literary elements (for example: theme, characterization, structure, point of view) or used techniques such as symbolism, irony, and figurative language with the aim of effectively conveying the controlling idea.

**Comments regarding questioning techniques:**
One of the instructional objectivities in this lesson was to help students use ideas from the passage to establish a controlling idea about lessons from childhood. After students had finished brainstorming with the teacher about “Lessons from childhood” and had written down the idea from the passage in the group session.” He moved the class to the laboratory and had students doing research online to complete the assignments.

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**12th Grade English Class Observation Report**

**Teacher:** E3, Grade Level 12th **Subject:** English **Observed By:** Department Supervisor (Researcher)

The instructor had the aim neatly written on the Smart Board. Six words were written on the left side in vertical order. 18 words were on the right side.

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<tr>
<th>Left Side</th>
<th>Right Side</th>
<th>Right Side</th>
<th>Right Side</th>
</tr>
</thead>
<tbody>
<tr>
<td>Troy</td>
<td>Theme(s)</td>
<td>Comparison</td>
<td>Change/shift/transition</td>
</tr>
<tr>
<td>Gabriel</td>
<td>Structure</td>
<td>Simile(s)</td>
<td>Allusion(s)</td>
</tr>
<tr>
<td>Rose</td>
<td>Voice(s)</td>
<td>Metaphor(s)</td>
<td>Meter(s)</td>
</tr>
<tr>
<td>Lyons</td>
<td>Images</td>
<td>Personification</td>
<td>Rhyme</td>
</tr>
<tr>
<td>Cory</td>
<td>Tone/mood</td>
<td>Symbols</td>
<td>Repetition</td>
</tr>
<tr>
<td>Bono</td>
<td>Alliteration</td>
<td>Assonance</td>
<td>Hyperbole</td>
</tr>
</tbody>
</table>

The teacher made references to these words as she integrated them into her lesson throughout the class time. As soon as students were settled, the teacher began by directing their attention to the aim of the day: “Let me give you a little background of Sonnet. It’s the folk song of the middle age. An Italian named Petrarch wrote the first sonnet.” The teacher
continued after some interactions with the class: “Guess what language you think the sonnets were?” As a way of keeping the class interested, the teacher sprinkled the day’s lesson with anecdotes. After an introduction of the theme of the day, the class seemed to be ready for the main dish. The teacher drew on the Smart Board and explained: A sonnet is a fourteen-line poem (love poem), usually in iambic pentameter, with a varied rhyme scheme. “How many types of sonnets do you think there are?” The teacher looked around for a response, and explained: “The two main types of sonnet are the Petrarchan (or Italian) and the Shakespearean. The Petrarchan Sonnet is divided into two main sections, the octave (first eight lines) and the sestet (last six lines).” You drew fourteen lines on the Smart Board and placed the alphabets in front of each line, ababba. It could also rhyme abaccc or even (rarely) abababab, and a sestet, which may rhyme xyxxy or xyyxy. You continued by saying: “The English or Shakespearean sonnet, developed by Henry Howard, around 1541-1547, consists of three quatrains and couplet – that is, it rhymes abab cdcd efef gg. Why do you think it took 200 years before the sonnet arrived to England? Messages traveled slowly those days. It took the Renaissance for the Sonnet to reach England.”

The second phase of the lesson consisted of a cooperative group activity. Students were seated in groups of 4 or 5. The teacher reminded them to select among themselves a recorder, timer, and a presenter. Each group had a handout with a question sheet. “Spend 10 minutes to reflect, one person reads it aloud, and discuss it among you,” the teacher suggested. While students were working in groups, the teacher acted as a coach walking around and stopped at each group, checking to see if anyone needed help: “Very good, you got the right ideas”, “Let me help you with this one: Does heaven have eyes? No, human beings do, it is the personification of heaven.” With another group, the teacher explained: “The English sonnets frequently have to do with immortality whereas the Italian sonnets deal more with love.”

Five minutes before the end of the period, the teacher conducted a summary of the lesson with the class by asking questions from the lesson. There was clear evidence of learning in the students’ responses. They understood well what a sonnet is, and the differences between two types of sonnets. As one student replied, the English sonnet, even though it grew out of the Italian sonnet, is unlike the Italian sonnet because it has 4 divisions: 3 quatrains and a rhymed couplet.

The students received two lab assignments for the next day:
1st assignment: “Write an essay in which you discuss, explain, and interpret the meaning of Shakespeare’s sonnet #18. The teacher emphasized that “be sure you have addressed most of the above questions in your composition. Please post your work online in the discussion board, and introduce your discussion thread for the class.”

2nd assignment: The teacher gave a ‘show and tell’ demo of how to do the 2nd assignment; she then clicked the You Tube link in the Smart Board and let the class listen to it for two minutes. www.noadradiocom/music/james+Taylor?l=0. The teacher explained the lyrics of “The Secret of Life” as the class listened to the words of the song and followed the text. She explained to the class that these questions will be on the Course Site: Students were to work on these questions before coming to class, and be ready to discuss the content in class.

1. What does the singer say is the secret of life?
2. Who is capable of knowing his secret?
3. “Nobody knows how we got to the top of the hill.” What does this mean?
4. “We might as well enjoy the ride?” To what is ride compared?
5. What does the singer say is the secret of love?
6. What does the singer say about fear?
7. Everybody knows that love is the only road. How can love be like a road?
8. “Since we’re here for a while,” What advice does the singer give?
9. What does the singer say about time?
10. “Sliding down and gliding down.” To what two things does the singer compare living?
11. What is the main idea?

For extra credit: The teacher gave the following instruction for the online assignment: “How does the main idea of the lyric as an attitude compare/contrast with two of these four quotes from Anne Frank’s Diary? Say whether each quotation would be either similar or dissimilar with the attitude of the singer. If you say this quotation is similar to the lyric then explain why, or decide the quote is dissimilar, and then explain.” Students were to return the work online and create a discussion thread on the following phrases topic.
“I was so lonely and now I’ve found the solution.” (p. 196)
“The end of the war is so terribly far away, so unreal, like a fairy tale.” (p. 176)
“I regard our hiding as a dangerous adventure, romantic and interesting at the same time.” (201)
“Why do some people have to starve...why are people so crazy?” (201)

Strengths of the Lesson:
1. There is a clear indication that effective preparation and organization have gone into the development of the objectives and the goal of the lesson.
2. Teacher is very knowledgeable of the subject matter. The excitement and love for the subject is transferred easily to the students. Consequently, students were enthusiastic and took an active part in the lesson, as well as assuming a majority of the responsibility for the success of the discussion.
3. Objectives were clearly stated and the lesson met all objectives. The lesson plan had a clear progression throughout.
4. The lesson was summarized with specific occurrences referenced, and was followed up from the previous lesson and then connected to the next lesson. The Lab assignment was very specific and clearly supported with a demo.

Commendations and Recommendations:
1. In our post conference, the teacher was suggested to create more appreciation time during the lesson. It worked very well by having the instructor facilitated the group discussion with a pivotal question for each line before going on to the next line.
2. The class questions were of uniformly high quality. There was a discussion concerning building student motivation by having students create their own sonnets, with multimedia presentation. It was agreed that projects that have depth, duration, and complexity would challenge students and motivate them towards construction of knowledge.
Dear __________

Thank you for inviting me to your Global Studies 10th grade class on Monday September 16. When I entered the room, you were discussing and brainstorming with students the meaning of the word of the word “theme” in the study of Global Studies events. The ‘Aim’ and ‘Warm Up’ were posted.

**Aim:** How can we better understand the themes of global history?

**Warm Up:** In English class, what is a theme? What does the word theme mean in a Global Studies class?

You turned on the YouTube to demonstrate two examples to model how to identify the theme from two articles written in The New York Times, the Education section. The ‘Warm Up’ was an effective and motivational introduction for the purpose of this lesson.

You began the Mini Lesson by handing out a sheet, which consists of a list of different themes in the Global History curriculum, that students were expected to know how to discuss the following ideas based on the previous day’s online assignment:

a. Describe what led to the events happening (historical circumstances)

b. Describe the event itself

c. Describe the positive and negative effects of the events

Throughout the mini lesson, you used the digital text, online visual and Concept Map to guide the class discussion. You reviewed topics on:

A. Change: Neolithic Revolution, Industrial Revolution, Chinese Communist Revolution

B. Turning Points: Fall of Constantinople, Voyage of Columbia, French Revolution, Collapse of Communism in the Soviet Union
C. Belief Systems: Hinduism, Buddhism, Jewish, Christianity, Islam

In your instruction and discussion with the class, you gave plenty of examples of each of the above themes. For example, how Ancient Egypt provides an early example of how society’s worldview drives engineering and the development of Science. The students had a clear idea of how religion was the foundation of a country’s history and tradition, civics and government, economics, engineering, and science. You had a specific aim for this class and clear and high expectations of what students should learn by the end of the lesson.

During the developmental part of the lesson, you incorporated challenging questions that build towards higher order thinking skills. During “Guided Practice” you used ‘concept map’, question prompts, reading and analyzing text to help each student to practice using a concept map on one of the Global History themes to see the connections among the ideas A, B, and C listed above. This task was to serve as a model for their future work. Classroom conversations indicated a strong sense of students’ learning and understanding of the day’s lesson as you called on volunteers and non-volunteers from each group to make reference to text, to critique, and discussion the pivot questions you prosed to them.

The class continued with a session of “Independent Practice and Share Out”. Students were asked to analyze two other themes on their own, completing the concept map of each piece in their I-Pad. Students had to describe what led to the event (historical circumstances), characterize the event itself, and discuss positive and negative effects of each of the two themes. During the “Share Out”, a couple of students verbally presented their work. One student went to the Smart Board to display his concept map written from the I-Pad. The ‘Exit Question’ was: What can you tell me about each of your two themes?

In conclusion, you told the class that the next lesson will consist of using the concept map as a guide for writing two thematic essays. Students can look at a list of themes you posted in the course unit.

The class was charged with enthusiasm, reflexive response, and a lot of positive energy to your instruction.

Commendation:

1. You strategically tied in new materials with learned materials of the previous day’s
work and assignment. You developed every idea by way of definitions and concepts. In recalling prior work that students did before, you relied on their recollection by giving them hints, rather than merely stating it directly.

2. Both your class work and home assignment showed evidence of spiraling. This is useful for this class because they will be taking the Global Studies Regents next year.

3. Throughout the class, you used various instructional strategies effectively both in class and online. It was a vigorous lesson. I was surprised to see how you managed to cover so much in one period and yet students demonstrated understanding reflected in their responses.

**Recommendations:**

As I had commented in my previous observation report, you continued speaking very fast and without breaks while moving from one idea to another. Most students learn and retain more and better of the lesson content, especially ELLs, and Special Needs students, if you speak slower and with breaks in between ideas so that students have enough time to think, reflect, and to draw conclusions of the class discussion.

The lesson was motivating, interesting, well organized and developed. You set high expectations and the students were cooperative. You elicited important information and ideas from the students by the way you questioned them. Also, you proceeded from simple ideas to more complex ones. You managed to help students see the connections of ideas globally and as personal experiences in their lives. There was evidence that you incorporated writing in this lesson, as the Warm Up required thinking and writing, and making connections of concepts across content subjects.

Sincerely,

M. Hui

School Director
C. Observation Report (11th grade American History class)

**OBSERVATION REPORT: 11TH GRADE AMERICAN HISTORY**

**TEACHER:** H2  
**SUBJECT:** SOCIAL STUDIES – AMERICAN HISTORY  
**GRADE LEVEL:** 11TH  
**DATE OF OBSERVATION:** DECEMBER 18  
**OBSERVED BY:** SCHOOL DIRECTOR HUI

Dear _____

You invited me to observe your class on Friday, December 18, 2013. You began the class by giving students a 10-minute quiz on the assignment they did the previous day. The students were told to list three Presidents, their years in office and their Vice Presidents. The quiz required the students to write a short paragraph describing one important agenda accomplished with respect to the years they were in office. After the quiz, you began the lesson of the day.

**Aim:** What were the early effects of the Industrial Revolution?

The students were asked to prepare this class with the following webpage assignment to be familiar with the eight effects of the Industrial Revolution listed in the webpage:


The webpage introduces the eight effects of the Industrial Revolution:

- Working Conditions
- Living Conditions
- Urbanization
- Public Health and Life Expectancy
- Child Labor
- Working Class Families and the Role of Women
- The Emerging Middle Class
- Wealth and Income

[https://www.youtube.com/watch?v=JhF_zVrZ3RQ](https://www.youtube.com/watch?v=JhF_zVrZ3RQ)

You flipped to YouTube for comparing the American Industrial Revolution to the **Industrial** Revolution in England. You prepared the video published on Jan 24, 2013. "Why did the Industrial Revolution happen in 18th century Britain?"
It happened because of the special combination of geological good fortune, the ascendancy of political liberalism, enlightened thinking, and imperial power meant change was more likely to begin in Britain than elsewhere. The Industrial Revolution happened because the economic conditions were right to ensure its sustained success. And finally, there was also one important change that still is with us today, the conviction that the future will never be the same as the past.”

You used the following music to accompany the video: "Feuerfest Polka, Op. 269" by Royal Philharmonic Orchestra & Peter Guth (iTunes • AmazonMP3 • eMusic); Category: Education License: Standard YouTube License

This lesson helped the students to unpack the reading assignments they had for homework. The teacher continued the class with maps, pictures, and share out information. The students took notes in their I-Pad and used the handout you provided with the leading questions to focus on the discussion. Occasionally, you stopped to explain and clarify questions students had. You walked around the students checking for understanding as you presented and used vocabulary words and quotes to punctuate important points of the lesson. At the end, you asked students to complete the question sheet for homework. You also provided them a list of online readings for the weekend.

**Commendable Features:**

1. You provided effective visual aids and guided questions throughout the lesson.

2. The students were assigned chapters and links posted in the Course Site prior to the class presentation.

3. You established the routine and procedures facilitating learning and students’ familiarity with the organization of learning materials.

4. You checked for understanding and provided students with information aligned with the NYS learning standards on Social Studies subjects.

**Recommendations:**

1. You may want to develop more on questioning skills using Bloom’s Taxonomy; differentiate
3. You can try to allow students to use class time to share what they had comprehended; model various types of note taking techniques; and use interactive journals.

3. Another suggestion to consider is to assign an idea or specific chapters to a group of students on a rotational basis then have these students talk about the assigned reading after you have presented the key idea to the entire class. This practice gives students opportunities to be experts and share ideas with the class and make connections that you may not have touched upon.

You strategically tied in new materials with learned material from the previous day’s assignment and homework. You developed every idea by way of definitions and concepts. In recalling prior work that students did before, you relied on their recollection by giving them hints, rather than merely stating it directly. Both your class work and homework showed evidence of spiraling. This is a useful strategy for recalling information and facts in a Social Studies class. It was my pleasure to observe your class.

Sincerely,

M. Hui,

School Director

D. Observation Report (12th grade Economics class)

**OBSERVATION REPORT: 12TH GRADE ECONOMICS**

**TEACHER: H3**

**SUBJECT: SOCIAL STUDIES – ECONOMIS**

**GRADE LEVEL: 12TH**

**DATE OF OBSERVATION: FEBRUARY 13, 2014**

**OBSERVED BY: SCHOOL DIRECTOR HUI**

Dear ________

Thank you for the opportunity of visiting your classroom on Thursday February 13, 2014. The following is the lesson presentation on the topic of Globalization in your Economics
Aim: What is Globalization?

Warm Up: Students worked on the Globalization Chart using the handout you distributed in class.

Pre-observation: In our pre-observation, you discussed how you would develop the theme of Globalization so that students will leave the classroom with a few basic seed ideas of Globalization.

Observation: When I entered the class, you had this chart written on the handout sheet. You asked students to fill up the following chart giving their conception of globalization in each of the five categories as you proceeded with a brainstorming session with your students about globalization. In the process, you helped students to define the meaning of Globalization, and to understand the influences of globalization in the field of politics, economic, social, cultural, and religious life. Students exhibited deep interest in the discussion and were engaged actively and interactively as you led the discussion. You posted the same chart online for students to review the class notes at home.

<table>
<thead>
<tr>
<th>#</th>
<th>Political</th>
<th>Economic</th>
<th>Social</th>
<th>Cultural</th>
<th>Religion</th>
<th>Technology</th>
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1. https://www.youtube.com/watch?v=wGULEb3rYeg
   Uploaded on May 16, 2008
   Animation created for the Communication Students about Globalization. Done with Flash 8 Professional. Category-Film & Animation. Standard-YouTube License

2. https://www.youtube.com/watch?v=3oTLyPPrZE4
   Uploaded on Oct 24, 2011
   “The world is becoming more and more interconnected. Globalization changes how people consume work and live almost everywhere on the world. Today, many economic, political, cultural or ecological relationships are not explainable from a national perspective. At
the same time, a controversial debate about the consequences of globalization has begun. But what are the main causes for globalization? In what areas it is most prominent? And who are the winners and losers of globalization?”
These are the questions this animated Video clip of the WissensWerte series/
http://www.edeos.org/en
http://www.facebook.com/edeos.orgCategory Education: License Standard YouTube License
3.https://www.youtube.com/watch?v=LtmvksvSvtc
Globalization: What Does It Really Mean?
You explained: “Globalization affects everyone in many ways. It affects the food we eat, the cars we drive, and the devices we use. Even though we are aware of globalization, what is it really? Other than knowing that globalization is in effect, how does it affect you?
This is the point of our documentary. We went around Auburn University's campus asking different people of different age groups, races, and financial backgrounds about globalization. Our purpose was to see everyone's interpretation of globalization. We wanted to see the thread, if any, of similarity in everyone's answers.”
Uploaded on May 17, 2008
Short film on issues of globalization, climate change, the environment, and what big business can do to help, directed by Sharron Ward. Please excuse low res audio & video. Filmed 2001, BBC Learning Zone.
5.https://www.youtube.com/watch?v=ka1NkGwBDLY
Published on Aug 30, 2012
Is Globalization a friend of human civilization? Or would it just plant roots for socio-cultural degeneration and other problems in the future? This paper-cut themed motion picture will showcase both the advantages and disadvantages of this so-called "Globalization", allowing you to decide for yourself, whether Globalization is a FRIEND or a FOE. You presented another YouTube on the globalization of health care.
https://www.youtube.com/watch?v=ka1NkGwBDLY
You presented these You-Tubes and created discussions from the above passages on themes
related to the meaning, advantages and disadvantages, and different perceptions of
Globalization expressed by different people from around the world. You did not complete all
the YouTube videos, as there were many. You asked students to continue the video viewing at
home or in the lab.

After the YouTube presentations, you asked your students to compare and comment on what
they had written about globalization to what they just heard from the videos. Students were to
write an essay on the topics listed in the handout chart as an assignment to be presented in the
next class.

**Strengths of your lesson:**

You have clear goals for what students should be able to achieve and know by the end of the
lesson. The “Warm Up” scenario was a useful way to get students engaged immediately in the
day’s lesson. This is also supported by the differentiated approaches we talked about in our
Pre-Observation conference. For example, during the discussions, you asked a range of
questions and proposed challenges that helped your students to start thinking about their own
contribution to the concept of globalization. Each student responded to the question he or she
felt comfortable answering. You provided explanations for each question and probed pivotal
points to lead your students to the correct responses. You had work prepared for each student
and you presented it in a clear manner. However, not all students came to class prepared to
learn and to work. Two students came in late. One came in and stood looking out of the
window for a while. You went immediately to that student and politely called his attention to
the classwork that the other students were engaging in. At the end of the class, you
summarized the lesson and gave each one the opportunity to answer questions related to the
key areas that you wanted to cover. You also gave them a short article to read. Every student
had a chance to assess his/her understanding of the passage as he or she read aloud.

You lesson had a clear focus. The aim was simple but allowed higher-level thinking and
discussion. It is a good practice that you encouraged students to think both silently and aloud.
You have excellent rapport with the students and you exhibited a relaxed and friendly manner. I learned a lot from your presentations.

Sincerely,

M. Hui,
School Director

E. Observation Report (10th grade Geometry class)

| OBSERVATION REPORT: 10TH GRADE GEOMETRY ONLINE CLASS |
| TEACHER: M1                                      |
| SUBJECT: MATHEMATICS – GEOMETRY                  |
| GRADE LEVEL: 10TH                                |
| DATE OF OBSERVATION: FEBRUARY 14, 2014           |
| OBSERVED BY: SCHOOL DIRECTOR HUI                 |

Dear ____________

Thank you for inviting me to your Geometry Lab class. When I entered, you had this webpage on the Smart Board. You conducted this lab class using the free online lesson template provided by math.com. The students entered into this site and began working on their own. You walked around to watch the students. Whenever necessary, you provided help and support. Some students were self-assessing, working on the unit quizzes. You took advantage of the teaching moment and demonstrated for them test-taking strategies and clearly had in mind the very worthwhile goal of getting your students prepared for the mid-term and final-term exams.

Aim: What are the properties of Polygons?


Polygons are many-sided figures, with sides that are line segments. Polygons are named according to the number of sides and angles they have. The most familiar polygons are the triangle, the rectangle, and the square. A regular polygon is one that has equal sides. Polygons also have diagonals, which are segments that join two vertices and are not sides.
### Polygon basics

- Triangles
- Quadrilaterals
- Area of polygons and circles

<table>
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<th>Polygons</th>
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<th>no. of vertices</th>
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The table lists all the polygons having up to 10 sides.
Click the name of each polygon in the table to see a diagram.
| triangle    |
| quadrilateral |
| pentagon |
| hexagon |
| heptagon |
| octagon |
| nonagon |
| decagon |

**Teacher-Developed Blended Learning Model**

Macy Hui
Some students went to the glossary link to review the math vocabularies. The following link opens up to a list of mathematics glossary.

http://www.math.com/school/glossary/glossindex.html

For example, a student clicks on A and encounters math terms or vocabularies under the letter A, etc.

**A**

absolute value
acute angle
acute triangle
additive identity
additive inverse
adjacent angles
angle
arc
area
associative property of addition
associative property of multiplication
average
axis of symmetry

**B**

base
bisect
box and whisker plot

Some students were working on the unit quizzes. Students could choose a quiz at the level of difficulties according to their understanding of each topic. For examples: Polygon Quiz - http://www.math.com/school/zsubject3/S3U2Quiz.html
Quiz on Congruent Figures  http://www.math.com/school/subject3/lessons/S3U3L1GL.html

Quiz on Similar Figures  http://www.math.com/school/subject3/lessons/S3U3L2DP.html

Quiz on Squares and Square Roots

Quiz on Space Figures

Quiz on Prisms

Quiz on Pyramids

Cylinders, cones and spheres

Three-Dimension Figures Unit Quiz
http://www.math.com/school/subject3/S3U4Quiz.html
Some students were on the section of Homework Help
http://www.math.com/students/homeworkhelp.html#geometry

Commendations:
1. Routines were well established in the Online Lab and every student was on-task.
2. You also provided students with the same important understandings of math skills as you were in your face-to-face class, but proceeded with different levels of support, challenge, and assessments.
3. Your lesson outline provided a critical review of every topic in the lesson.
   Students were guided by independent practice at different levels of their learning based on their own choice.
4. You posted a set of tiered activities and quizzes links for each topic so that students can choose to practice from easy to more complex problems.

   This was a very revealing experience on how students learn the Geometry lesson practically on their own. The lesson was excellent.

Sincerely,

M. Hui
School Director
F. Observation Report (10th grade Biology class)

<table>
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<td>OBSERVED BY: SCHOOL DIRECTOR HUI</td>
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Dear __________

Thank you for opening your classroom to observe your Biology class this morning. When I entered the room, you were in the process of explaining the aim of the day’s lesson.

**Aim:** What are the biological implications of the process of diffusion for living organism?

**Objectives:** Be able to explain the biological implications of having a selectively permeable membrane in regards to diffusion.

You continued by saying: “This lesson is a precursor to our future discussion about the structure and function of the cell membrane in detail. You must understand the basic concept of diffusion before they are able to understand how the cell membrane set up concentration gradients to allow certain ions to pass through.”

**Warm Up:** Students were asked to explain in their own words the meaning of a quote taken from the text, “The cell membrane is selectively permeable.”

You spent about 10 minutes reviewing the following YouTube you assigned the class to preview before coming to the class.

https://www.youtube.com/watch?v=QpcACa39YtA

Cell Membrane Introduction from Khan Academy published on Sept 17, 2013.

“Learn about how phospholipids form the cell membrane and what types of molecules can passively diffuse thorough the membrane. By William Tsai”

After ten minutes, you choose a few students to share out their answers.

Your mini lesson consisted of about 10 minutes focusing on reviewing the purpose of the cell membrane. “How does the cell separate the inside from the outside environment? The cell accomplishes this task because its structure makes it selectively permeable. By this, we mean that it allows certain materials to easily pass back and forth across the cell membrane without the use of energy whereas other materials need the help of proteins or the use of ATP
(energy) to cross the membrane. The experiment we will be conducting today will help you understand the concept of selective permeability. Also, at the end of the experiment you will be asked to critically think about the process of diffusion as essential to all living organisms.

You used the differentiation of content/process for some students who are at a lower reading level: A group of students was given a flow chart with the procedures. You went to this group and explained to them slowly how to perform this task.

The next step of your class lecture was to demonstrate for them how Iodine turns blue in reaction to starch. When a starch solution was placed in dialysis tubing (a semi-permeable membrane) and the tubing was added to a beaker of iodine, you asked the class: Will the starch be able to pass through the tubing and turn the water blue or will the smaller iodine molecules pass through and turn the contents of the tube blue? Instead of actually doing the experiment, you demonstrated the lab activity via the YouTube:

https://www.youtube.com/watch?v=ApuH1ZheQuE

The question: Iodine, a starch indicator, is added to a mixture of glucose solution and starch solution. Is there a color change inside the cell? Is there a color change outside the cell? After 5 minutes, the cell has completely changed color. Explain why?

In the next 10 minutes, you reviewed the process of diffusion with each group using an online video for the students to see the direction in which the molecules moved. The chart paper at each table also had room for students to put their predictions about the lab experiment, a section where they must draw the initial and final state diagrams of their model cells, and a section for their conclusions and findings at the end of the experiment. You explained to the recorder of the group that he is responsible for having this sheet filled out by the end of the lab class and that will be used in tomorrow’s lesson to complete the analysis questions. Students witnessed a model lesson on cell diffusion while observing the video, and at the same time guided by your explanation. Each student was responsible for a specific role in the group. (Leader, Recorder, Experimenter, and Materials Manager). You explained and reminded students of the responsibility of each role. At the end of the lesson, the team manager must ensure all materials are cleaned and prepared and available for the next class.

Commendations:
1. You had clear goals in each part of the lesson for what students should be able to know or do in terms of a larger unit – The Cell Membrane and Functions.

2. You provided visual, verbal, and written directions and expectations for each of the tasks you outlined on the interactive Whiteboard.

3. Students exhibited good work ethics in your classroom. From the amount of interactions between you and your students and among the students themselves, it appeared that they had done the reading assignment, and showed a strong desire to complete the work in class.

4. You were aware that some students were at a lower level of English proficiency, therefore, you explained the lesson content slowly and clearly so that every student had a chance to learn and retain the lesson content. You chose a video where the speaker spoke slowly and clearly; the speaker paused after each line to allow students to take note and absorb what he said.

5. You created an environment of learning where disruptive behavior was dealt with in a manner that did not further disrupt class learning. This was a very successful lab class.

Sincerely,

M. Hui,

School Director
### APPENDIX M

**M. BLENDED PROGRAM 12TH, 11TH, AND 10TH TERM 1 AND TERM 2 FINAL GRADE SCORES**

**Blended Learning 12th Grade Term 1 and Term 2 Final Grade Scores**

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APPENDIX N
N. NON-BLENDED PROGRAM 12th 11th 10th TERM 1 and TERM 2 FINAL GRADE SCORES

Non-Blended Learning 12th Grade Term 1 and Term 2 Final Grade Scores

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