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Blended Learning as an Instructional Strategy to Improve Academic Performance

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COLLEGE OF EDUCATION

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2018

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Abstract

Higher education institutions in Barbados have introduced blended learning as a strategy to improve students' academic performance and achievement. Despite the implementation of blended learning, the poor student performance and outcomes persist. The purpose of this qualitative case study was to explore how teaching processes and practices at the institution have influenced blended learning to improve student achievement. A social constructivist framework was used to guide the study. The research question addressed the practices and processes used by teachers to increase student learning and performance in a blended learning environment. Data collection involved semistructured interviews with 6 teachers from the study site. Lean coding analysis yielded 4 themes: student engagement, student success, pedagogical and technological challenges, and teacher professional development. Findings were used to create a teacher professional development program for local stakeholders with an emphasis on pedagogical best practices and processes for creating and sustaining an effective blended learning environment. Findings may be used to improve student engagement and academic success at the study site.

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Dedication

I dedicate this doctoral study to the two most prominent people who share my life, my husband and my dad. With their guidance and faith, I remained motivated to complete this course of study successfully. I dedicate this work to the memories we shared during this journey.

Acknowledgments

I am very much appreciative of the role my husband, Hayden, played in ensuring that I followed my dreams of achieving this qualification. There were sacrifices made, and he was there with me to provide the needed support and motivation. I wish to acknowledge my heartfelt thanks and eternal gratitude for his kindness and never-ending love.

My best friend played an instrumental role in ensuring I stayed on track and remained focused on achieving my goal. Through my darkest hours, he was my guiding light. I thank him for his friendship and faith. Thank you for seeing me through to the end.

The guidance and support provided by my first chair, Dr Robert McClure, was invaluable. I truly appreciate the patience and kindness he showed during this process. Dr Orr's contribution as reviewer and then second chair allowed for improvements, and I am especially grateful to her for being with me to the end. I am grateful that the study site permitted me to complete this project study, and I am especially thankful to the leadership for considering the findings as they continue to institutionalize blended learning at their college.

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Section 1: The Problem

The final responsibility for tertiary education in Barbados falls on the government, through the Ministry of Education, Science, Technology, and Innovation (METI), where principals at each institution receive mandates for curriculum innovations and reforms. The role of the METI is to monitor the performance of each school and college, intervene when needed, discover the reasons for the problem, and develop corrective action for its improvement. Goodlad (1991) stated that often the curriculum is handed down from top management, and this is the case for educational institutions in Barbados.

In addition to the METI, the board of management at the institution under study played a critical role in supporting the blended learning program. Both government-appointed organizations shaped the roles and expectations of the faculty by introducing blended learning into the curriculum to improve student academic performance and achievement. The board, acting on the METI's policy directives, provided policies and curricular innovations at the institution under study.

The Sam Jack College (SJC, pseudonym) was established as a department under the METI as a postsecondary institution catering to students 16 years and older. Training is relevant to the college's mission as a Technical and Vocational Education and Training (TVET) institution. The mandate of the METI guides the philosophy and vision of the institution as it relates to the training needs of the country's workforce.

The principal, who is assisted by two deputy principals, manages the SJC, where one deputy principal is responsible for administration and the other for academic matters.

The tertiary institution is required by METI to establish teams that are responsible for the development and periodic review of curricula. This structure reflects the relationship between the METI, the board of management, the senior management team, and the middle management team consisting of academic heads of divisions and administration heads of divisions (Barbados, 2010).

The organizational structure of the SJC is made up of divisions offering general education, vocational training, and occupational training. Industry sector nomenclature is used to classify some divisions, for example, agriculture and building trades. Other divisions are classified by vocational subjects, for example, motor vehicle engineering, welding, electrical engineering, mechanical engineering, and printing. General education divisions include general studies, human ecology, and business studies (SJC, 2016).

Introducing blended learning at the SJC was intended to offer a more innovative way of delivering curricula to increase student engagement and academic performance. The deputy principal (personal communication, July 10, 2016) reported a general decrease in final grade point average (GPA) scores, persistent poor test scores, and declining graduation rates. An analysis of the GPA scores over a 5-year period showed a relationship between student success and performance and low levels of student engagement in theoretical courses (SJC, 2016).

As mandated by the METI, the institution was required to promote a learner-centered curriculum, encourage new teaching, and revise grading methodologies with the aim of positioning the student as the focus of the learning process. As a step to increase student academic achievement, the institution was directed to highlight the use of

blended learning technologies to guide student learning across the curriculum (deputy principal, personal communication, July 10, 2016). The blended learning initiative was created to handle these conditions; however, during the implementation, the program objectives began to change slightly. These changes were due to the organizational structure of the college, the types of courses offered, and the quality of students, which differed across each division (deputy principal, personal communication, August 3, 2016).

Kezar and Eckel (2003) established that environmental forces have a potential to influence curriculum changes in higher education. As early as 2000, the SJC redesigned the curriculum as a response to social change and the need for the college to be more competitive in the global environment (Cozier, 2000). According to the SJC's annual student statistics report for 2006-2010, previous strategies implemented included the modularization of courses to include a competency-based approach, the development of national certification to replace international certification, and a readjustment of the distribution of the grading systems. The report also confirmed that SJC also initiated in-service training for teachers to ensure relevance to Information Technology and Communications (ITC) and TVET skills.

In assessing the effectiveness of the existing blended learning programs, the SJC considered program indicators relating to the organizational structure, the school community, and the programs' outcomes. The organizational indicators included monetary outcomes, school leadership, and governance of the institution; the school community outcomes included on the program's impact on student engagement,

performance, and achievement. The program indicators included the processes and practices used by teachers during the delivery of the blended learning program at the institution. For the SJC, the program indicators played a critical role in determining whether the program objectives were met (deputy principal, personal communication, July 10, 2016).

The Local Problem

Academic achievement involves mastering competencies and obtaining knowledge during the learning process. With academic achievement being the focus of the SJC's vision, the declining levels of graduation rates at the college became a matter of increasing concern for the METI and the board of management of the college; these concerns prompted a change to the teaching paradigm. Research confirmed that blended learning offers benefits such as a flexible learning environment with opportunities to increase students' learning and achievement levels (Alseweed, 2013; Demirer & Shain, 2013, Kazu & Demirkol, 2014). These researchers also found that blended learning creates growth in the retention of knowledge and an increase in the interest of the student in learning, as well as higher levels of motivation in the course (Norris, Sporre, & Svendsen, 2013).

The SJC student data for 2006-2010 also revealed that the types of students entering SJC had begun to change. The reports indicated that students began arriving at the SJC with poor literacy and numeracy skills, little motivation toward learning, and learning styles geared toward the use of technology. An analysis of student graduation rates indicated early warning signs of high levels of student failure within a 5-year

period. Results pointed to the fact that a single failure in any course dramatically reduced the likelihood of students graduating. The report also indicated that students who were failing to maintain the required GPA were at risk of dropping out.

In 2013, the SJC implemented the blended learning approach to improve student performance and achievement. The blended learning program was designed to address issues related to low levels of student success and performance outcomes at the institution by providing online student-centered approaches. In addition to facilitating blended learning, the teachers' roles in managing the teaching and learning process consisted of organizing course content and activities (J. C. Richardson et al., 2015). Berge and Muilenburg (2003) also noted issues similar to those the SJC faced, for example the unexpected impact on workload, the changing roles of teachers, the quality of training required, and the teachers' performance in a blended learning environment. Findings from the current study showed that technology issues, bandwidth problems, and faculty's use of and experience with e-learning technologies hampered the SJC's blended learning program.

SJC's Mission Statement

According to the SJC Handbook (2015-2016), the mission statement speaks to the institution as being the leader in preparing a highly skilled labor force through promoting competency-based technical and vocational education as a prerequisite for the lifelong learning needs of students. Since its establishment, the SJC has helped learners to acquire certification of their competence to function at the entry level of their chosen vocations. The mission statement further speaks to a requirement for instructional staff to be more

aware of their roles and responsibilities and to have the required knowledge to employ the appropriate teaching styles (SJC Strategic Plan, 2010). A challenge the college faced with its traditional curriculum was not accommodating students' learning styles, which was mainly due to the shortage of time, personnel, and resources required to fulfill its mandate (deputy principal, personal communication, August 15, 2016).

SJC's Strategic Plan

The plan advocated for improvement in academic quality and challenged the teachers to offer students a meaningful approach to learning with current teaching and learning strategies including the integration of technology into the classroom. The plan was intended to accommodate students who prefer a specific learning environment to enhance their educational experiences (SJC Strategic Plan, 2010). The strategic plan addressed the changing demand for tertiary instruction, including the substantial growth of applications in the 16-20 age group, students who were prepared to trade face-to-face delivery for online learning, and students who were expecting program content that addressed their vocational paths. These factors called for a fundamental change in instructional practices and illuminated the need for blended learning (deputy principal, personal communication, August 9, 2015). Teachers were required to ensure that a social presence was created to encourage higher student achievement and performance (J. C. Richardson et al., 2015).

One of the chief goals of the SJC's blended learning policy, which coincided with Goal 7 of the Strategic Plan (2010), was offering at least one blended program per teacher each semester. Picciano, Dziuban, and Graham (2014) stated that blended learning

presents teachers with the opportunity to take full advantage of the strengths of each approach by providing students with a more efficient way to learn. By incorporating a blended learning model, the institution hoped to address the various needs of students while ensuring growth in student academic achievement. Cuneo, Campbell, and Harnish (2002) cited individual characteristics such as motivation, literacy skills, computer skills, and learning styles as factors in the success of blended learning interventions.

SJC's Blended Learning Policy

According to the institution's policy document on blended learning, the primary objective of the program was to attain a student success rate of over 50% and improve the learning experiences of students by catering to their distinct needs and learning styles (Robinson, Cadogan, & Renee, 2015). Kolb and Kolb (2005) used the construct of learning style to describe a student's preferences at different stages of the learning cycle. The SJC applied the blended learning model as a pedagogical strategy that combined online and traditional classroom components and allowed on-campus students the opportunity to complete aspects of their courses using Moodle.

This curriculum reform, founded on the need to accommodate diverse learning styles, was also aimed at intensifying learner engagement and generating opportunities to improve student grades. Cuneo et al. (2002) cited individual characteristics such as motivation, literacy skills, computer skills, and learning styles as factors in the success of blended learning interventions. The SJC's policy document listed the primary objectives of the blended learning program as follows:

- "produce a campus-wide environment that embeds blended learning as a means of enhancing the learning outcomes of students,
- develop an environment that permits enhanced interaction and collaboration between faculty and students,
- integrate technology and face-to-face teaching to support student learning experiences and outcomes,
- provide a supportive technical infrastructure for the effective and competent delivery of instruction, and
- reduce the economic impact on the delivery costs of education at the institution" (G. Robinson, Cadogan & Renee, 2015, p. 2).

According to the SJC's policy document on blended learning, another objective of the program was to craft a quality assurance framework that will result in enhanced and consistent instruction. From an institutional perspective, this quality assurance framework was also intended to encourage lesson planning, monitoring of course content, and timely feedback to learners (G. Robinson et al. 2015).

SJC's Blended Learning Model

The SJC's blended learning model provided teachers with the prospect of uploading their lecture notes, learning activities, and assessments using Moodle. This model allowed the SJC to practice a constructivist approach by providing opportunities for the students to acquire knowledge using inquiry-based or project-based instruction with the support of teachers. The current study revealed specific components of Moodle tools that assisted teachers in addressing student engagement and performance.

The college's blended learning program combined face-to-face practical hands-on classroom sessions with theoretical activities in an online setting. The students attended on-site classes to complete the hands-on aspects of their trade skills (carpentry, welding, masonry, and engineering) while also completing online asynchronous learning activities. Coursework took the form of continuous assessment and allowed students to participate in e-portfolio development, graded discussions, assignments, and online examinations. Students were also required to engage in self-directed learning through online research and discussion forums (G. Robinson et al., 2015).

Staker and Horn (2012) indicated that traditional classroom activities such as lectures and labs could be moved online so students could study with flexibility. By using multidisciplinary practices and technologies, teachers moved students beyond the restrictions of the classroom into the online environment. By examining student grade distributions, the deputy principal (personal communication, August 3, 2015) detected signs that the exclusively face-to-face method of instruction was no longer effective for the technology-driven students attending the college. According to the deputy principal (personal communication, August 15, 2016), the SJC's blended learning model provided teachers with an increased opportunity for personalized instruction and group practice.

A constructivist approach was at the core of the blended learning program. The results expected from this move included an increase in students' success rate to over 70% throughout each division at the institution (division head, personal communication, August 3, 2016). If teachers had fully incorporated blended learning into their face-to-face programs and provided students with the opportunity to complete their courses in an

online environment, the program outcomes would have been achieved (division head, personal communication, August 3, 2016). According to Chubb (2012), by moving the loads associated with the teacher-centered instruction to blended learning, there would be other opportunities for teachers to engage students individually or in small groups.

At the launch of the blended learning program, the principal (personal communication, August 3, 2015) suggested that the paradigm shift would foster a more engaging and student-centered approach to teaching that would result in an improved learning experience for learners. The principal further stated that the digitization of course material and assessments would allow students to access their coursework using text, audio, or video, thereby catering to the learner's learning style (personal communication, August 3, 2015). Social constructivism, which is the dominant theoretical framework supporting blended learning, places a high value on socialization and engaging in cooperative groups in the quest to create and progress knowledge (Chubb, 1978).

Program evaluation. An evaluation of the curriculum was carried out at the end of the 2014-2015 academic year to assess the effectiveness of SJC's instructional strategies. The program audit findings showed that although students were committed to using Moodle to supplement their instruction, issues that hampered their progress seemed to lie with some faculty members, as well as the design of the blended learning courses (division head, personal communication, September 10, 2016). According to the head of the division of the distance education, the program audit addressed the impact of blended learning on face-to-face instruction to enhance student performance. However, it did not

address the practices or processes used to influence the effectiveness of blended learning (division head, personal communication, 10 September 2016).

The survey targeted 110 students between the ages of 17 and 24 from each division that used blended learning as an instructional strategy. In the questionnaire, students reported their satisfaction with their blended learning course. The responses were on a scale from "strongly agree" to "strongly disagree." The division head indicated that most students (61%) were satisfied with the professional format and layout of their course. However, the division head added that when asked if the assessment activities and tasks were appropriate, the results showed a high level (75%) of dissatisfaction. Most students (65%) were also uncertain about the ability of their blended learning course to keep them focused on achieving the course objectives or enhancing their learning process (division head, personal communication, 10 September 2016).

The division head further stated that when asked about the amount and quality of interaction with their instructors and peers, most students (63%) indicated that they were not involved in the online activities and assignments. These results were not significantly different from previous surveys, and this emphasized the need for training in understanding how to present various learning activities to the students to promote interaction (division head, personal communication, 10 September 2016). The division head also stated that over 75% of the students agreed that the right use of technology would increase their engagement, and he proposed that teachers should seek ways to better engage students by providing more meaningful online activities.

Consistent with the findings from Gedik, Kiraz, and Ozden's (2013) study, the instructors at the SJC reported that the blended learning environment placed both a physical and cognitive load on them. The extra load included the amount of time spent redesigning the content, preparing learning activities and assessments to be uploaded, responding to students' posts, and assessing students' online work (division head, personal communication, 10 September 2016). Although the SJC's study offered valuable information on students' experiences in a blended learning environment, the data collected did not address the best practices required for student success in a blended learning environment.

SJC's action plan. The leadership of the institution recognized that despite the implementation of blended learning, challenges of poor student performance and outcomes continued to be present at the college. Further, the study showed that teachers did not fully use blended learning as a means of improving their quality of teaching and their students' motivation to learn by using the Moodle (systems administrator, personal communication, 18 August 2016). The constructivist approach was intended to create an atmosphere in which students would learn at their pace and build their knowledge, but teachers did not use it throughout the SJC (systems administrator, personal communication, 18 August 2016).

Implementing blended learning was perceived as reaping little success regarding supporting continuous and lifelong learning. The deputy principal indicated that blended learning did not increase the levels of student academic performance as anticipated considering that the expected 50% success rate did not materialize (deputy principal,

personal communication, 5 September 2016). As shown in the current study, one of the critical issues involved the willingness of some teachers to use the technologies to improve students' learning experiences. Another issue that impeded the smooth completion of courses included faculty's struggles with the processes and practices involved in translating and teaching their courses in an online environment.

According to the SJC principal, teachers struggled with the pedagogy required to implement valuable learning practices using blended learning (principal, personal communication, 9 August 2016). According to the principal, academic staff did not confidently integrate blended learning in a manner that was consistent with the program objectives. Lower graduation rates and student reports provided evidence showing the lack of innovative approaches used by teachers to apply blended learning in their programs. The principal added that if blended learning had been correctly used to enrich the quality of students' learning experiences, the school would have been able to meet goals of the strategic plan (principal, personal communication, 9 August 2016).

Before the implementation of blending learning, the school's leadership faced a decision on whether to maintain the status quo or promote changes to the instructional methods of teaching. According to the deputy principal, leadership of SJC decided the latter by introducing blended learning (deputy principal, personal communication, 15 August 2016). The mandate was set forward by the METI that the SJC to make every effort to ensure that the curriculum adequately served the diverse learners. The SJC was offered blended learning as a solution that would provide students with opportunities to increase their knowledge and improve their academic performance.

When compared to the traditional form of teaching, the blended learning approach appeared to have a more positive influence on learning (Alseweed, 2013; Demirer & Shain, 2013; Kazu & Demirkol, 2014). To ensure the blended learning initiative could be successful, the leadership of the college needed to gain a better understanding of the issues or challenges involving the practices and processes used by teachers using blended learning. The current study was conducted to provide an understanding of the practices taken to promote student outcomes and the processes used to provide learners with opportunities to enhance their performance.

Rationale

The primary objective of the blended learning program was to stimulate higher levels of student performance and increase graduation rates at the institution. Although the research showed that blended learning has the potential to increase student performance, enhance students' knowledge, promote collaboration and communication, and provide feedback (Porter, 2013), this was not the case for the SJC. Graduation rates indicated only small increases in students' overall performance after the implementation of the blended learning initiative (SJC Annual Student Statistics Report, 2015). Not being able to meet the expected 50% success rate caused concern among the SJC leadership. There was a need for research to provide stakeholders with a greater understanding of the processes involved in establishing an environment that would enhance student performance using the blended learning approach.

Teachers often failed to use blended learning and integrate technology into their instruction even though the appropriate technologies are readily available (Kurt, 2014).

The findings from this study offered the educational community a framework for using best practices in blended learning as a means of enhancing student achievement and performance. Traditional approaches to teaching and learning are being replaced rapidly by the introduction of technology into the classroom (Hayfa & Othaman, 2014; Zipporah, 2014).

In the Caribbean, there have been few published studies that addressed the relationship between blended learning and student performance. Administrators at the study site need to know what kinds of technical and pedagogical support staff should have to ensure that the blended learning program is fully operational. The purpose of this study was to identify practices and processes used by teachers to impact student learning and performance in the blended learning program.

Definition of Terms

Active learning: The practice of providing learning activities that require the gathering and use of information and promote critical thinking and problem-solving (Glossary, 2015).

Asynchronous learning: Instruction, engagement, and learning do not occur at the same time, but take place at different times (Kumar, 2012).

Blended courses: Courses that require students to complete course requirements online and in a traditional classroom (Horn & Staker, 2015).

Blended learning: An instructional method that combines traditional face-to-face education with e-Learning (Horn & Staker, 2015).

Digital resources: Resources that were created using digital technology to disseminate and access learning material online (Morgan, 2014).

E-assessment: Any electronic tool that supports formative assessment (Morgan, 2014).

Engagement: The process of giving students meaningful activities, so they become actively involved in acquiring new knowledge (Alrushiedat & Olfman, 2013).

Face-to-face courses: Courses delivered in a traditional learning environment, which is either lecture based or instructor-led in a face-to-face setting (Morgan, 2014).

Hybrid courses: Courses in which instruction is delivered partly online and partly face-to-face (Morgan, 2014).

Information technology (IT): Various types of computer hardware, software, telecommunications technologies, and multimedia tools that are used to input, process, and store information (Webb, Gibson, & Forkosh-Baruch, 2013).

Information and communication technologies (ICT): The use of computers, communication networks, and the Internet (Webb et al., 2013).

Instructional designer: A person who use the principles and theories of learning to design learning materials and experiences for online or blended learning courses (Morgan, 2014).

Instructional designing: The practical use of learning and designing content to create teaching and learning materials and experiences for online or blended learning courses (Morgan, 2014).

Instructional media: Teaching materials that are used to motivate and encourage student learning in online or blended learning courses (Morgan, 2014).

Learning management system (LMS): An online platform such as Moodle that gives students access to a range of online activity modules (Psycharis, Chalatzoglidis & Kalogiannaki, 2013).

Online course: A course in which all activity is completed online (Kumar 2012).

Online learning: Education in which instruction is provided over the Internet (Morgan, 2014).

Online learning resources: Digital materials that are used for supporting student learning in blended or online courses (Kumar, 2012).

Synchronous learning: A learning activity in which students interact at the same time and in the same environment (Kumar, 2012).

Web 2.0: Technologies such as podcasts, social media, videos, wikis, and other online communication tools that form part of the virtual learning environment (Morgan, 2014).

Significance of the Study

At the time of the study, there was limited research on practices and processes used by teachers to impact student learning and performance in blended learning courses. This study provided insights into the practices and processes used by teachers at a technical and vocational institution in the Caribbean. Understanding what teachers did as they assimilated technologies into their teaching practice may serve as a model for technical and vocational colleges. There is a need for educators to understand the

importance of ICT in higher education as they seek to implement blended and online programs geared toward millennial students (Daniel-Gittens, 2013).

This study allowed for an investigation of the processes and practices used to increase students' success rate in a blended learning program. I considered the strategies faculty employed during the process of moving from traditional types of teaching and learning to blended learning instruction and assessment. I explored how teachers incorporated technology with face-to-face instruction to create improved student learning outcomes. Daniel-Gittens (2013) recommended that educational institutions in the Caribbean should consider blended learning as a *panacea du jour* to address educational problems. There was a need to address the ineffective implementation of blended learning at the SJC.

Identifying the issues contributing to increasing student achievement using blended learning provided valuable insight into ways to enhance student achievement. The results of this research may enable stakeholders to modify their blended learning program to increase student academic success. Determining the best practices and processes to be used in implementing blended learning in a technical and vocational training college may create a pathway for improving student performance and achievement.

Jung (2011) stated there is a need to observe the traditional learning environment and explore ways in which digital instructional tools can support the varying needs of students. Gradel and Edson (2010) suggested many people lack clarity on the best practices for using blended learning technologies. The findings from the current study

provided stakeholders with a better understanding of how faculty practices impact student performance and achievement in a blended learning environment.

The results of this study added to the body of knowledge that guides TVET institutions in adopting and implementing blended learning as a strategy for improving student performance. Furthermore, the findings provided instructional designers with insights concerning blended learning effectiveness and the roles of students and teachers in online classrooms. The study site may be in a better position to advance the institutional strategy to support an increase in student learning outcomes using blended learning.

Research Questions

This research addressed the practices and processes used by teachers to impact student learning and performance in a blended learning environment. Creswell (2012) stated that qualitative research provides an opportunity to examine trends and explore phenomena. The analysis of the findings assisted in determining the best practices and processes associated with the instructional strategies used to increase student performance in a blended learning environment. The following research questions (RQs) were used to guide the study:

RQ1: What are the processes and practices incorporated into the blended learning classroom by the teachers at a technical and vocational institution in Barbados?

RQ2: What are the processes and practices of teachers to enhance student learning in a blended learning classroom at a technical and vocational institution in Barbados?

Review of the Literature

This literature review addressed the benefits, barriers, and challenges associated with implementing blended learning in teaching and learning. I also examined the disadvantages of using blended learning as a pedagogical strategy. I began by identifying the search protocol for locating appropriate literature on the subject. After discussing the conceptual framework for this study, I examined various definitions of blended learning. Finally, blended learning as a strategy for improving student engagement and performance achievement was reviewed. It was essential that the stakeholders at SJC understand the practices teachers used as part of their blended learning programs.

Literature Review Search Strategies

Using the Google Scholar search engine, I included search terms such as *blended learning*, *annotated bibliography*, *social constructivism*, and *literature review*, and + *2015* to refine the search results. Key words and descriptors used in the search included *blended learning*, *hybrid learning*, *technology-rich classrooms*, *case study*, and *qualitative study*. Peer-reviewed journals were examined using MERLOT Journal of Online Learning and Teaching database for local trends and data regarding conducting program evaluations. Searches for articles were limited to those published between January 2014 and December 2017 on blended learning at tertiary institutions. The titles and abstracts were marked off for the following criteria: blended learning implementation at tertiary institutions; blended learning as an instructional strategy; and blended learning best practices.

Additional searches for scholarly, peer-reviewed articles were conducted using Education Resources Information Center (ERIC), EBSCO, and Google Scholar using synonyms for blended learning and student performance. I evaluated titles, abstracts and articles for the inclusion criteria. This literature review contains studies that addressed the impact of blended learning on student academic performance and achievement. This reviewed also addresses the everyday experiences shared by tertiary institutions that implement blended learning in their traditional instruction.

Conceptual Framework

I used a social constructivist framework, which views blended learning as a source of collaboration, interaction, and motivation to help teachers and students create a learning environment (see Ebert, 2015). Social constructivism is the learning theory for the digital age, as well as the environment where teachers and students work together to explore and create new knowledge (Paily, 2013). The social constructivist model focuses on personalized learning within the context of social learning and therefore sees knowledge as a human product that is socially and culturally constructed (Paily, 2013). Cleary, Horsfall, and Hayter (2014) noted that qualitative research is entrenched epistemologically in social constructivist theory. This approach is also relevant for research in an educational context. According to this approach, the teacher's role is a facilitator who ensures that children are exposed to real-world experiences and are actively involved in the learning process by having exposure to integrating technology in their learning (Aldoobie, 2015).

Learning is a social process that occurs when people engage with each other; it is not a journey of passive development but rather an active one that is shaped by external forces. A person can create meaning through his or her social interactions with others and the environment. The importance of learning through social engagement, interaction, and collaboration originated from Vygotsky (1978) who held that learning is associated directly with social development. Vygotsky's theory of learning states that is a social process that allows students to grow and develop based on their interactions and socialization with other people.

The social constructivist approach to this study allowed for the examination of how learners were presented with materials to follow up on their performance. Social constructivists consider the types of tools that are used by teachers to regulate their learners' online presence and their usefulness to the course. In alignment with the tenets of social constructivism, the interview questions for this study gave teachers the opportunity to reflect on their active involvement in the blended learning process. Participants were able to consider the types of learning opportunities they offered to the student to achieve the learning objectives through reflection, critical thinking, and creativity.

Vygotsky (1986) emphasized that students should be guided in the learning process and felt that teachers should make every effort to assist in their students' learning. Vygotsky suggested that teachers use scaffolding techniques to provide students with the necessary information and encouragement at the right time. As required in a blended learning environment for cognitive development, Vygotsky felt that teachers

should be central to their students' learning. Vygotsky further recommended direct and guided teaching to assist in students' cognitive development, while stressing the need for peer interaction and cooperative learning.

A Review of the Blended Learning Literature

Defining blended learning. Alammary, Sheard, and Carbone (2014) observed that there is no simple definition of blended learning. Blended learning happens when students learn in both a brick-and-mortar environment and an online environment with control over the path, methods, pace, and utilization (Horn & Staker, 2015). Hilliard (2015) defined blended learning as a training modality that combines traditional instruction with digital technology to improve knowledge and skills that students can transfer to the workplace.

Blended learning is envisioned as a model that will assist teachers in integrating technology and allow them to use face-to-face instructional classes to meet the different needs of the students (Kleber, 2015). Kleber addressed modern students who have diverse learning needs that educators need to meet by using technology. Throughout this literature review, the definitions of blended learning include effective instructional strategies for teaching with technology in and out of the classroom. Teachers will benefit from using blended learning through improved classroom efficiency, increased teaching flexibility, more convenience for student learning, and better learning outcomes through engagement and collaboration (Owston, York, & Murtha, 2013).

A primary objective of blended learning is to enable higher learning and enhance learner-centered pedagogy (Shibley, 2014). The move from an instruction paradigm to

the SJC indicated a transition from an individualistic learning environment to one that was supportive and collaborative. Integrating technology into the classroom was a new teaching environment for the school, and significant adjustments were needed for SJC to take a social constructivist approach to encourage collaboration and interactions among students. As such, blended learning activities will need to involve students being able to access emails, e-books, e-journals, complete online assessments, and collaborate using discussion forums and chat rooms (Mohammadyari & Singh, 2015). As we move toward the use of digital technology in modern-day education according to Benson and Kolsaker (2015), this will mean being able to offer students opportunities to learn in an online setting, using an LMS, for instance. As such, we must also consider Gurung and Rutledge (2014) view that some digital learners will require training and advice on how to use technology to promote their learning.

In considering the blended learning theory, Huang, Ding, and Zhang, (2007), posit that student engagement is achieved when the curriculum is well-designed; for example, by bringing several types of learning activities and tools together as part of the learning process. Huang et al. (2007) further suggested the use of emails, discussion forums and chat rooms to enhance student engagement and learning. The authors explained that using such tools to incorporate technology into the classroom, along with teacher support, will raise student engagement and motivation and consequently their learning and academic performance.

In addition to Huang, et al. (2007) suggestion to use learning tools in blended learning, Noorminshah, Mazleena, and Oye, (2012) discussed the use of PowerPoint

presentations, video, and audio clips, to complement course material or clarify challenging areas. They also noted that the flexibility of the LMS and its tools to promote group work would make it appropriate for both collaborative and independent learning. Each of the tools they described is proven to promote decision making, problem-solving and provide more learning opportunities for student success. This literature review will continue to show similar views for a successful blended learning program.

Pedagogy of blended learning. Blended learning pedagogies has been recognized as a path to improve student collaboration and promote academic performance, and substantial evidence provided by Poon (2013), recommended that blended learning support student success and achievement. Emphasizing the necessity to move beyond individual needs by focusing on the social context of learning, the author suggested the use of social constructivists learning theories, which will include collaborative learning, interactive learning, and authentic learning.

Blended learning is a pedagogical method that combines the social, cognitive and teaching opportunities of the face-to-face classroom with the online environment, rather than focus heavily on one delivery modality. As other research studies have shown (Poon, 2013; Wallace, 2014), blended learning delivery contributes to improving student learning outcome and often results in receiving higher grades, more knowledge and a better understanding of theories and concepts. Trowler and Trowel (2010) noted a significant challenge that adopters of digital learning face, includes the design of pedagogy that offers students enough support to improve their levels of engagement.

Blended learning as an instructional tool, is promulgated as a source of collaboration, interaction, and motivation to help both teachers and student create a learning community (Paily, 2013). As with such curricular reforms, stakeholders will become concerned and preoccupied with the role teachers played in ensuring the program's success. Koch's (2014) research looked specifically at how online learning transformed the instructor-centered traditional classroom into a student-centered classroom. According to the author, blended learning moves the responsibility of learning to the student and significantly changes the role of the instructor. The participation of the instructor becomes more valuable in the online environment, and therefore they should not assume a passive and nondirective role in their teaching or their students' learning. It will, therefore, be sensible to consider the role instructors play in ensuring a high-performance rate with their students in both the face-to-face and online environments of the course as this can influence learning in various ways (Koch, 2014).

A modest transfer from face-to-face to blended learning does not mean to good pedagogy; therefore, teachers must learn to blend their practices correctly (Garrison & Vaughn, 2013). De George-Walker and Keeffe (2010) suggested, to achieve this type of success, teachers will have to look at the entire curriculum, rather than "*tacking on*" or "*weaving through*" various approaches. Blended learning must be focused on personalize learning and engagement of learners, as well as assist as a tool for online assessments with regular feedback (Horn & Staker, 2011). The authors spoke of having learning activities move from within the walls of the classroom to take place online through the

use of technology media or an LMS. By interacting in both environments, the authors believe that a social and teaching presence occurs.

Associated with the pedagogy of blended learning, is the challenges that it brings regarding changing the attitudes of teachers to maintain online interactive resources rather than just merely providing face-to-face instruction (Hofman, 2014). The author reinforced the point that interactions that educators and students have in the blended learning environment must be active as its absence will motivate the student to withdraw. Wikan and Molster (2011) also found that teachers who used blended learning solely for lesson preparation or the sharing of notes, would not be able to enhance students' cognitive presence. To avoid this, Oliver and Stallings (2014) suggested that teachers must select the most suitable instructional methods that will encourage successful outcomes in both environments.

Considering that blended learning joins face-to-face learning with using technology (Koch, 2014), shifting to blended learning will allow learning to be more productive for teachers if they have sufficient teaching tools and time for instruction. Various studies throughout this review also offered similar opinions concerning the need for both the student and teacher to have more time to prepare content and navigate the blended learning classroom (Horn & Staker, 2011; De George-Walker & Keeffe, 2010).

As observed in the following section, several studies have considered the benefits of selecting suitable instructional methods using Web 2. 0 tools to encourage successful outcomes (Martin & Parker, 2014; Amandu, Muliira & Fronda, 2013). Therefore, one can argue that further exploration regarding the links between blended learning pedagogy

and teachers' practices will be valuable for teachers who have to design engaging learning experiences and activities to give students immersive blended learning experience. Equally, just as the students learn in different ways, teachers teach in different ways. McDermott (2016) study found that teaching with technology alone cannot significantly influence student achievement, but by combining the technology with constant instructional methods student learning will be enhanced.

Blended learning and student engagement. With the introduction of blended learning, it will be necessary for stakeholders to understand if any relationships between an increase in the student achievement and performance exist due to blended learning. Teachers will be required to use various technologies and media in their teaching practices to encourage students to learn independently and collaboratively (Zainuddin & Attaran, 2015). There are myriad definitions for student engagement, nonetheless, Huang and Chiu (2015) linked the structure of the blended learning environment and its pedagogical strategy with student achievement, based on the types of learning activities offered by the course. Huang and Chiu felt that the emergence of this type of education will improve student learning and achievement if the focus is on the students' social and cognitive presence in the classroom. Kidder (2015) further supported the view that student engagement and success rates tend to improve with technology aided teaching.

Throughout this section of the literature review, research showed that blended courses should use Web 2. 0 technologies with face-to-face instruction to complement each other and reinforce learning. Norris, Sporre, and Svendsen (2013) also provided evidence that the use of Web 2.0 tools will offer students better opportunities to become

active participants in their learning. They promoted YouTube and Facebook, as innovative ways to approach learning and knowledge sharing, claiming that these tools have a powerful impact on learning. The ability of teachers to adapt and adopt the blended learning pedagogy is critical as studies reveal that this approach increases student engagement and student performance. Abu Al-Rub (2015) expressed concern regarding the ineffective use of technology for instruction.

Using Web 2.0 technologies in higher education builds relationships because of the collaboration, mentoring and coaching that occurs as part of social presence (Seiver & Troja, 2014). In this context, Halili, Razak, and Zainuddin (2014) revealed that using technology to promote social presence in the classroom, students can learn collaboratively. Such technological tools can offer students the opportunity to communicate asynchronously and synchronously using interactive features of the LMS, to maintain student engagement in the course (Martin & Parker, 2014; Amandu, Muliira & Fronda, 2013).

Psycharis, Chalatzoglidis, and Kalogiannakis (2013) recommended the use of an LMS as a platform that offers teaching and learning support at the institutional, faculty and student level. The authors established that the use of an LMS is a social constructivist approach to learning and teaching by providing an environment where learners are encouraged to create their knowledge. The general conclusion is that the blended learning requires teachers to move away from their lecture method of instruction and adopt new constructivist teaching strategies. The integration of digital technologies is meant to

create new learning opportunities for student interaction with teachers, peers, and content both inside and outside the classroom (Krasnova & Ananjev, 2015).

Hayfa and Othaman, (2014) cited student collaboration, student and faculty communication, active approaches to learning, instant student feedback, better time management, and regards for varying learning styles as necessities for competently encouraging student performance. As Tomlinson and Whittaker (2013) proposed, when students take active roles and remain engaged, they are likely to succeed, based on an increase in self-efficacy. The instructor's presence is a critical construct to consider in the facilitation on the online aspect of blended learning. It is obligatory to observe at this point that while blended learning can provide students with unlimited access to a variety of learning resources and activities, finding the right balance between what is offer face-to-face and online is the most critical factor for instructors (Krasnova & Ananjev, 2015).

Blended learning and student success. De George-Walker and Keeffe (2010) evaluated the pedagogy of a blended learning classroom focusing on learners and how they can successfully learn. It is important to note that the authors proposed a hybrid curriculum as an answer to improving student engagement, learning, and performance. Comparative views were supported by Demir-Kaymak and Horzum (2013), Liaw and Huang (2013), and Tang and Lim (2013), who agreed that online modes of study are associated positively with student achievement.

Dauod and Mahmoud (2013) examined the effect of blended learning on student achievement using two randomly chosen secondary schools. One school was the controlled group (n=31) and was instructed using the face-to-face methods; the next

group was the experimental group (n=32) and trained in a blended learning environment. Using achievement tests which they developed, statistical differences between the average scores of each group were found indicating that blended learning could positively affect student academic performance and achievement.

Deschacht and Geoman (2015) analyzed two groups of undergraduate students with similar characteristics to the SJC. The findings showed that those students who used the blended learning delivery model improved their academic performance. Xu, Huang, Wang, and Heales (2014) experimental study similarly confirmed that the benefits of blended delivery include improvement of student's examination performance and engagement from using a personalized online learning environment. Moreover, institutions using blended learning have shown to have reduced student dropout rates and superior success rates, proving that it improves student academic performance (Gedera, 2014). Considering these facts, we can say that is a need for colleges to prepare their students and more importantly, their faculty for the adoption of blended learning.

A web survey of over 500 teachers reported that 70% experienced increases in their students' standardized scores and marked increases in student achievement through increasing the active learning experiences for use at home and school (Brunsell & Horejsi, 2013). They cited curriculum specialists as advocating for this use of Web 2. 0 tools to support learning, free up class time, increase teacher-student interaction and efficiently deliver lectures. Brunsell and Horejsi recommended the use of Web 2. 0 tools for improving the quality of teaching and opening more opportunities for student collaboration and engagement.

Halverson, Graham, Spring, Drysdale, and Henrie, (2014) argued that blended learning instruction can be the most feasible instructional method that has the potential to raise student performance. Their study stressed the need for concentrated efforts to ensure that learning experiences in the blended learning classroom provide for high levels of student engagement, an instructor-supportive environment, and opportunities to ensure learner satisfaction. The main conclusions drawn from this study applauded blended learning instruction as the most feasible instructional method that will have the potential to raise student performance.

Challenges with blended learning. Deviating from the benefits of using blended learning, some studies recognized challenges in successfully integrating blended learning into tertiary education programs. While the above research showed many benefits to blended learning including an increase in student engagement and performance, there are others who felt that blended learning negatively impacts student performance. For instance, Cavanaugh, Sessums, and Drexler (2014), presented several matters considered as detractors to student achievement in a blended learning environment. Their study found no remarkable difference in academic success between the traditional and the technology-aided modes of instruction.

Researchers noted that the use of Web 2. 0 tools in a blended learning environment was associated positively with better learning outcomes and final grades (Goyal & Tambe (2015). The study found that students showed positive outcomes with the LMS which improved their understanding of the course from sharing study material.

It is rational therefore to argue that Web 2. 0 tools contribute to student learning and is a useful educational tool.

Despite the strong case that blended learning will reduce the student's workload, Lowes and Lin (2015) found that increased workload for students who now must go beyond classroom learning to online learning is very challenging. Beck (2010) also found that students fall behind on their assignments as the online and face-to-face work will increase. He also found that since a significant amount of the content is online, students may not be able to interact with the material especially if they are not able to access the material or understand the material presented to them. The newness of engaging in blended instruction is as confusing to the student who now must learn new technologies such as using discussion forums and chat rooms (Lowes, 2014).

Results of Hill, Chidambaram, and Summers (2013) study, showed that blended learning instruction allowed for more exceptional student performance but these findings were contrary to comparable studies in this review. Similarly, Kwak, Menezes, and Sherwood (2013) study presented the idea that blended learning does not affect student academic performance. Using various studies which compared face-to-face with blended learning to support their claim, the authors stated that student performance and success is not affected based on the delivery mode used in the teaching and learning process. They posit that students perform equally in both learning environments.

Gedik et al., (2013) evaluated some challenges teachers meet when teaching in a blended learning environment. Some of these challenges centered on the need for related training, the limited time associated with the digitizing and uploading content and the

lack of technical support to use the platform efficiently. However, more importantly, they reemphasized the point that teachers need technical support to employ technology effectually. Successfully designing blended learning environments will require an analysis of the teachers' technological background and students' learning capacity. Gedik et al., also discovered that instructors found that blended learning placed a burden on them cognitively and physically as they should redesign modules, prepare materials for uploading, provide feedback and grade online assessments. Also, their research confirmed that high levels of effort are required for blended learning to efficiently implementing it.

Similar evidence was produced by Tshabalala, Ndeya- Ndereya, and Merwe's (2014) from their study at a South African University. This study highlighted faculty challenges to include time constraints, lack of experience, an inadequate support structure, and an increasing workload as barriers to successfully preparing and using blended learning strategies to promote student performance. The instructional design of the course, the collaborative activities and the organization of learning material will impact learner satisfaction in the online environment (Lim, Morris & Kupritz 2014).

An argument that underpins this research is that of Richardson et al., (2015) who saw the teacher's new roles in blended learning to include preparing instructional and learning materials, managing the students' learning processes, organizing course activities, providing course content and preserving the learning environments. However, despite growing interest in blended learning, if teachers are not adequately trained to perform these tasks, they will be challenged while navigation the blended learning

environment, and inadvertently fail to establish a social presence to eliminate the feelings of isolation (Richardson et al., 2015). Hofman (2014) confirmed that when the user gets into difficulty with technology, this may lead to the abandonment of the learning and eventually, failing to use the technology.

As research suggests, facilitating online learning requires the teacher to have an active voice. Elia, Secundo, Assaf, and Fayyoumi (2014) found similar challenges associated with the student's ICT competence and their attitudes toward the use of ICT for teaching and learning. Therefore, all of these aspects may contribute to teachers failure to integrate technology into their instruction even though the appropriate technologies are readily available (Kurt, 2014). The most prominent challenge, then, will be finding ways in which the teacher can successfully use technology ensuring the student's commitment, considering the individual's learning styles. The implications for these findings will need to be addressed by the opportunities the institution puts in place for professional development and technical support.

Blended learning processes and practices. Kerr's (2015) study on online education in the Caribbean adequately summarized recommendations for addressing the issues highlighted in the literature as affecting the use of blended learning as a strategy for improving student achievement. These include the use of forums to act as reminders of tasks, guidance to completing such tasks and summaries or review of the discussion topic. To boost student academic performance, the respondents promoted the use of live chats and the use of social media as part of the teaching and learning process. The study also found that the timeliness of teachers' feedback will encourage interest and

motivation to complete the assignment in addition to clarifying uncertainty on the subject matter.

Regarding the structure of the course, Kerr (2015) study revealed that the fast pacing of classes; the deadline for assignments and the quality of material uploaded, significantly impeded the student's academic performance where the online environment was concerned. Blended learning also creates a digital community, which allows students to connect socially and cognitively in addition to engaging in reflection to sustain learning. These elements constitute a supportive environment which will provide for better learner engagement, performance, and satisfaction in the blended learning environment (Kiviniemi, 2014). Blended learning offers teachers a solution to increase student engagement and lower dropout rates when compared to traditional face-to-face teaching.

A considerable challenge for tertiary institutions implementing blended learning lies in the difficulty teachers experienced in acquiring new learning technology skills to foster an online learning community and facilitate online discussion forums (Moskal, Dziuban & Hartman, 2013). As such, successfully designing blended learning environments will require an analysis of the teachers' technological background and students' learning capacity. While it is evident the blended learning has many advantages; the key is to be able to use it effectively by maximizing the benefits of online teaching materials with face-to-face materials while maintaining the motivation of the learning and teacher support (Tomlinson & Whittaker, 2013).

Conclusion

The review of this literature presented studies that together, show patterns of practices used by teachers to create and sustain student achievement and academic performance in a blended learning environment. The authors represented a diverse population as well as those with characteristics similar to the technical and vocational institution under study. Results of their respective studies offered detailed accounts of results of studies in blended learning, undertaken using the constructivist theory. While each study presented referred to a particular context, concrete and actual examples of implementing a blended learning approach illuminated the opportunities and challenges that are relevant to best practices.

Several authors addressed the research questions in the literature in various ways, but each included a discussion of the various challenges and benefits faced by tertiary institutions in implementing blended learning as a solution. Another common suggestion put forward by most authors is that blended learning is a successful strategy to create and sustain student achievement and academic performance in a blended learning environment when successfully implemented.

Implications

After the implementation of blended learning, it is necessary for stakeholders to understand if any relationships between an increase in the student achievement and blended learning existed. The focus of this study was not to discover if one is causing the other but more so to find out if the presence of technology in the classroom will predict an increase in the student engagement and performance. While the integration of

technology offered the SJC many new opportunities to deal with issues such as varying learning styles, student-centered instruction and student engagement, the processes used by the teachers to create and implement blended learning affected the achievement of program objectives.

Introducing blended learning required teachers to move away from their lecture method of instruction and adopt new constructivist teaching strategies. As with such curricular reforms, stakeholders will become concerned and preoccupied with the role faculty play in ensuring the program's success. By examining the perceptions of the relationship between blended learning and student achievement, a framework was developed to lead the institution into providing a higher quality of students learning experiences that will enhance student achievement.

The implications for this study addressed the opportunities the institution put in place to start and sustain the students' readiness to engage with the learning experiences and the instructional support offered to faculty to present meaningful engagement in both environments. The results will be useful to faculty in providing them with a greater understanding of the practical use of integrating technology in classrooms, which cater mainly to technical and vocational studies. Instructional designers will also have information that will assist them in redesigning blended courses to facilitate greater student-student and student-instructor engagement.

Section 2: The Methodology

In this section, I describe the case study approach used to understand how teachers implement blended learning as a strategy to improve student academic performance. I further explain why this design was suitable and present the criteria used for selecting participants. This qualitative project study addressed the processes and practices used by teachers in a blended learning environment to increase student success and improve student performance. An explanatory case study was appropriate to investigate this phenomenon as it was bound to a specific site, the SJC (Creswell, 2012; Yin, 2009).

Research Design and Approach

I used a qualitative study approach to understand how the blended learning model impacted students' performance at the SJC. This method was selected to provide heuristic and vivid reflections of the situation so that the stakeholders may have a clearer understanding of the phenomenon under study (see Merriam, 2009). Qualitative research provides a better understanding of a person's experiences and behavior that they use to form meaning (Bogdan & Bilken, 2007). The intention of this study was not to obtain generalizable findings, but to understand the phenomenon well. Creswell (2012) defined the case study research method as a qualitative approach in which the researcher explores the case by using interviews, reports, and observations for the data collection.

Consideration of different approaches. Various types of quantitative research designs would have been suitable for this study. The use of a quasi-experimental method would have allowed for the comparison of groups of students who were part of the

classes with technology and those who were not (see Lodico, Spaulding, & Voegtle, 2010). However, I did not seek to examine differences between these two different groups. Instead, I examined the role teachers play in altering the level of student engagement and achievement through the integration of technology in their traditional classroom. A quantitative design would have called for a larger sample size (Lodico et al., 2010), which was not feasible given that only a few teachers took part in the blended learning initiative during the academic year before this study.

I examined the processes and practices used in blended learning to meet the program's objective of attaining high student success rates. An experimental design would not have been suitable for this type of investigation because I was not including an intervention. A correlational design was not selected because there was no need to examine the relationships between variables (see Creswell, 2012). A survey design would not have allowed for flexibility in participants' responses. Using a case study approach enabled me to gather rich, thick data and provide a deeper understanding of the phenomenon (see Creswell, 2012).

A case study approach can also be useful in exploratory mixed-method designs when the case study is applied to achieve a quantitative end such as testing a hypothesis (Creswell, 2012). Further, Lodico et al. (2010) noted that the information gathered in surveys may allow participants to describe their perceptions, attitudes, or experiences, toward the research topic. It was not my intention to use an exploratory mixed-methods approach because the purpose was not to gather statistical data but to obtain data from interviews. Critical action research, also known as participatory action research,

combines critical theory with the traditional form of action research. The purpose of practical action research is to improve educational strategies and innovations by examining the practice itself (Creswell, 2012). The researcher can serve as the instructor in this type of the investigation; however, because this was not my intent, this approach was also rejected.

The instrumental case study approach. Although an intrinsic study may be done to know more about a person or phenomenon, an instrumental case study is developed to encourage an understanding of specific issues. By using the case study approach, I aimed to investigate the practices and processes used by the instructors in their technology-rich classrooms. This case study approach includes empirical inquiries using semistructured interviews to investigate the issue in a real-life context (Yin, 2014). This technique permits the researcher to concentrate on a given situation in great depth, during a limited time to identify interactive processes at work (Yin, 2014). This approach ensures that interviewees receive a fair amount of attention and that their perspectives are explored in greater detail than would be possible with other approaches.

I used a qualitative instrumental case study design to understand the processes and practices teachers used in their blended learning courses to impact student outcomes and performance. This study was instrumental because it addressed the interaction between teachers and the blended learning curriculum. The blended learning curriculum included a social constructivist approach, and an instrumental case study was the most appropriate design for this study. Yin (2014) explained that this type of case study confirms, challenges, or extends the fundamental theory, which was the aim of this study.

Participants

This research was concerned with an examination of a bounded case, specifically an instance of blended learning education as represented by a single program designed to improve student performance. This qualitative, instrumental case study included eight teachers who participated in the blended learning initiative. Creswell (2012) stated that when researchers use purposeful sampling, they deliberately handpick participants and places to gain knowledge on the central phenomenon. There was a relatively broad representation of faculty according to age group, gender, academic rank, online experience, and division.

This study was bounded by the teachers using the blended learning approach to improve student performance at the SJC. The selection of a specific case for this research proceeded through purposeful sampling using the teachers who fully participated in the blended learning pilot (see Table 1).

Table 1

Demographics of Blended Learning Pilot

Department	No. of instructors	No. of students
Automotive and welding division	5	30
Building trades	5	30
Electrical engineering department	5	30
General studies	5	30
Mechanical engineering & printing	5	30
Human ecology	2	30
Agriculture	4	30
Business studies	5	30
Total	36	210

Research Sampling Techniques

Purposive sampling is a non-representative subject of a broader population designed for a specific purpose or need, such as choosing information for an in-depth study (Choy, 2014). Purposive sampling involves finding and choosing individuals or groups who have experienced the phenomenon under study (Creswell, 2012). When used appropriately, this technique of data collection is efficient and practical, when compared to a random sampling approach.

The teaching staff at SJC understood the curriculum and the approach the college functioned and, therefore, was the representative sample group for interviews. From this

group, teachers who used Moodle collaborative tools such as the discussion forums; Moodle assessment tools such as quizzes and Moodle evaluation tools such as the grade book were chosen to participate in the study. As Creswell (2012) recommended for this type of research, a few participants should make up the sample frame. Therefore, the sample size was enough to provide detailed data. Additionally, a smaller sample size allowed for more time to create participants with an atmosphere conducive to conducting interviews (Bogdan & Bilken, 2007).

Potential participants were identified for this study by the researcher after assessing the existing data from reports. Evaluation reports on the teachers' use of Moodle during the blended learning implementation provided the necessary details to identify two instructors from within each of the eight academic divisions. These teachers used Moodle collaborative, assessment and evaluation tools and were employed full-time at the college and working in the various divisions. This information was captured in the invitation letter (see Appendix B).

Each participant was required to respond to the following questions indicating the use of blended learning as a strategy for improving student academic performance.

- I used Moodle collaborative tools such as the discussion forums and/or online chats.
- I used Moodle assessment tools such as quizzes and/or assignments.
- I used Moodle evaluation tools such as the grade book and/or activity reports.
- I work full-time in the following department (circle one): Agriculture, Building Trades, General Studies, Human Ecology, Business Studies,

Electrical Engineering, Automotive, and Welding or Mechanical Engineering Division.

Based on the number of responses, eight teachers were selected to participate in the study (See Table 2).

Table 2

Description of Participants

Participant	Gender	Division
Anne	Female	Agriculture
Geoffrey	Male	Building trades
Hayden	Male	General studies
Malcolm	Male	Automotive and welding
Bridget	Female	Human ecology
Lystra	Female	Business studies
Shawn	Male	Electrical engineering
Zara	Female	Mechanical engineering division

I considered teachers who indicated they used blended learning as a strategy for improving academic performance and eliminated those indicating they did not use blended learning. The final participants ranged in age from 25 to 50 years, with no less than two years' experience teaching in a blended learning environment. The gender distribution among participants and relationship status was not critical to the selection process. All the participants were of West Indian heritage and trained in using the Moodle platform.

Interview Protocols

Creswell (2014) defined semi-structured interviews as verbal interchanges where the interviewer prods information from the interviewee using a series of questions. Creswell (2014), added that a one-on-one interview is more useful for questioning respondents who are not fearful to share evidence. Interviewing is critical as researchers can understand how persons feel about a specific situation; therefore, having a discourse with respondents using interviews will allow the researcher to determine how the situation is understood in the respondents' mind (Merriam, 2009). Creswell (2014), suggested that interviewing offers in-depth information connecting the participants' experience and viewpoints of a topic. Through formal interviews and informal communication, I obtained participants' perceptions of the blended learning program implementation and student achievement.

I probed teachers who participated in the blended learning program on their practices and processes used to impact student learning and performance. The interviews took a standardized open-ended approach as suggested by Gall, Gall, and Borg (2007) using a structured scheduling instrument to collect data. One of the advantages of using the interviews as the data collection method is that it is flexible and affords the researcher the opportunity to ask the respondents for clarification and confirmation (Gall et al. 2007). The interviews allow the researcher to gather descriptive data from the participant's perspective and advance insight into how they interpret the phenomenon under study (Patton, 2002). The interview process was the most suitable data collection

technique for this study, based on the supposition that the research questions represent the specific implications and positions of the interviewees (Patton, 2002).

Participants' risk. The interviews began with formal introductions and a review of the purpose of the research. To safeguard minimum levels of soft risks, (for example, embarrassment, and confidentiality), each participant was reminded that they could withdraw any time they were uncomfortable. The interviews were carried out in an atmosphere of ease and comfort as it was essential to put the participant at ease before questioning them (Smith & Osborn, 2007). This way respondents were able to talk freely about their experiences and feelings (Bogdan & Bilken, 2007).

Interview observation sheet. As the interview continued to the information gathering stage, I used an interview sheet to guide and record responses. Participants' perceptions of the implementation of the blended learning program for student achievement, were obtained by asking each participant the same open-ended questions. Specific questions focused on the teacher's presence in the online environment; the specific behaviors and actions used by the teachers to increase student performance; and the teacher's perception of the outcomes of the blended learning program and its role in student achievement.

Additionally, some questions, based on the responses of the participant, were rearranged to capture the teachers' reflections regarding the levels of student engagement they observed (Smith & Osborn, 2007). In wrapping up the interview, I reviewed vital points; clarified issues to confirm accuracy and gave the participants the opportunity to make general comments. At the end of the interview, I thanked the respondents and

arranged for future contact. The interviews sessions were audiotaped and later transcribed in their entirety.

Protection of Participants' Rights

When preparing for the data collection procedure, I considered ethical problems that may arise (Bogdan & Bilken, 2007). Correspondence to the college inviting permission to conduct the study and seek access to public documents that will be necessary for the study (See Appendix B). After approval by the IRB and SJC principal, I provided the selected participants with details referencing the purpose of the study and copies of the informed consent forms to sign before taking part in the study. Consent forms established that all data submitted would be confidential and safe from inopportune disclosure. The form also informed the teachers of any reasonably foreseeable minimal risks and benefits from participation, as well as the measures to be engaged to lessen those risks.

As a former part-time employee at the SJC, it was necessary to reassure the teachers that information they provide would not be disclsed or in any way damage their career. Due to my former association with the college, it was essential to inform the participants that association would not influence the study or skew the data, as this is an unethical practice (Fitzpatrick, Sanders, & Worthen, 2010). The interviews were held away from the college, in an atmosphere of ease and comfort. Interviews were arranged at the teacher's request to minimize inconveniences, disruption of work or personal obligations.

Considerable care was taken to ensure that teachers did not feel pressured to participate in the study. I repeated to the teachers that their involvement was voluntary, and refusing to take part or to continue participating will present no disadvantages or loss to them. I also informed each participant that they could break or end the interview if they so require. As suggested by Merriam (2009), an open and positive relationship was developed with each participant by letting them have sufficient time to respond to questions, voice their concerns and ask questions. According to Yin (2014), by allowing the participants to discuss the processes and practices, they used in their blended learning environment to encourage student success, allowed for a better perspective since they were also involved in the implementation process.

I kept participants' signed consent forms in a secure location separate from the interview sheets and data analysis documents (see Yin, 2014). These documents did not carry any identifying marks or information. Data, documents, and related information were accessible only to the researcher. Correspondence with the participants remained confidential; they were not copied or circulated to any member of staff at the college. This information reassured the participants that they would be protected from invasion of privacy and breach of confidentiality during and after the research process. A pseudonym identified participants during the research process and in the final report (Yin, 2014).

Data Collection

Creswell (2014) stated that as part of their qualitative approach, researchers should have more than one source for data collection purposes and do not depend on a single source. While Creswell listed observations, interviews, diaries, documents as

qualitative data collection tools, this research used semi-structured interviews. Using this data collection method allowed me to compile information and later validate through member-checking for accuracy. As I conducted each interview, the timings were logged in a diary to create a record and filed with the respective transcripts and audio recordings. This method of documenting and filing added credibility to this study.

The data collection method for this study reflected a qualitative study whereby semi-structured interviews in a conversational format were used (Creswell, 2014). To sustain the comfortable atmosphere and encourage further dialogue, I used open-ended questions to discuss the practices teachers used to encourage and promote higher levels of student engagement. Using open-ended questions provided more flexibility than closed-end questions; as well as offer an impartial and truthful means of collecting data with higher reliability (Bogdan & Bilken, 2007).

In preparing the interview sheet, (Appendix B), I used qualitative terms such as "*perceptions*," "*describe*," and "*experiences*." Yin (2014) suggested for choosing questions for a case study approach should include "*how*" questions and not "*why*" questions as these may create defensiveness of the interviewees part. Yin also advised that questions should focus on the phenomenon within a real-life context. A probing questioning technique encouraged the respondents to reply freely about their practices and processes used during the blended learning initiative. Avoiding leading questions and allowing the respondents to lead the interview encouraged teachers to be more open to voicing their views and experiences.

The order of the questions was organized to encourage the participants to remain focused on their responses (Creswell, 2012). Demographic questions gave background data on the teachers' experiences within a blended learning environment. It was important that this research related to the social context of the school to provide the reader with an idea of where the college was before integrating blended learning. Most of the questions directed participants to offer feedback regarding their experiences as a blended learning teacher. Questions also gather data on the participants' processes used to motivate students toward higher performance standards using blended learning. Questions discussed the challenges encountered, which may have hamper student performance. Specific questions focused on the teacher's presence in the online environment; the specific behaviors and actions they used to increase student performance; their perceptions of the outcomes of the blended learning program and its role in student achievement.

As the data collection technique was an interview, it was essential to have it audio recorded to produce a correct transcript (Creswell, 2014; Merriam, 2009; Yin, 2014). However, two participants (Anne and Malcolm) refused to be audiotaped, as their voices were easily identifiable and to maintain the credibility of the study; I eliminated these two teachers. All interview sessions took place in a quiet and comfortable location away from the college to ensure that it remained free from any distractions. Yin (2014), offers that interviews are the most valuable methods of data collection in case studies and therefore the interview sessions were set for a minimum of one hour, which allowed the interviewee sufficient time to respond to the questions.

Using an interview protocol adapted from Kasunic (2010), the interview sessions started with formal introductions and a review of the purpose of the research. I discussed sharing data, confidentiality and any other issues as part of this orientation stage. As the interview proceeded to the information gathering stage, I used an interview sheet to guide the interview and to record responses (Kasunic, 2010). In wrapping up the interview, I reviewed vital points and clarified issues to confirm accuracy with the respondents. I thanked respondents and made arrangements for future contact (see Kasunic, 2010).

I organized data throughout the study into a case record according to the sources, and public documents about the program outcomes (Yin, 2014). Each step of the research process was recorded chronologically as a means of creating an audit trail to ensure the reliability of findings (Merriam, 2009). By comparing the responses to the information provided in the documents, there was a better understanding of the data.

Data Analysis

In analyzing data, Creswell (2012) presented steps which involve preparing, organizing, and interpreting the interview data. By typing and reading the interview responses and comparing the responses to the information provided in the document, a better understanding of the data emerged. This process of corroborating evidence from the interviews and documents enhanced the accuracy of the research; Creswell (2012), referred to this process as triangulation.

Triangulation. Follow up interviews with participants were held to review interview transcripts and to perform member-checking for conformability. Engaging in this member-checking interview allowed the teachers to ask questions while checking the

transcripts to ensure accurate representation. Creswell (2012) regarded field notes as one of the primary data in qualitative research. Field notes and non-verbal data taken during the interview process provided additional details on the interviewees' reflections. The added dialog by teachers was noted and used to look for practices and processes that connected the vocational curriculum to blended learning.

It was necessary that the participants confirmed that I represented their thoughts and ideas accurately and that interpretations of my observations corresponded with their intent. The importance of objectivity in research was critical when conducting and presenting this research for the following purposes: to identify the facts based on credible information, and to interpret the results of the data based on the observable facts of the findings and not on our own subjective opinions (Lodico et al., 2010).

Analysing the transcripts against the policy documents and evaluation reports provided by the SJC, I was able to verify and corroborate the statements of the participants. The document analysis also verified the authenticity of the participant's statements regarding the availability of resources, the quality of training and the challenges they faced while teaching using blended learning. Creswell (2012), stated that coding in qualitative research is problematic, and efforts should be made to limit questions along the themes to categorize reoccurring concepts and experiences.

Coding strategies. Coding data in qualitative research can be difficult (Creswell, 2012) so I made every effort to keep questions along particular themes in addition to keeping the sample small, to identify reoccurring ideas and experiences. Coding was done using predetermined themes from the literature review, as well as emergent themes

from the data. Creswell (2012) stated that thematic analysis would provide the researcher with the opportunity to code data, categorized into various themes and note patterns. This approach was appropriate for coding as it allowed for the natural grouping of issues that would have influenced the perceptions of the interviewees. According to Creswell, coding involves taking text data gathered during the data collection process, segmenting sentences into categories and labeling the categories with a term. In using this approach, in coding themes, I first located the central categories that relate to the topic discussed.

Gall et al. (2007) stated that coding included taking the data gathered during the data collection process, breaking sentences into themes and labeling them with a term. A few noticeable patterns and categories that appeared during the member check and document analysis were narrowed down and selectively coded to fit the framework, which best served this research. The authors confirmed that sifting through data for shared themes will lessen bias during the interviewing process as well as within the study. The major themes of student success, student engagement, pedagogical and technological challenges and teachers' professional development were strong cases drawn from the data. A few discrepant cases from data that did not conform with the themed data were identified (Lodico et al., 2010). When these discrepant cases appeared, I reanalyzed the data to categorize a new theme.

Limitations

A limitation of this study centered on its design. The research was limited to a tertiary institution in the Caribbean who offers a technical and vocational curriculum, and therefore generalization to a broader population may be limited. Another limitation of

this study was the population as it was restricted to only those teachers who used blended learning as the primary instructional and assessment tool. The study was delimited to six teachers, as two of the participants are public figures and declined being recorded as part of the interview process. The fact that this study has such a small, purposeful sample frame, limited the ability to generalize based on the phenomenon investigated.

Data Analysis Results

This section reported on the findings from research conducted at the SJC, where blended learning was used to improve student performance. The first section details the teachers' reflections on their practices and processes used during the implementation of blended learning at the TVET institution. The next section discussed the findings, and significant conclusions are drawn from research findings using the conceptual framework.

Research Questions

This study examined the practices and processes used by teachers at a TVET institution which implemented blended learning as a strategy for improving student performance. The study also allowed for an examination of the challenges teacher faced during the teaching process, and the practices they used to overcome these challenges. The analysis will consider the technological capabilities of the teachers; their knowledge of best practices for using blended learning to encourage student engagement and the pedagogical gaps that hampered student success.

The research questions that this study sought to answer are:

1. What are the processes and practices incorporated into the blended learning classroom by the teachers at a technical and vocational institution in Barbados?
2. What are the processes and practices of teachers in a blended learning classroom at a technical and vocational institution in Barbados, to enhance student learning?

Themes Developed Based on Research Questions

Based on these research questions, the themes of student engagement, student success, pedagogical and technological challenges and teacher professional development emerged. The resources, tools, and activities that the teacher used to motivate the students, encourage collaboration and interaction with the content fell under student engagement. I discussed the practices and processes teachers used to advance and monitor student achievement under the theme of student success. The online challenges teachers faced are addressed with the sub-themes related to pedagogical and technological issues. The challenges, issues, and solutions for successfully blended learning opportunities, as discussed by the teachers, are listed under teacher's professional development. Table 3 (Appendix B) provides insight as to how these themes emerged from the data.

Theme 1: student engagement. Interviewees were asked to consider their most impactful uses of blended learning as a strategy for improving student engagement. Most teachers quickly indicated that they saw little impact when solely using the LMS for improving student engagement and achievement. They, however, noted that integrating

technology in their classroom reaped remarkable success due to the various types of technologies they use to engage the students. Lystra stated:

> "in the blended learning classroom, the students were more engaged with the material. They were able to get additional notes online, and as such, students were more prepared for exams… linking videos to in-class activities and incorporating online simulations engaged the students in the learning process and this knowledge was shown in their practical assignments".

Zara described using web-based interactive simulations to encourage further engagement. She indicated that along with the animation, simulations were a great digital tool that enabled her students to explore challenging concepts. Zara also used the forums to deliver whole group instruction to engaged students in targeted instruction based on their needs at a particular point in the course. Similar to Zara's responses, the other teachers agreed that the use of simulations and videos were the most impactful resource for engagement and delivery of related content in both environments.

A common practice for most of the teachers included using videos and simulations demonstrating how a particular piece of equipment work by having the students view the stimulation and video before demonstrating or practicing the task. Hayden's approach included using sample questions with the simulations, to check his students understanding before completing a test. Shawn used a similar approach in that he allowed his students to log into the LMS during class time to access related videos or web links. He added:

> "when students were unable to get online during class, I provided them with a series of guided questions that linked the online content they would access at home to the face-to-face content that they used during class, and this allowed them more opportunities to become involve in what was being taught."

Most teachers identified that another practice for using simulations and videos was to encourage engagement in-depth discussion and peer collaboration in the classroom. For example, using online video, Bridget was also able to promote student-student engagement and get students to show a more vested interest in completing their assignments. She also used the online option to encourage student interactions asynchronously by including a class lounge ungraded discussion forum. Bridget indicated:

> "I found that student engagement online increased when I had set up a "class lounge" discussion forum where "students were allowed to ask each other questions about assignments or discuss group work and other projects. Using the discussion forum as a class lounge acted as a motivator for students and engaged them in conversations about assignments and group projects".

An interesting theme that advanced from several of the interviews revealed various levels of concern about student engagement. Bridget and Zara commented that by including a point system for the online work, ensured student participation throughout the semester "as students will only work hard if they are given a grade*."* Both teachers encouraged online engagement by posting grades on a weekly basis so that students can monitor their performance. The teachers discussed how they incorporated various mobile

technologies, in their face-to-face instruction to sustain student engagement and achievement. They spoke about how they used these resources to infuse blended learning strategies across the curriculum to include mobile apps such as WhatsApp.

Shawn allowed students to interact with mobile technology using the chat facility to share core ideas from coming out of the class discussions. Hayden pointed out that using WhatsApp discussions during a class held the student's interest during academic sessions. He said, "when students had such opportunities to discuss coursework using mobile technology, it had a significant impact on their levels of engagement." Similar to other teachers, Bridget communicated and interacted with the students using WhatsApp and email as opposed to using the online discussion forums which offered superficial and limited engagement.

Bridget felt that "by having my students engage in bi-weekly quizzes during class using Kahoot, and completing self-evaluation questions online, students were more active in class." Bridget also infused activities and resources into her classroom to increase student engagement by uploading assignments that emphasized practical assignments that focused on authentic tasks. Lystra and Geoffrey agreed that students completed several online and in-class activities that were purposefully written to ensure fusion of both environments. Lystra added, "by including online scavenger hunts, web quests, inquiry searches for specific information helped with the student engagement."

To support engagement, Lystra also gave her students access web-based resources during her face-to-face sessions to improve their understanding of the content. Lystra said that her online resources typically consisted of reading assignments and additional related

information not included in the textbooks. She also uploaded PowerPoints on each chapter to focus the students' attention on key points as well as provide handouts from other textbooks. She did indicate that these practices did not propel the students to go online on their own as these types of resources did not sufficiently motivate them to access the LMS. An analysis of the responses indicated that most teachers accessed the LMS during class to give students the opportunity to view the relevant notes.

The teachers were further probed to discuss how they monitored student engagement utilizing the integrated curriculum. The teachers unanimously agreed that although the purpose of blended learning at the SJC was to cultivate an environment of higher interaction and collaboration between teachers and students, this was not always the case when it came solely to using the LMS. While most teachers interviewed understood how to allocate resources to encourage student engagement in a blended learning environment, each teacher used technology at different levels.

Most teachers felt pedagogical challenged in creating online activities that promoted interaction and encouraged students to contribute. Geoffrey confirmed that when the students used the technology to gain the skills needed for the course, they worked better on group work. He observed that in his class, students craved interactions with their peers and preferred to take part in learning that incorporated authentic group activities more so than "the teacher on the stage instructional approach." Geoffrey also noticed the students with higher levels of engagement extended more effort to complete assignments, ultimately leading to better academic achievement.

Results revealed that the teachers who used videos and simulations or combined with the LMS and traditional classroom discussion saw an increase in student engagement and an improvement in learning. The teachers felt that this form of technology brought the courses alive and allowed the students to use their senses to understand the more complex concepts and solve difficult procedures. Findings emanating from the data showed that blended learning cultivated an environment which delivered higher student engagement, collaboration, and interaction between teachers and their students.

Theme 2: student success. An examination of the interview transcripts showed universal support that integrating technology into the face-to-face environment helped in student success. In response to the significant differences experienced regarding students' academic achievement between the traditional and blended learning environments, the teachers felt the use of technology in their classrooms made a difference and did increase their student grades. The teachers confirmed that moving from the traditional environment allowed most students to become independent learners as they engage in using technology at home and in class to complete their assignments.

The consensus was that the slight increases in grades were primarily due to the extra time students were now being given to engage students in practical sessions. As a result of this lessened dependence on time, Geoffrey said that with the extra class time for practice, he was able to identify individual problems he might not have noticed before, provide immediate feedback and take corrective actions. He mentioned noticing some differences in grades as he could offer more practice assignments that engaged the

students. Bridget added that due to more class time, she was able to see an increase in student performance as she was able to focus on the students challenging areas. She too felt that the free time benefited her students as well, as she could reteach difficult online content in the workshop and engage students in gaining higher grades for practical activities.

Compared to student performance in the traditional environment, Lystra believed that blended learning slightly increased her student performance as she geared the technology toward increasing teacher-student and student-student interaction. She felt that this practice helped those students who were struggling, and that was the main reason they could master concepts and do better in exams. She added that the resources that students needed to expand their knowledge were accessible online and were able to influence their success.

For some teachers, the strategies used to incorporate blended learning into the curriculum was contingent on the subject area or the subject matter. To support students that were struggling, teachers ensured that they had access to videos and simulations that addressed central concepts. They also encouraged their students to work online at their own pace and consulted with them as needed. Bridget commented on the fact that her students asked more insightful questions when her course was taught using Web 2.0 technologies and their involvement in successful learning increased.

Teaching practices for Geoffrey also involved using instructional videos to help students practice and reinforce the course concepts that they met in the online presentations. Geoffrey found that the use of videos and audio attended to various

learning styles and assisted students in being able to review the content at their own pace until they could master the content. The use of electronic media and tools was central to teaching and learning strategies, in some divisions. Lystra chose to use PowerPoint presentations with the embedded quizzes, "as it helped engage the students." She felt that this strategy assisted students in becoming more involved in active learning, improve recall, and check their understanding of words and fundamental concepts. She also felt that students benefited with better grades due to the interactions with their peers as they "bounced ideas off, asked questions, and received feedback regarding right and wrong responses."

From examining the interview responses, the academic staff integrated specific online material to prepare students for their practical assignments or tutorials. Students were also encouraged to read the module presentations online, as part of their revision plan. Extra reading materials and web links were posted online to improve student understanding of difficult concepts. The findings concluded that the teachers who reported changes in students' success and higher levels of student achievement are those who reported being more experienced with technology.

Theme 3: pedagogical challenges. Despite concerns, the teachers displayed an appreciation of many benefits of blended learning. They were required to relay the types of challenges they encountered during the process of moving from traditional types of teaching and learning to blended learning instruction and assessment. The teachers lamented that they began their blended learning journey on their own and with limited support and training. They felt that if they were given specific training in creating,

designing, and using online resources and activities that there would have been more success stories.

The teachers stated that like them, some students were unsure how to use the LMS while others were not as ready to use computers for learning, and this presented them with another challenge. Shawn noted that using a smartphone is completely different from studying an instructional video and posting and answering related questions. He added that even when students appeared comfortable with computers, they were not ready to use computers to learn. A central opinion was that since some students were not oriented adequately to work in a blended learning environment, they remained confused about how best to learn in that environment.

The teachers discussed their perceptions of the blended learning program as implemented at the SJC. Hayden stated that the idea of transitioning from the traditional classroom setting to blended learning initially created concern for his students and it took a while before he saw student success. He suggested that student success in the online environment was also contingent on the teacher's as well as the student's confidence to experiment with Moodle. According to Hayden, "being able to use the full potential of e-learning remained difficult, because, for most students, the use of this type of technology was not consistent with their predominately hands-on routines."

Geoffrey concluded that student "readiness" is a vital factor in accounting for the student success using blended learning. In his description of the student's performance using blended learning, Geoffrey said that students still need to develop an attitude which will allow them to be self-directed learners. However, he pointed out that while students

had difficulty “trying to juggle work in both learning environments” they were still able to achieve higher scores compared to when they were only in the traditional classroom.

According to Shawn, students interest in the hands-on components of the course increased as they begun to use the technology but he had to encourage “and sometimes forced” the students to participate in the online aspects of the program so that they could get a better passing grade. He stressed that main catalyst for success at the TVET institution landed in the face-to-face environment, where teachers were better able to coach students, provide opportunities for exploration and engage in real-world learning activities. He further suggested that “when teachers can incorporate other forms of technology in their classroom, students will be able to reap higher success.”

Like the other teachers’ experiences, Shawn said his students struggled with the blended courses because the coursework was substantial and the practical sessions still had to be accommodated. He pointed out that although he spent extra time designing his blended learning courses, he “ended with the face-to-face elements running independently of the online materials and therefore the students this challenge students with a far higher workload.” Hayden suggested that if students were also oriented correctly, they would have been able to navigate Moodle and teachers would not have to be faced with the challenge of ‘working twice”.

Lystra reported that while some students were engaged in the LMS, it was merely to access information, as they did not know how to make posts or complete online quizzes. She also expressed concern about her students’ ability to navigate through the online content and use the support materials provided. Shawn also experienced

challenges as some of his students were working at a slower pace mainly because they did not know how to navigate the LMS. He stated that his students were at times overwhelmed by the demands of being online and face-to-face course, mainly because he was unable to "properly blended" his course.

The teacher's new roles were very different from the traditional classroom and expressed disappointment in not being trained for these unexpected roles. Each teacher indicated that for blended learning, they did most of the work needed to develop the online content for their courses. Teachers across the board commented that they were apprehensive about the additional workload involved in preparing blended learning materials and in finding time for additional training. In too many cases, the teachers indicated that did not fully anticipate the initial time and effort that was required, and this caused frustration and, in some cases, reduced interest. Zara added that "the resources and materials for my TVET courses do not exist at all levels, so I had to spend significant amounts of time developing these." The teachers noted that the transition from the traditional teaching approach to blended learning required an investment of significant time as they needed to find various resources to accommodate the various levels of learning and learning styles.

Bridget perceived that the changes in the teaching context forced teachers to redesign their teaching practices since e-learning was new to the faculty. She passionately stated that "teachers needed to know how to design the online components of their courses as they had limited professional development in constructing online TVET courses." She said that it took teachers several months to convert resources to fit the

online environment as well as and revise course material. Other teachers protested about being given the difficult task of preparing assessments for the online setting. Teachers also mentioned having to design activities since they were encouraged to present content with audio, visuals, and info-graphics. Teachers also had to discover ways to raise and sustain students' interest and therefore had to come up with ways to create them for each environment.

The majority of the teachers cited unfamiliarity and difficulty in adapting to blended learning for technical and vocational subject areas as the reason for not having a more significant influence on student performance. The students and teachers continue to prefer the traditional face-to-face lessons to the online lessons because they were used to the traditional learning environment. Some teachers felt that students' needs and learning styles were not considered well enough for the blended learning at SJC and this may have affected the student's level of engagement.

Theme 4: technological challenges. When asked to discuss the challenges they encountered that hampered student performance and achievement, teachers frequently spoke of not having access to adequate internet access; a poor network infrastructure; limited resources due to the demand for devices and inadequate training. The teachers felt that the most significant challenge which directly affected both them and the students were technical issues due to the high number of students going online at the same time.

Most teachers recognized that regardless of the affordances of blended learning, these usability challenges also prevented them from effectively using the LMS on the campus. The teachers indicated that gaining access to online resources at the college was

a challenge, mainly due to the slow speed of their internet connection and access to the computer labs. Depending on technology resources to be available and accessible during their class time was also challenging. The teachers repeatedly expressed frustration at the systemic technical glitches that prevented the students from being able to log onto Moodle while at the school or access the platform at home due to password or server issues.

According to Shawn, "for blended learning to be more successful, teachers' use of technology, online access, the devices, and software must work well and consistently." He noted that due to these issues, some students fell behind and this affected the overall success of the program. He discussed how challenging it was to apply specific lessons when the school server or the Wi-Fi was unavailable. As with the other teachers, Shawn indicated that he had to download the online resources and share during the face-to-face sessions, to accommodate students who could not get online to access the resources. He admitted that these types of struggles with technology always occur and represent an ongoing challenge for both students and teachers. Shawn also commented that "teaching using blended learning is wonderful when the technology works as intended."

The need for technical support and technical resources was a repeated issue among the teachers. According to respondents, the SJC's infrastructure brought technical challenges with students not being able to log on to the platform due to (1) server downtime; (2) the Campus' weak or jammed Wi-Fi signal; (3) slow or intermittent internet access, and (4) limited access to computer labs. The teachers emphasized that these issues were discouraging for the students and suggested that the SJC put protocols

in place for technical support when such problems arise on or off campus. Bridget recommended enhancing the technological infrastructure by upgrading the bandwidth for both students and teachers because of the increased amount of material, graphics, and video that relates is in the online environment. She also recommended adjusting the physical space within the classroom by adding more computers and Wi-Fi access points.

Theme 5: teacher professional development. Teachers were given the opportunity to discuss the processes and practices required in a blended learning environment, to affect student performance positively. Further probing required them to provide suggestions and recommendations for improving the program so that it can achieve its objectives. Considering the specific impact of blended learning at the SJC, Shawn suggested that if the program is to be successful, then it should not only be structured to improve student performance using the LMS but also through the integration of other technologies in the classroom. Most of the teachers believe that various teaching approaches should be used in education and using technology engages the students. They also added that it is better to have more technology in face-to-face lessons.

Lystra felt that teachers should have the requisite knowledge to be able to place their quizzes, assignments and other graded work, using the LMS. This way students not only have access to face-to-face but can go home and work on homework material that they may not have finished in the classroom. She said that the activities done online were not enough for active engagement with the learning material, and they need the knowledge to develop more engaging activities. Most teachers believed that this method

would improve the program, but it would require training for both students and teachers in using the LMS resources and activities.

Zara agreed with the other teachers regarding the need for ongoing training and suggested redesigning professional development at the SJC. She suggested the format should move away from only having an expert telling teachers what to do, to having supporting groups of teachers who can learn from one another with the guidance of an instructional designer and a curriculum development specialist. From the academic staff perspective, training would allow them, not only to understand the technology but also understand the pedagogy. She indicated that while teachers have much subject matter expertise in their respective courses, they did not understand best practices in teaching online or blended.

Bridget also felt the SJC's existing professional development program was inadequate, as it did not allow for enough time for adequate training. She suggested that more training was required to train them in best practices for exploring instructional strategies in the context of their specific group of students and types of TVET courses, for example, first-year students in building trades or second-year students in business studies. The teachers felt that the briefing provided to large groups of students at the start of the semester was inadequate.

Lystra stated that those responsible for student training were of the belief that since students were familiar with specific technologies already, they would be able to navigate Moodle easily. While that may be so for some students, the teachers indicated that not being able to navigate the platform negatively impacted on their enthusiasm and

capability to engage with those elements of the course. Lystra stated that it is of grave importance that one should not to jump to the conclusion that all young people are familiar with and enjoy using technology, just as it is important not to assume that teachers have experience teaching with technology. Again, the respondents stressed the need for training in this area.

A common observation among the teachers was blended learning remained as merely a movement from the teacher being the lone basis of information to Moodle as another source. However, the teachers indicated that on their own, they created a blended learning environment that permitted students to seek out other sources of information using the internet, and experience various ways of learning using technology. While most of the teachers did not have a consensual idea of defining blended learning, each of them was able to use various technologies to formalize and structure the self-learning process and facilitate evaluation. Some teachers felt that the introduction of blended learning as implemented at the SJC brought challenges that questioned the fundamental idea of what constitutes good teaching.

The consensus is that faculty will continue to be dissuaded with blended learning if they remain unfamiliar with effective online pedagogy; if they are not provided with the opportunity to observe and experiment online teaching before adopting it, and if they are not given adequate time convert to content that reflects a competency-based approach. Still, the debate at the college continues to rage on about what constitutes the practical use of blended learning technology to increase student performance and achievement.

Discussion of Findings

The following discussion reports on the practices and processes used by teachers during the implementation of blended learning as an instructional strategy to improve student academic performance and achievement. The themes presented addressed issues regarding the processes and practices incorporated to build and deliver content in the blended learning environment to promote student engagement and success.

Research Question 1

Research question one asked about the processes and practices incorporated into the blended learning classroom by the teachers at a technical and vocational institution in Barbados. Results of the study demonstrated a prevailing perception that a comprehensive approach to building blended courses is needed and leadership needs to provide the technologies, technical support, and services that are required to make the program successful (Vu, Cao, Vu, & Cepero, 2014). For most teachers, training needs to be put in place if teachers and students are to use blended learning efficiently considering that the transition process was complicated, without the required support and skills that it required. Vanderlinde, Aesaert and Van Braak (2014) stated that teachers' ICT competencies have associated with their levels of institutionalized ICT use. The interviewees' perception of the importance of the blended learning; their experiences with it and the conditions that surround its introduction, shaped their attitudes toward using it in their educational practices. The teachers saw it as a mechanism to distribute information to students more so than as an equivalent learning experience to face-to-face instruction.

Blended learning practices and processes. Based on the teacher's different experiences and skills in technology, students will have different experiences in learning. This result of the findings for the first research question showed that experience, technology, self-efficacy, combined with skills, knowledge, and confidence are the necessary tools to ensure teachers efficiently integrate technology in the teaching and learning process. These tools seemed to be lacking at many stages, and this issue needs remedying. These findings also discovered that the level of experience that teachers have in the use of technology was an essential factor that impacted their self-efficacy and their ability to be confident in using technology in and out the classroom.

Pittman and Gaines (2015) explained the integration of technology in the classroom is affected by the teachers' beliefs and attitudes and suggested training if teachers are to become skilled at regularly using technology. Most of the teachers provided persuasive arguments to prove that their teaching practices slightly transformed students' experiences by integrating technology in the classroom. The teachers indicated that using ICT tools daily influenced the way in which they delivered specific courses. Many of the teachers found while they could individualize their teaching, engaging students in the online learning process proved difficult for them as they were unsure of how to create enriched interaction using Moodle tools and resources.

While this instructional practice was common among the teachers, the idea of blended learning was a new form of teaching they needed preparing, especially regarding combining the face-to-face approach with the online approach (Kazu & Demirkol, 2014). The teachers at the SJC felt that further preparation at the institutional level is needed to

acquire these types of knowledge based on the types of technical courses offered by the college. To address these inconsistencies, Anderson (2007) suggested developing train-the-trainer sessions specifically for learning how to use e-learning tools faculty may overcome these issues.

The active learning processes that teachers used focused on completing regular learning activities in the classroom, such as practice assignments. The teachers confessed that they integrated technologies that were not part of the prescribed blended learning policies (mobile technologies, simulations, and gaming) to facilitate process-driven activities. They indicated that these tools assisted the students with more complex assignments which require students to demonstrate their command of the course material. The teachers felt that the technologies which they integrated into the classroom gave them the opportunity to fulfill their contractual obligations to the students.

The research supports the application of online games as an environment that promotes strategic thinking, and individual and group learning. The constructivist theory describes how game theory and learning can come together in a game to teach strategic thinking regarding how learners can create new knowledge through experience and interaction (Bruner, 1966). Starting from using simple online games such as Kahoot to using more interactive games, teachers were able to engage their students and make learning more meaningful. However, the teachers expressed concern that online learning was not as active as face-to-face instruction, as they were unable to provide students with sufficient opportunities to collaborate and engage with the content.

From a faculty perspective, the critical elements that affect their practices and processes teaching in a blended format surrounded finding ways to encourage student engagement; promote student success and overcoming pedagogical and technical challenges. Rehmat and Bailey (2014) considered teachers' professional development as being critical as it will diminish some of these challenges that teachers encountered when integrating technology in and out of the classroom. Faculty saw these challenges as significant barriers to enhancing student engagement and achievement through blended learning and repeatedly stress the need for teacher professional development.

Teachers expressed that they felt "burdened" and "anxious" about the new practice of placing greater responsibility for learning with the students. They accused the blended learning mode of overworking them at times (Winstead, 2017). The teachers were more accustomed to playing a passive role using these instructional practices, whereas the blended learning courses required their active involvement. Therefore, in the face-to-face classroom, the teachers continue to encourage collaborative work and reinforcing social presence, albeit with the use of mobile and Web 2. 0 technologies. The use of mobile devices in the classroom advance constructivism (Bruner, 1966; Piaget, 1973) and social constructivism (Vygotsky, 1978). In the constructivist world, it is vital that students create or construct their knowledge and teachers need a pedagogical framework for implementing the use of mobile devices as an educational tool.

Scott, Ribeiro, Burns, Danyluk, and Bodnaresko (2017), agreed that such training would offer teachers great affordances for online collaboration and discussed factors like those by the teachers in this study that impeded active group tasks. For instance, the

teachers repeatedly spoke of the need to have the knowledge and skills to be able to link pedagogy with the technologies, to ensure that the content offered to reach the students learning outcomes. Onah, Sinclair, and Boyatt (2014) confirmed that different patterns and levels of engagement along with different presentations of material are more conducive to blended learning students' achievement. Boettcher and Conrad (2004) confirmed that online activities should be balanced with more learner-learner and learner-content activities taking place as the course progress.

Blended learning resources and activities. Voogt and Tondeur (2015) determined that teaching with ICT is situational and for it to be successful, teachers must know their students, the environment, the infrastructure and the tools at their disposal. During the interviews, teachers shared that they used the blended learning instructional model with students to share resources and activities they believed complemented their learning. However, in the instances online activities were offered, the teachers indicated that they were designed poorly and therefore did not attract or maintain students' interest. The teachers saw the lack of interactivity and personal contact in the online setting, as a barrier to student success. For most of them, student activities should involve a combination of individual and group activities, with formal and supplementary activities to assist students with their learning.

Birch, (2016) advised that in the blended learning environment students should be offered with more occasions for choosing topics; determining the assignments to submit for portfolio assessment and determining whether revise their work using critical feedback from the teacher. They recommended that teachers offer content in a modular

fashion to provide students with choices when designing the online component of the course. They felt that apply these principles will create a more significant teacher presence as well as increase student participation and promote student learning.

Harris (2016) posit that since teaching is driven by technology, for effective integration to be possible, teachers also need to know how to revise curricula documents to infuse technology into the curricula. He added technology integration could enhance student learning when it becomes an integral part of teachers' professional development. Despite teachers' investment in the integration of ICT, the efficient pedagogic use of these tools remains a challenge (Ndibalema, 2014).

In some divisions, teachers had difficulty deciding activities to migrate to the online platform for their TVET courses. Again, such practices perhaps reflect a lack of understanding of how blended learning tools can potentially offer student success. Harris and Greer (2016), believed that by allowing students to have access to learning materials; demonstrate their learning; collaborate with peers and communicate with teachers will provide creative ways of working under, through and over the LMS. Solutions for equal and easy access to technological resources for must be put in place bearing in mind the blended learning curriculum needs (Al-Hariri & Al-Hattami, 2016).

New roles and responsibilities. Teachers felt that blended learning instantly changed their roles, as there were directed to move away from their traditional face-to-face roles to facilitate a more student-centered learning environment. Koch (2014) confirmed that teachers' roles will move from being a content expert to being a facilitator and would see the teacher as guiding the learning process and coaching the students so

that they can achieve the course's learning objectives. The faculty's new roles expected them to become familiar with aspects of instructional designing and the development of online coursework on their own. Jamal (2015) recognized that it is difficult to adjust teaching approaches to support overall student understanding of the curriculum.

Ndibalema (2014), confirmed that some teachers would actively resist using the blended learning when they were more comfortable with the conventional instructional methods. Irrespective of whether this reluctance was a result of disbelief that blended learning was suitable for a TVET institution, or the lack of supporting infrastructure, or the need for appropriate training, it influenced the mode the teachers implemented a blended learning strategy to enhance student performance. Such practices or processes it will alienate both teachers and students and divert them to use face-to-face learning (Namboodiri, 2017).

SJC needs to provide training for teachers with their new roles, or there needs to be the deployment of different staff who have the skills, knowledge, and ability to perform these roles. Namboodiri (2017) argued that professional development play a significant role in this blended learning integration, as it is the teacher who will implement the program. The teachers indicated that while they played roles such as instructional designers, curriculum designers, facilitators and resource persons, they used a trial-and-approach to incorporate the new instructional method. Most of the teachers confirmed that they did not possess the auxiliary skills needed to develop and deliver a blended learning curriculum in the manner the SJC implemented it.

Voogt et al. (2015), stressed the need for a professional development program that prepares teachers with theoretical and pedagogical training, coupled with technological knowledge specific to their subject area. Given the new roles, practices and processes that blended learning would offer teachers; research suggested providing a TPD program the offers guidance, specific instruction, support and collaboration among teachers. Building on this view, Meyer (2014) concluded teachers must be aware of theories which relate to blended learning and teaching to cultivate pedagogical abilities associated with course design and delivery. He added that the teacher must have some variability technology competencies including instructional technologies for the face-to-face class; and technologies associated with the LMS. In this regard, important distinctions must be made between teachers constructing knowledge with technology, as opposed to merely offering information using computers.

Using Moodle LMS. In addressing issues relating to matching the student's learning goals and considering their needs, teachers felt that solely using the LMS did not always cater for those less proficient students who require some degree of personal attention. Many of the teachers remained unclear about the pedagogical benefits of using the LMS solely as a blended learning strategy. Most teachers used the LMS as a storehouse for course resources, as they saw it as an opportunity to ease the burden of classroom work. Fernando, Laura, and Amparo (2014) showed that teachers' expertise with the LMS and students' perception of the value of the tasks are influential factors to meeting the achievement goals using blended learning. The authors established that the

value of the LMS, the support the teacher receive and the students' self-efficacy are further influences.

Not surprisingly, the teachers indicated that they were less enthusiastic about using the LMS but continued to merge the traditional and digital modes of teaching with minimal training and little technical support. The is a need for fitting technological orientation to the online platform and training opportunities should for such. Comparable the teachers at the SJC, there is a need for student familiarization and socialization in the online environment before accessing learning content (Drew, 2014). Such as approach can assist teachers and students alike, to feel less disoriented in the blended learning classroom (Namboodiri, 2017). The teachers highlighted the need for training that would focus not only on the skills of using the LMS or other technologies but also of giving them the opportunity to gain the necessary knowledge and experience in using blended learning to enhance teaching and learning (Rehmat and Bailey, 2014).

The consensus was that while integrating technology into the classroom added pedagogical richness by attending to the learning styles of students, using the LMS did not provide greater access to knowledge. Scott et al. (2017), posited, the use of the LMS alone does not lead to significant learning outcomes without introducing effective pedagogical practices. Specifically looking and the practices and processes teachers used to meet the requirements for blended learning, the teachers stated that their current practices for designing their blended courses needed to focus on the course objectives and developing course activities, assignments, and assessments for both environments.

This study has implications for how teachers use technologies within the LMS to facilitate communicating with students.

Teachers admitted that the practices and processes used during blended learning streamlined the dissemination of resources by using the LMS and increased student work in the face-to-face environment. However, they often did not offer the necessary pedagogical practices to promote student achievement and this lack of pedagogical support and reluctance to engage students online affected students' online collaboration (Scott et al., 2017). This study suggested that pedagogy, social interaction, and technology are the three major elements required for a successful blended learning experience. Adopting new approaches to embedding computer-based and internet-based technology in teaching and learning remained sporadic at the SJC since most teachers indicated they lack the skills and knowledge. Recent research on the effective integration of ICT in education points to uses that support constructivist learning philosophies as being most effective for enhancing student (Cigdem, 2015; Cigdem & Topcu, 2015).

Hilliard (2015), argued that such uses of technology require designing learning opportunities that allow for exploring and doing as well as for feedback and reflection. Hilliard further emphasized the importance of teachers training in the technical aspects of the LMS, its educational tools and its effect on student outcomes. He believed that teachers would improve their teaching craft in a blended learning classroom, as they find ways to enhance student engagement and subsequently improve student performance and achievement.

Research Question 2

This section addressed the processes and practices of teachers in a blended learning classroom at the technical and vocational institution, which seemed to enhance student learning and affect student performance. I also discussed the teachers' strategies to integrate blended learning across their curriculum. Teachers felt that the use of multimedia and online information had a noticeable effect on student performance and stressed the need to be formally trained in this area. Mayer (2001) indicated that multimedia could improve learning and retention of material presented when compared to lectures or learning materials that do not use multimedia. However, Mayer cautioned that multimedia presentations are most effective when the different types of media support one another, rather than when superfluous sounds or images are presented, which could interfere with learning rather than enhance learning. Then, training should be provided to faculty to address their varying needs for blended learning development.

Student performance. Alammary et al. (2014) projected that blended learning, with its online component, will prove to be an effective means of delivering instruction since it accommodates the diversities within the classroom, as well as adding value to the learning process. Specific concerns regarding student performance include the teachers having the requisite knowledge to design, create and implement resources and activities that will promote student engagement. The teachers felt that with adequate training, they would have been able to present adequate activities or resources for exploration and reflection, which are critical to a TVET institution. Rehmat and Bailey (2014) confirmed,

integrating technology into a lesson can become a challenge for some teachers with insufficient skills.

A frequent challenge involved in effectively using blended learning is the different approaches and activities needed to cater to students' preferred learning style (Harnisch and Taylor-Murison, 2012). The teachers agreed that while blended learning helped the learning process, they were not able to get the students to become independent, engaged and collaborative learners or cater to their various learning styles at all time. Further, they observed that students demonstrated various abilities and competencies that require them to vary instruction to motivate them towards student achievement. Harnisch and Taylor-Murison noted some students would prefer the flexibility of the online environment as the learning experiences will be more congruent with their learning styles. Most teachers felt that while the flexibility of blended learning afforded the student the opportunity to schedule their time accordingly, they also needed more time and training to be prepared to design content so that students can achieve the course learning objectives.

In considering the students' workload, the teachers felt that coupled with technical demands and other practical activities in the traditional classroom; students had limited time to meet adequately meet their learning goals. Voogt and Tondeur (2015) stated one of the shortcomings teachers faced when integrating ICT in their classroom, was the time allocated for that various lessons. The teachers agreed that the students needed a more balanced blended learning program that provided them with time to develop their competencies.

De Witte, Haelermans, and Rogge, (2015) resolved from their study that institutional dynamics play a vital role in teachers' decisions to use ICT. Teachers confined blended learning practices to particular groups, and therefore not all students benefited from blended learning resources. This confinement, which the participants believed created problems, concentrated on teachers who were unfamiliar with how to implement the new technologies were not always able to capitalize on the students' learning skills. Participants indicated that students missed out when teachers who were uncomfortable, returned to what they described as the 'old type' of teaching. Jamal (2015) acknowledged that while numerous activities can be incorporated into instruction, it was imperative that teachers know how to devise activities that would ultimately meet the requirements of the students involved.

Student engagement. A blended learning program calls for the students to be actively engaged in their learning and have a quality educational experience that "arouses their curiosity, strengthens initiatives and desires, and purposes" (Dewey, 1916 p. 31). The teachers in this study stressed their inability to provide student online learning experiences and opportunities to engage with the learning materials to acquire the necessary competencies. They felt that with the appropriate motivation, students would have access to the online components of the course and become comfortable working in that environment as well.

Critics of online learning have stressed the need for students to become comfortable engaging with online content as well as develop self-discipline to access the online environment as part of their learning process (Chen, 2017). Teachers in this study

used mobile devices as tools to help students carry out their tasks and promote the development of their intellectual abilities. Most of the teachers provided students with e-books, online reference sites, Kahoot to promote interactivity, thus enabling students to acquire knowledge at a personal level. Collecting data in the form of infographic, videos and audio recordings were additional activities used with mobile devices. These types of learning activities support constructivism as they are activities set outside the traditional classroom.

According to the research outlined in the literature review, blended learning courses are based on student-centered strategies, organization, assessments and collaborative activities. The environment should also include various means of interaction, content and learning experiences (Ghavifekr & Rosdy, 2015). The teachers included activities such as videos, self-paced learning lecture notes and assessment activities, which occasioned less student engagement than expected. Balzotti and McCool (2016) found that guided educational dialog in video format creates higher levels of motivation in students regarding their need to learn. They concluded that these resources would better integrate into the blended learning environment after teachers have identified their students' needs. Through the use of simulations, teachers presented the student with opportunities to learn by repetition and experimentation. The teachers felt that by presenting information in this manner, students were able to acquire new knowledge quickly and would have multiple ways to learn and achieve better learning outcomes.

Prestridge and Tondeur (2015), asserted that ICT tools are a shared resource leading to collaborative activities which will consequently improve the teaching and learning process, the teachers restricted online content to engage the students. The standard practices of the teachers included placing core learning content inside the classroom using a formal approach while the use of workshops, demonstrations, coaching, case studies and problem-solving tasks were dominant in the face-to-face setting. Such practices lead to low motivation in getting students to access online assessments, for example, and further created a sense of isolation. Students need to perceive both environments as having high interaction if they are to engage with the material for better learning outcomes (Young & Duncan, 2014).

Although the teachers employed various instructional materials and strategies in various learning contexts for their courses, they felt there were not always compatible with students' learners' learning styles and strategies. The teachers believed that by providing visual types of learning experiences and self-paced instructional materials, students were better able to explain the concepts for each unit as well as practice on the concepts taught. Poon (2013) emphasized the need for the face-to-face elements to be compatible with the online elements if the blended learning program is to be successful. The degree of change that would be required will hinge on the willingness of teachers, their curriculum area and knowledge of e-learning. Integrating technology takes time, and time was an issue for most of the teachers when they spoke of adapting the technology to create new pedagogical principles based on technology.

Kazu and Demirkol (2014) found that blended learning motivated learners to have unlimited access to information, in addition to providing a platform for trading ideas. They added that real-time feedback along with the best use of the technologies would allow for student interaction and engagement. Overall, the teachers admitted that their scarcity of knowledge in using the LMS did not allow them to take full advantage of its tools. Some of the teachers felt that if they could identify student disengagement early, then the students would have higher chances of success, while other teachers actively monitored student engagement in the face-to-face environment and were able to apply strategies to recapture their students.

Resources to support the students scheduling of the course activities lacked in most of the SJC's courses. Teachers agreed that the course design should be standard across the campus, following a logical structure with clear guidelines and instructions. Tuomainen (2016) recommended using consistent tasks, reflection and discussions as being essential for developing communications skills in a blended learning environment. The teachers decided that it is imperative to consider the overall layout, format, and location of components on the LMS, as students should be able to predict where to find different types of learning and assessment materials. Tuomainen added that feedback and peer comments create a balanced approach that benefits the blended environment.

While most teachers interviewed understood the need for feedback and follow-up on activities and assessment, a few of the teachers used self-tests, and mini "pop" quizzes to follow up on students' progress. The interviews clearly showed that there needs to be a renewed focus on summative evaluation to determine if each course addressed the

students' needs. The evidence from the literature review strongly suggests that in most situations, immediate feedback was more effective than delayed feedback. These practices and processes show that help is needed so that teachers understand the blended learning environment and this created the need for training.

Like Sharma, Sharma, and Sharma's (2017) study, the findings for this research question concluded that for the SJC to have an active blended learning program, there must be more than sufficient use of technology by teachers and students in the teaching and learning process. They added that teachers need to be knowledgeable in the use of Web 2.0 tools and other technology resources. Similar to this current study, Sharma, Sharma, and Sharma found that adequate and continuous training in best practices for blended learning will be required if teachers are to provide the basis for enhancing teaching and learning virtually in any discipline.

Adnan and Boz (2015) substantiated the claim that as teachers engage in blended learning transformation, they may do so with a minimal understanding of the pedagogic difference between online learning and face-to-face instructional delivery. The significant point of their observation is that traditional face-to-face teachers who attempt to create and design blended learning courses need the skills that are not part of the practices and processes of their traditional classroom. Adnan and Boz study found that teachers will mostly upload PowerPoint presentations online with little idea how to deliver the online content. These findings highlighted the fact that teachers often fought to discover ways to engage their students' understanding of the material; or to communicate in online. Arguably, their position from a study of college teachers engaging in developing and

delivering the online component of a course is that professional development relating to all facets of online instruction and development is necessary for effective transition to blended learning.

Conclusion

This section discussed the findings of the pedagogical use of blended learning as a strategy to improve student performance. The findings showed that while faculty appreciated the added flexibility of the learning environment, they noted that the challenges faced in developing their courses for the online environment. Such challenges included minimal time, resources and support required for course design; gaining new technology skills; and the risks `connected with delivering a TVET course in a blended format. Considering how these inescapable internal issues battered the institution, the need for assistance in instructional designing and course development was essential for faculty if they are to provide an environment that stimulates reflection, critical thinking, collaboration, and ultimately, student achievement.

Even though the teachers in this current study did not share a typical definition of blended learning, they were able to discuss specific instructional practices and processes for blended learning. Most of the teachers felt that the SJC's approach should include using additional technologies in the face-to-face environment and not solely rely on the Moodle platform. The teachers gave succinct descriptions of their blended learning experience agreeing that the traditional teaching methods remain dominant at the college since few teachers were invested heavily in using Moodle as expected by the leadership of the SJC.

Blended learning was introduced to the teachers at the SJC starting at the low end of the technology continuum; and now there is a need to take them a step further to more relevant technologies, to improve teaching and learning because improper use could create unfavorable consequences (Zipporah, 2014). Porter, Graham, Spring and Welch (2014) suggested a framework for institutional implementation of blended learning which begins at the awareness/exploration stage, then moves into the adoption/early implementation stage and ends with the mature implementation/growth stage. This framework identified the critical structure and support issues that address each stage of ICT training even with educated and experienced faculty. Introducing selected learning technologies to teachers based on their levels of experience with ICT in a manner that will build confidence, self-esteem, and motivation in their use for learning is appropriate.

Individual differences, prior technology experience, learning confidence and access to computers and the world-wide-web will continue to affect the rate of learning at the college. These deterrents are a perennial an issue in addition to training needs to address blended learning development and appropriate technological orientation. There should be professional development opportunities for teachers that provide opportunities for a practical application of e-learning and knowledge sharing.

Section 3: The Project

The practices and processes of the teachers interviewed showed great similarities regarding their use of blended learning as an instructional strategy to improve student performance. Unlike the universal definitions of blended learning, the SJC's model promoted the integration of digital tools in the face-to-face environment but was negligent in using the online environment for teaching and learning. The participants in this study defined blended learning as the combination of face-to-face instruction supported by distributed educational materials using the LMS.

Throughout the interview process, the teachers agreed that the blended learning strategy as implemented at the SJC would be successful and add value to student achievement if the courses were designed and facilitated by adequately trained teachers. The findings showed the teachers perceived blended learning as being able to support student success when teachers have the necessary skills, knowledge, and abilities to use blended learning efficiently. Scott et al. (2017) study findings were consistent with this study, and they recommended that when technological tools are implemented as part of instruction to improve academic performance, teachers will need to know the value of the tool and how it connects to positive learning outcomes and best practices. Scott et al. argued that this knowledge would allow teachers to be better able to assist students in using the various types of technologies.

Although most of the participants valued blended learning as an instructional tool to improve academic performance, they felt that the model institutionalized at the SJC was not as successful as the stakeholders had anticipated. The participants had a firm

belief that if implemented correctly, blended learning would facilitate engagement, collaboration, and student-centered learning to improve student academic performance. These findings were consistent with those of Scott et al. (2017) which explored the possibilities of professional development for university teachers. The teachers at the SJC felt that a mechanism for induction and pretraining should have been put in place for them as well as for the students. The SJC teachers agreed that with the appropriate knowledge they would have been able to provide their students with appropriate content, extensive choices, and better guidance on selection of activities, and students would have been motivated to participate fully.

Several teachers reported that the SJC needs to implement training sessions to help teachers understand how to instruct in a blended learning environment. The teachers confessed to contributing to the "course and a half syndrome" spoken about in the literature review. Some of the teachers indicated that their online components were mere add-ons from their lecture-based course. Similar to this study, Fink (2013) study recommended that teachers engage in professional development programs that will advance their current skills to fit the blended learning initiative.

Rationale

The SJC created a learning environment in which teachers were required to lead the transition to a blended learning model that integrates an LMS with high-quality instruction to drive student performance. When the college embarked on its ambitious blended learning curriculum reform, it quickly became evident that before teaching could begin in the online environment, teachers would require training. The findings of the

current study, revealed that training was also needed to introduce teachers to the pedagogy associated with teaching and learning in a blended environment. Vanderlinde et al. (2014) study found that teachers' changing roles as blended learning teachers required training regarding the use of ICT in their classrooms. This absence of training created challenges for the successful implementation of blended learning to improve student performance. This finding led to a TPD program geared toward finding solutions to these challenges.

Findings from other studies showed that a shared interpretation of the pedagogies that characterize blended learning does not exist among educators (Garrison & Vaughn, 2016; Trowler & Trowel, 2010). According to the teachers interviewed, the lack of understanding of the types of knowledge required to convert to blended learning led to unrealistic expectations among faculty. The teachers reported that their proficiency with computers in their educational practice affected their willingness to use the LMS as a teaching tool. These issues needed addressing if the practices and processes used by the teachers are to reach best practices standards.

According to Koch (2014), there are didactical and technical skills and knowledge that teachers require for blended learning. The teachers in the current study stressed the need to further their knowledge of the Moodle platform and learn the pedagogical approaches for teaching in blended learning classrooms. The teachers called for a better understanding of blended learning components to ensure that they can develop pedagogy and make informed content-delivery decisions. The teachers suggested training to increase their awareness of the e-learning tools and the pedagogical benefits it can bring

to their respective subjects. Scott et al. (2017) suggested teachers need to have the knowledge required to leverage the benefits technology can offer.

The emergence of SJC's blended learning curriculum requires the college to provide professional development to prepare its teachers to use best practices and processes when instructing in a blended learning environment. Findings from the current study indicated a need for teachers to understand the new digital curriculum the college has implemented. Teachers assume many roles, and this type of transformative teaching using ICT can only be effective if teachers understand their roles and the goals of their students in continuous reflective activities (Kimmons, Miller, Amador, Desjardins, & Hall, 2015).

Throughout this study, the teachers reported the need for a professional development program designed for their pedagogical needs. Burns and Lawrie (2015) documented technological changes such as online simulation, blended learning, and gamification as creating a demand for lifelong teacher training. Burns and Lawrie added that the increasing diversity of students at tertiary institutions also warrants continuous training in pedagogy and curriculum development. These required competencies as reported by the interviewees in the current study formed the basis of a TPD program provided for the teachers at SJC. This program will provide opportunities to acquire the skills, knowledge, and ability to create and deliver interactive and engaging content and use blended learning teaching methods effectively (see Koch, 2014).

Findings from the current study indicated training as being the key to bridging the knowledge gap that exists around designing a blended learning curriculum that will

provide students with the opportunity to improve their academic performance. The teachers in this study indicated that with the appropriate training, blending these types of knowledge will enable them to connect the content they wish to teach with the best delivery method in the daily practices. This project offered a solution through the development of a certified TPD program with the aim of creating a cohort of teachers capable of meeting the SJC's blended learning program goals. Pradarelli, Nouet, and Latorre (2017) suggested a teaching sequence that combines presentations, tutorials for self-training, a project to apply the concepts, and the use of tools to allow participants to discuss their learning.

Review of the Literature

In developing this project, I conducted a study of the literature relating to the project offering for professional development geared explicitly toward technology integration. The review delved into existing research on professional development for implementing sustaining blended learning as a strategy for improving student performance. It also provided a narrative account of the use of blended learning for professional development, as well as an exploration of the various best practices for high quality efficient, professional development.

The literature further examined the use of teacher training in integrating technology into the classroom, with a focus on using blended learning. It will reveal the importance of differentiating instruction by using technology to encourage an active professional development program. The review also discussed the critical issues when teachers experience when blending face-to-face interactions and online training.

Search Criteria

The search for this review literature was conducted by searching peer-reviewed articles from various databases such as EBSCOHost, ERIC, and ProQuest. The search criteria used include "teacher professional development" and "technology integration" with an emphasis on blended learning. Google Scholar searches used keywords "adult learning"; "professional development + blended learning"; "train-the-trainer + blended learning" and "instructional designing + blended learning." To ensure that the searches generate current results, "2016" or "2017" was added to the search criteria for teacher professional development through the use of an LMS.

Theoretical Approach

Teacher Professional Development (TPD) activities fall under the sphere of adult learning, framed within the social constructivist theory. While some researchers considered the andragogical framework as an adult learning theory, others see it as a "model of assumptions about learning or a conceptual framework that serves as a basis for an emergent theory" (Knowles, 1989, p. 112). A teacher's experience with TPD can be subjectively from their interactions with other teachers, and as such, the frameworks for this project will underpin constructivism (Merriam, 2009).

Conceptual framework. The conceptual framework for this project encompassed the work of Knowles (1989) andrological model, which emphasized the teaching of adults as being different from teaching children. According to Knowles (1975), a self-directed adult learner takes the initiative to identify their learning needs, articulate their goals, and evaluate their learning outcomes. The self-directed nature of adult learning

formed the basis of the SJC's proposed professional development program in that it learners will experience meaningful learning in a way that informs them (Knowles et al., 2014). Knowles posits that adults would benefit more from learning through practical experiences as it provides immediate value and this is the spirit of training for teachers at the SJC.

Knowles et al., (2014) believed that learners would need to be open to the idea that solving real-world problems will come through education which then responds by allowing the learner to become competent and skilled. The model contained five basic assumptions which form the rationale for this project:

1. adult learners prefer to direct their learning;
2. adult learners have a range of life experiences to be used as learning resources;
3. adult learners' needs are associated with their shifting roles;
4. adult learners tend to be problem-centered; and
5. adult learners are driven by internal more so than the external influences.

From a constructivist viewpoint, there needs to be a supportive and collegial relationship between the instructor and the learners framed by collegiality (Knowles, 1984).

Transformative learning refers to any learning experiences, which causes a change in a person's viewpoint; it focuses on how adults understand their life experiences and how they make sense of them. According to Mezirow (1991) theory, the notion that learning is the progression of establishing a different or revised understanding of the significance of a new experience. Merizow's sees the first stage of transformation

learning as creating a trigger or a disorientating dilemma that points to reflection when the teacher face choices which need resolving. As the teacher begins to weigh the alternatives, this leads to self-examination (stage 2) and a critical assessment of their assumptions about teaching (stage 3).

The teacher enters the next stage when he/she begins to recognize that others have transformed their teaching and now begins to explore their new roles. The next four stages find the teacher exploring the options for change; adopting an action plan that will allow them to gain the requisite knowledge and skills for implementing the new behaviors required and build competence. At stage 10, the teacher to integrate the required changes into his professional life (Merizow, 1991).

Taking adult learners' life experiences into the educational field is beneficial to instruction, for these experiences address the thinking, emotional, and physical characteristics of the student (Mezirow, 2003). This constructive approach relates to the goals of the project as its theoretical base purports that the learner's prior experiences will help shape their learning. Mezirow further stressed the point that the adult students' experiences are useful to the educational arena regarding addressing emotional, cognitive and physical aspects of the learner. Both adult learning theories apply to learning with technology and provide a suitable framework to explore how this professional development project will impact teaching behaviors and practices.

Defining teachers' professional development. The definition of teachers' professional development (TPD) has shifted, not only in its meaning but also in its practice (Stewart, 2014) as 21st-century teaching becomes a more collaborative practice

(Lieberman & Miller, 2014). A common meaning of TPD proposes specific training to advance and enhance teachers' skills and effectiveness (Loughran, 2014). One characteristic of TPD agreed upon revolved around the fact that the training must be continuing, measurable, applicable, appropriate and assessed (Stevenson, Hedberg, O'Sullivan & Howe, 2016).

The idea of TPD is well explained by Bayar (2014) who stated that by participating in professional development, teachers would discover new strategies to create appropriate lessons while developing their strategies to increase student learning outcomes. Bayar agreed that TPD programs should have an environment where participants interact with the learning as well as with the colleagues who may have more knowledge to share. He offered while that is the idea behind TPD programs, a mistake made is that programs are being designed to keep participants passive during the learning process.

Rationale for teacher professional development. If educational institutions are to take full advantage of using blended learning as a strategy for improving student achievement, teacher professional development will be required. Professional development is a pathway to having teachers increase their competencies and skills to deliver higher quality instruction; it should be considered as a process more so than an event (Soine & Lumpe, 2014). The authors found positive effects regarding student achievement because of ongoing TDP programs that align with the teachers' learning needs. The authors specified that students would benefit when teachers change their current practices and beliefs. Their findings suggest that teacher education programs

produce teachers who are likely to behave in ways that will influence student learning and that teachers are likely to change their behavior when confronted with pupils who are not learning.

As with Chang, Shen, and Liu (2014) finding, one may argue that the required competencies for blended learning teachers are those relating to being a "content expertise" or an "instructional designer"; engaging in "learning assessment" and "administrative management" (p. 82). Most researchers see these as essential competencies required of teachers involved in facilitating and developing blended learning courses. These competencies were resembling those highlighted as being required by the teachers in this study. These studies provided strong support that pedagogical preparation of teachers adds value to instruction when measured regarding student academic learning.

With the advent of technology, teaching practices have changed, and if teachers are to remain effective in their teaching practices, they would need to update the knowledge and skills regularly. The importance of teachers having updated skills in classroom delivery and current knowledge regarding their students' needs were stressed in the literature, as a requirement for TPD. As shown in this study, it is common practice for face-to-face teachers to begin developing the online aspect of their course, with little understanding or knowledge of how to design a quality course. The research is especially meaningful as it looked at the development of teachers and highlighted the demands and commitments of the teachers and the effect this training will have on student success.

While TPD appears to be an essential aspect to consider, Meyer (2014) underscored that while the required knowledge and skill sets will take time to master in a TDP program, some skills can be extended through workshops, collaborative discourse, repeated practice, modeling, independent learning or professional development (Stewart, 2014). Professional development will be required if teachers are to learn the new technologies that are required to engage and communicate with students for the 21st century. The rationale for TPD as a solution to improving teachers' blended learning knowledge, skills, and abilities, is not a contemporary notion as this literature reviewed showed.

González-Sanmamed, Muñoz-Carril, and Sangrà (2014) concurred that teachers in the online environment would require skills in the various technologies as well as written communication, and in particular, the management, progress monitoring and report of online students. However, they frowned upon TPD programs for blended learning development that primarily focus on technology but neglects to direct attention to critical competencies such as design and instruction. These are peripheral roles that need consideration when devising an effective TPD program that will direct teachers in the development, design, and facilitation of blended learning courses. Proficiencies in these roles should be targeted with professional development to teachers requiring the associated competencies with these roles (González-Sanmamed et al., 2014). As explained by the authors, the competencies teachers require for online course design and development are more complicated than those required for the traditional classroom.

The professional development received by teachers is a significant feature underwriting continuing success in the classroom. Stewart (2014) suggested that because of continually improving and appraising teacher training, there is a guarantee that the school will demonstrate student success. To accomplish such a feat, learner participation and growth should involve active learning instructional strategies that are engaging, relevant and objective-driven (González-Sanmamed et al., 2014). Several technology-supported classes can be a substitute to the traditional, face-to-face workshop TPD programs.

Types of TPD Programs

Kleber (2015) recommended professional development training for blended learning teachers to help them shift to using this instructional model at their level and with less stress. An ideal TPD model should be aligned with criteria that personalize the program for individuals and recommended opportunities for choice with regards to topics and modalities (Mirriahi & Alonzo, 2015).

Workshop model. According to Gulamhussein (2013), the primary method of delivering a TPD program is the traditional workshop approach which is held once during a school year. Gulamhussein felt that this passive method does not consider the prior knowledge of the teacher and ignore their role as a learner. The author felt that such a TPD program will be more responsive to the teacher's needs and subsequently will create positive changes in teaching practices. To avoid an ineffective TPD program due to a workshop-style approach, Gulamhussein recommended a high-quality program which

addresses the specific needs of the learners, incorporates their diverse learning styles and involves them in the planning, designing and knowledge requirements.

Rigorous studies such as Trust and Horrocks' (2016) and Bayar, (2014) study, have substantiated this impact by suggesting that multiple means of engaging teachers, for example, using face-to-face learning activities and technology are critical elements that shape participation in teachers' development programs. Importantly, adapting these types of interaction among teachers would allow them to gain further knowledge of instructional practices used throughout the school.

Coaching model. Teachers that are newly introduced to blended learning may be able to realize an improvement in their teaching practices and processes through coaching as a form of professional development. Research has shown that this method has significantly improved teaching quality and how teachers approach new types of teaching methodologies. For instance, the International Society for Technology in Education (ISTE, 2015), supported the belief that a successful professional development program should have both social and online elements; and be delivered using a coaching model, to enhance community learning. They highlighted instructional coaching centered on using a practice-based approach for teachers using technology.

Participating in a learning community that relies on coaching will give teachers additional opportunities to incorporate new concepts and ideas into designing their blended learning courses. Martin et al., (2014) also concluded that a successful TPD program would be one that is active, reflective, collaborative, instructive and substantive. By placing the teachers at the SJC in an environment that would allow them to work

together, engage in discussion and examine their practices and processes, will improve their instructional practices and increase student effectiveness (Darling-Hammond, 2010).

Inquiry-based model. Larmer (2014) suggested the project based, challenged-base and problem-based learning that focuses on constructivist pedagogies can be adopted for TPD program with a focus on teaching with ICT. The author's study discovered that when teachers are participants in an ICT inquiry-based training program, they will have first-hand experiences with the pedagogy that they have to use for teaching. As a way of orchestrating this, Larmer held that the best way that a TPD program can motivate teachers would be to adopt ICT pedagogy to engage teachers in authentic activities that do not duplicate their traditional teaching practices. He highlighted the use of authentic tasks as a strategy for promoting learning in the context of reality. Such a strategy Larmer believe will foster learner transfer due to the collaboration that will take place among teachers.

A study introduced by Ertmer et al. (2012) stated that the same technological tools that teachers use in the classroom could be used as part of their professional development program. They offered as an alternative, modeling ICT using TPD, as a dominant mode to facilitate teachers' use of ICT in innovative ways. Modeling difficult tasks or concepts can assist the teacher with a practical understanding as well as a reference point for creating similar activities. Favorable outcomes were noted by Ching and Hursh (2014) when models of exemplary courses were provided regarding the use of the Moodle platform.

The authors noticed that when teachers also accessed their previously developed online course activities that they found it easier to train instructors to use the Moodle LMS. Applying these strategies improved the previously developed courses and related activities in much less time (Ching & Hursh, 2014). Notwithstanding the benefits that are gained using a blended learning approach, Vaughn (2014) stressed the importance of teachers understanding that blended learning is much more than integrating selected technologies into their classrooms. Considering these developments, Rabah (2015), stressed that the teachers would also need the necessary support to effectively practice using new ICT resources, as well as best practices for integrating it into their classrooms.

Blended learning model. Loughran (2014) advised that TPD programs "must be purposefully conceptualized, thoughtfully implemented, and meaningfully employed" (p. 280). There are various types of TPD programs that can be influenced by the ubiquity of the Web 2.0 tools, as pointed out by Beriswill, Huang, Bracey, Sherman-Morris, and Lee (2016), who saw a pressing need to offer teachers professional development relating to pedagogy and content through exploratory centered teaching using technology. Consequently, this will mean developing a well-designed blended learning TPD program would afford teachers with the knowledge to make modifications to their current practices with the support of their peers.

A review of the literature offered the most critical factors for ensuring that a TPD program develops and progress to include reflection and modeling best practices for teaching in a blended learning environment. Powell et al., (2015) cited several other factors such as clear expectations regarding how to use of blended learning in their

classrooms and best practices for balancing instruction in each environment as being necessary for a successful TPD program. Recognizing the benefits that blended learning embraces, the authors further recommended that teachers should be allowed to experience personalized, blended learning themselves. These experiences may lead them to become more aware of how they teach and why changes to their practices and processes may be necessary.

Engaging in a TPD program that mimics the actual teaching environment, is necessary for blended learning teachers and can be used as the impetus to propel them to use similar practices while teaching. Mirriahi and Alonzo (2015) reported on the invaluable contributions of a TPD which embody principles of blended learning by proving that this training method will provide teachers with a chance to gain a better understanding of theoretical and practical applications through hands-on experiences.

To verify the validity of these assumptions, Lee (2014) implemented a model of professional development targeted at improving teachers' instructional practiced and processes. The TPD, which spanned one year with 29 teachers, facilitated an active learning environment, exercising face-to-face workshops, collaborative group work, hands-on activities, problem-solving opportunities, and presentations. Lee found that teachers used the face-to-face sessions to complete workshop activities and problems, while the LMS was used for practice and reflection or peer discussions- findings which were resembling this study. Lee stated that the teachers must be able to communicate and share ideas that are related to their instructional practices related to their face-to-face and online learning activities.

Engaging teachers in TPD through online learning is an important tactic to move their traditional view of teaching from being the expert teacher to learning with and from each other, by engaging in developing teaching activities, resources, and plans tailor-made to their requirements (Kozma & Vota, 2014). With the research so substantive, it is clear that for a TDP program to be useful to the SJC for improving student achievement, the training should include facilitating online discussions and engaging students in reflective and experiential learning (DeMonte, 2013). Such actions will make the learning process more exciting and bring liveliness to the subjects.

In the realm of online discussions, Ioannou, Demetriou, and Mama (2014) agreed faculty should learn how to design structured discussions with appropriate completion guidelines, model quality posts, and engaging commentary, aligned with the student learning outcomes. They felt that is critical that faculty know how to design discussion boards that create high interaction and engagement. However, one must also consider the time and effort of designing and implementing a well-blended TPD program bearing in mind the SJC's constraints.

In addition to reflecting on their pedagogical practices while using technology as part of their learning processes, the teacher can experiment and experience ways that ICT could increase their teaching effectiveness. Rienties, Brouwer, and Lygo-Baker (2013) argued that the use of online training for teachers will allow them to better understand the inter-dependence between pedagogy, the subject content, and technology so that they too, can efficiently teach using technology. It has been shown by Terosky and Heasley (2014)

that a TPD curriculum for e-learning teachers have positive effects on students' academic performance.

Research shows that using technology for teaching will (a) create meaningful hands-on sessions (Rabah, 2015); (b) increase motivation and engagement among learners (Musafina, 2016); (c) allow for mastery of technology skills (Vajravelu & Muhs, 2016); increase learner's academic confidence (Costley, 2014). It would also allow additional time for learners to enhance their ICT skills and subsequently, their educational performance (Nwoobi, Ngozi, Rufina, & Ogbonnaya, 2016). It is evident that the majority of the studies mentioned above have surveyed and approved with the main characteristics necessary for an effective TDP program.

Despite the overwhelming backing in literature for acceptance of a blended learning TDP, there is still a challenge with finding the most effective ways to implement such a program. While this is the case, Prestridge and Tondeur (2015) recommended using ICT as part of TPD to facilitate advanced pedagogical practices. Such a move will provide the teachers with firsthand knowledge that will significantly impact the way technology they use while teaching. The authors summed up TPD as learning that is delivered in such a way, that is impacts on teaching practices that subsequently translates into student learning. Prestridge and Tondeur hoped that this strategy would leverage efforts which will positively affect student educational outcomes. This may mean creating training for teachers' professional practices to move away from using technology superficially or for marginal reasons such as uploading the course syllabus to adding electronic resources such as lecture recording and online assignments.

Conclusion

This review of literature examined the instructional approaches to TPD and the various ways TPD can be implemented at the SJC, considering its unique characteristics as a TVET institution. Underpinning the inference from this literature review is the conclusion that when teachers participate in the learning process, they develop student independence and online self-regulation, which are positive professional development outcomes (Prestridge & Tondeur, 2015).

The results offered in the literature provided supportive evidence that will further inform the designing of the SJC's proposed TPD to meet the faculty needs. The evidence that the literature emphasized regarding the need for a collective inquiry, reflection and collaboration as requirements for a successful TPD program. As recommended by Tyunnikov (2017), the need to provide continuing TPD programs should be a default need by the SJC if they are to provide a valuable education using ICT.

The question that this literature review raised is if a mixture of any of the two models to TDP will be effective or possibly more impactful than what a single model will achieve. For the SJC, the answer will be using a blended learning model, that provides online instructional coaching combined with workshops to facilitate professional development, with the understanding that teacher training must be consistent and supported over time.

Project Description

The research supported the findings of this project study by advocating for specialized training in promoting engagement, interaction, and collaboration in their

blended learning courses. The teachers in this study stressed the need to know how to design activities to support a deeper understanding of the content to make sound decisions regarding synchronous and asynchronous types of technologies (Simonson et al., 2012). Voggt and Tondeur (2015) agreed that teachers have to know their subject matter as well as educational technology if they are to be effective teachers in a blended learning environment.

Most of the teachers mentioned the need to be able to know and understand how to use the LMS to increase student online engagement and build collaboration into their course design. They agreed that most of their courses were not always well organized or structured and suggested that with training, they would be able to divide content into suitable chunks and design the course to be more comfortable to navigate. Grounded on these findings, a professional development program is needed to address the two critical needs of the teachers are SJC; namely the structural issues that reside in the previous unsatisfying training programs and the related issues as a result of the lack of expertise for using best practices and processes for a blended learning curriculum (Elliott & Oliver, 2015).

I am offering a TPD program to the SJC, as the solution to the challenges at the college which will lend itself to improving staff development for a successful blended learning initiative for the next academic year. This proposed professional development opportunity will provide teachers with the required practical and pedagogical skills to develop the blended learning environment to achieve the higher student outcomes. This program aims to up-skill teachers at the technical and vocational college, in best practices

for designing and teaching a blended learning curriculum. The variable knowledge of how to correctly use blended learning as an instructional strategy, along with the dearth of training, were barriers preventing faculty from using best practices while adopting blended learning.

Training based on these competencies will further focus on the social, cognitive and instructional presence of the teachers in the online aspect of the course (Kolb and Kolb, 2005). The teachers also indicated that their lack of training in instructional designing did not allow them to guarantee that their courses were correctly designed to promote engagement, collaboration, and student success. During this program, the participants will cover best practices for designing blended learning content, instruction and assessments, integrating technology into the face-to-face classroom, and the technical skills needed to upload pedagogical sound course material to the LMS. Participants will be able to gain the necessary knowledge, skills, and abilities needed to develop useful print, video and audio materials while collaboratively building effective blended learning experiences. Through reflection, the participants will refine one of their existing courses, to recreate a final model product to be used as an exemplar for their other courses (Kolb & Kolb, 2005).

Target Audience

The instruction will mostly target the learners who have deficiencies in using Moodle advance tools and require the requisite skills and knowledge for instructional designing. Palloff and Pratt (2011) cited instructional design and curriculum development, as being essential for teachers who do not have the understanding to

develop and maintain online courses. It is required that the learners have a basic knowledge of parts of the computer, operating systems, keyboarding skills and are familiar with the internet.

Program Goals

The primary goal of offering this program as a blended course is to provide teachers with a collaborative and social environment, where they would be able to model, real-life experiences and best practices. At the end of this project, the learners would be able to:

1. demonstrate best practices for designing blended learning content, instruction, and assessments to engage and sustain student learning;
2. demonstrate increased knowledge, skills and ability to integrate instructional technology into building lessons designed to promote student success;
3. gain the necessary knowledge, skills, and abilities needed to develop print, video and audio materials to integrate as activities into their curriculum, and
4. apply pedagogical frameworks of blended learning to refine an existing course to be used as an exemplar.

Program Design

This course extends the classroom beyond its physical boundaries using Moodle LMS to supplement traditional face-to-face courses. The training program will be fashioned around theoretical, practical and exercise sessions. The training is to be informed by the following principles:

1. Training is a continuous and progressive process.

2. Training must be relevant.
3. Training must be challenging and interesting.
4. Training must be realistic.
5. Training must have an aim and objectives.
6. Training and training methods must be continuously reviewed for their effectiveness.
7. Training must reflect its operational doctrine (Merizow, 1991).

Collins and Xin (2015) established that the online features along with delivering quality content with relevancy for instructional practices, define the quality of online professional development format. By participating in this program, the teachers will be able to exploit learning with synchronous and asynchronous online tools in a suitable mix. As mature learners, the teachers will participate in collaborative learning experiences that solve real-life problems and allow them to use their experiences to make learning more meaningful and engaging (Knowles, 1980).

The overall intent of this design is to allow the participants to evaluate selected activities with an emphasis on the in-depth understanding of specific concepts. The training process will allow participants to acquire knowledge in the same way that they will be required to teach. Litoiu (2014) confirmed that teachers should experience learning as their students would, and therefore the movement from the face-to-face setting to ICT-supported instruction based on a student-centered approach to learning is necessary for the competency-based institution. Participants will also use the varied

experiences to bring a more extensive knowledge base to the classroom settings (Knowles, 1980).

The program will include units that are relevant to equip the teachers at the college to make better use of instructional technology in their classrooms. By providing many opportunities for human interaction (see Picciano et al., 2014), the sessions will allow the learners to concentration on fewer topics at a time, instead of overwhelming learners with too much new information. A high level of interaction and feedback will be given during the unit so that the learner will gain confidence to work on his or her own to complete the task. It is beneficial to this group of learners to be taught by example while sharing the benefits of different learning approaches (Fitzpatrick, 2012).

Pre-instructional activities will include motivating the learners and gaining their attention; informing the participants of the lesson objectives and then inform the participant of what they need to know to be successful in this lesson (for example, prerequisite skills). Presenting the content will include stimulus material such as a video tutorial, handouts, and step-by-step checklist. The participant will engage in interactive learning by following step-by-step procedures in the video tutorial and the handout. Participation will be gained by giving the participant opportunities for practice (for example, eliciting the performance) and giving the participant feedback during and after his or her practice sessions. Follow-through activities will include memory aids for retention – for example, video tutorials, audio clips, transcripts, checklists, step-by-step handouts and PowerPoint presentations.

As well, activities to help participants transfer their learning to other contexts. The training will be participant-led and therefore must be as interactive as possible. This design allows for teachers, as students, to create practical and applicable work for their curriculum, and work in a blended learning environment that offers instruction with maximum autonomy (Knowles, 1980).

Proposal for Implementation and Timetable

The TPD program implementation schedule is intended to provide flexibility for teachers' commitments and adequate time between face-to-face classes for the practice and completion of assignments. It is necessary to respect the schedules and workload of teachers when planning a TPD program. The course occurs over a two (2) week period with face-to-face sessions held every other day. Participants will use the free day of face-to-face teaching, to complete asynchronous and synchronous learning activities and practical reworking tasks. The time span between each activity will further allow for application and sufficient practice in the teachers' classrooms. The implementation of this project would commence in June, which coincides with the end of the semester when the teachers will be on their non-contact schedule (see Christ & Wang, 2013).

During the interview sessions, the teachers spoke of resenting giving up time during the semester to attend just-in-time training sessions. These issues are relevant to the course design and every effort will be made to ensure that the training is deemed necessary and productive to the teachers so that they can see value in attending the training (Christ & Wang, 2013). Accordingly, the program activities as shown in Table 3

(Appendix A), are designed to be counter-productive so that teachers do not become bored or overwhelmed.

Instructional Plan and Strategies

Adult students demand diverse and varying instructional strategies that maximize learning to reduce resistance to learning in an adult education setting (Litoiu, 2014). These assumptions suggest that there must be detailed procedures in place for the design, delivery, and assessment of adult learning activities. Bayar (2014) conducted a study which derived best practices from Knowles (1980) discussion on adult students, and outlined the following for this TPD program:

1. it must match the existing teachers' needs;
2. it must match the school needs;
3. teachers must be involved in the designing and planning of the activities;
4. active participation opportunities must be provided;
5. training and engagement must be long-term and
6. the instruction must be of high quality (p. 323).

Based on these best practices, facilitators will be encouraged to employ a phased approach to lesson planning and delivery which includes an overview, input, participants' processing and review. The facilitator will share learning intentions and success criteria to ensure that they align with the participant's needs. Active opportunities for participants will include group work and peer assessments to ensure that engagement is long-term, reflective exercises will be used to enable the teachers to evaluate the practices and practices they employed when designing their courses. The facilitator will also provide

the participants with ongoing assessments through reviews and observations to maintain the integrity of the course.

The training is structured to accommodate the various learning styles and different bits of intelligence of the teachers. Various types of Web 2.0 tools and activities are planned to help meet the teachers, varying needs and to enhance their strengths and weaknesses, and therefore activities will range from being easy to difficult but not impossible to accomplish with some help. The goal is to ensure the teachers remain stimulated throughout the training with challenging content, flexible pacing, higher level thinking, and materials appropriate for their learning.

Considering that the teachers are tactile participants, hands-on and practical approaches to learning with quick feedback on progress will be offered. The resource materials will be text-based with info-graphics to make them visually stimulating. Training staff is to document a weekly performance report on each participant. This method will allow the facilitators to observe and subsequently document the improvements and the strength and weakness of each participant's performance. These principles and techniques are the basis of sound instruction. They are guides of which the facilitator must be aware of and apply with commonsense, enthusiasm and imagination.

Instructional Materials

Instruction will be made more effective by the correct use of aids. Their primary function will be to assist in the understanding of the students. Also, realistic instructional aids will be used to add variety and make learning more interesting and relevant. Knowles (1984) suggested that the classroom environment should focus on the characteristics of the

adult participant and therefore the training will employ appropriate instructional materials and strategies in various learning contexts. The self-paced instructional materials to be used will be able to:

1. Explain the concepts listed in the unit.
2. Provide a demonstration – via video – of the concepts to be taught.
3. Provide the participant with practice on the concepts taught.
4. Assess the participant on the concept taught by performance assessment.

The course includes technology training that aligns with the technological resources available to the student. It also incorporates an appropriate and engaging use of multimedia. Handouts will be used to complement the visual instruction and will also provide step by step instructions and screenshots of tasks procedures. Students will also be download content in video, audio and .pdf files to supplement course content – resources will also be provided for the participants in each learning step or activity. Any form of instruction whether it is a lecture, lesson or a discussion, will be designed so that the different phases of instruction are logically presented.

Considering the purpose of a teaching aid is to simplify instruction, it follows that it should be as simple as possible and contains only the essentials. Participants will be provided with opportunities to enter the discussion and blog posts, access emails, download videos and audio clippings as part of their learning process. The primary purpose of the discussion forums will be to provide the student with an explanation of the concepts taught to meet the unit's objectives.

Roles and Responsibilities of Participants and Others

As the course manager, I will be the primary person responsible for the development and implementation of the project by establishing milestones, directing activities for the successful completion of the course. In addition to monitoring the advancement of the training, I will provide the necessary feedback to the facilitators, Subject Matter Experts (SME) and project stakeholders. The SMEs will assist in the designing and development of assessment tasks, support training materials, lesson objectives, pre- and post-test and the instructional plan.

Guest facilitators, who are qualified and trained in facilitating professional development for technology integration, will conduct the workshops. Each facilitator will be responsible for the proper implementation of training, by using the approved training materials and administering appropriate assessments and evaluation checklists. The college administration will provide the location and technical support for the professional development opportunity. The online coursework will be asynchronous, to allow participants to schedule their involvement in the unit over a given week.

Potential Resources and Existing Supports

The scope of work to be accomplished includes providing the human resources; the necessary software and hardware; the designing and programming of the instruction and the testing and correction of any deficiencies therein, for the conversion into a newly designed blended learning course. Existing support and possible resources for the proposed TPD program include the technology devices and equipment already installed in labs at the SJC. The devices include interactive whiteboards and ceiling mounted

projectors in classrooms. The internet, high-speed bandwidth, strategically placed access points to ensure 100% Wi-Fi accessible and at least one Ethernet cable junction box will be required for the training room. Also, teachers should have access to check out other technology devices such as digital cameras and scanners. Further existing support comes from IT team who will manage the schoolwide server. They will also organize, facilitate, and implement technology-related training related to professional development, and technology guest instructors. .

The third layer of support comes from the media resources needed to complement the instructional objectives. To ensure that the instructional media is easy to understand, screenshots and examples of tasks are added throughout the printed handouts. Cues will also be added to direct the participant to follow the best practices. The text will be written in short easy to read paragraphs with steps of the processes in sequential order. Consistent terminology will be used throughout to assist with comprehension. As the participant progresses through the units, they will find references to previously learned information. The information needs to be entered into the computer in a specific order. The step by step processes will instruct the participant in the proper procedures for entering information and generating positive outcomes.

Potential support comes from the instructional team under my leadership as the Coordinator, who is a highly qualified experienced instructional designer and experienced professional development instructor. The three facilitators assigned are also trained and skilled to be technology coaches capable of helping to support initiatives and

integrate practices. The primary focus of the team will be to facilitate best practices for technology integration and support teachers to gain technology proficiencies.

Project Assessment and Evaluation Plan

Assessment Plan

As suggested by Kuo, Walker, Belland, and Schroder (2013) an assessment plan needs to be put in place based on the evaluation goals and criteria identified before the evaluation is conducted. The purpose of formative testing will be to help both participant and facilitator recognize gaps in learning so that remedial action can be introduced to improve retention where learning has occurred. It will also enable the instructor to identify those participants who require remedial training swiftly. The course facilitators will conduct formative examination after each period of instruction as confirmation and at periods during the course as progress tests.

The facilitator must always be aware of how much of his instruction is sinking in, to ensure that the participants are learning. This process is called confirmation, and it ensures that one step or stage in the process of learning is confirmed before another step can be attempted. Confirmation is compulsory at all stages of instruction to make sure or confirm that participants are learning. For instance, at the beginning of the period by revision, if there has been any previous related instruction on the subject, to make sure the class has the knowledge on which new instruction is based and depends. Another aspect of confirmation is that it caters for the facilitator pausing at specified intervals in instruction to allow participants to clear doubts which they may have. At the end of each stage to ensure that participants understand that stage before progressing to the next.

Oral testing, online quizzes and performance tests will allow the participants to clear any doubts or misconceptions, Alternative ways give variety to attend to the various learning styles in the class will include one-on-one revision periods and in-class discussions. Confirmation will provide the participants with an incentive to learn and develops a sense of achievement within them and serves as a break in instruction. Formative examinations will be set and marked by the instructors teaching the subject area and will be conducted in the form of online theory quizzes and practical assessments. Grades are to be recorded by the instructor administering the test. The pass mark for all written progress tests is to be 70%; skills progress tests will be pass/fail on critical actions being correctly carried out. The facilitator will give students having apparent difficulties in any formative test, appropriate one-on-one training.

Evaluation Plan

The evaluation plan will seek to discover if the instructional delivery system will require any further refinements in clarity, efficiency, or motivational impact. The evaluation will determine if the lesson instructions were biased or ambiguous; if the materials were participant appropriate and if they support the attainment of the chosen behavioral objectives. The evaluator will observe the flow of the instruction and focus on issues such as group dynamic and the smoothness of the course of instruction. It is documented that an evaluation process is a means for understanding how something is going or went (Creswell, 2012). As Lodico et al. (2010) explained, the value of completing a project evaluation is to identify and understand the project's successes, failures, and areas for improvement.

Kirkpatrick's (1959) model provided the conceptual framework that assisted in determining what data should be collected for evaluation purposes. The evaluation will also determine if the lesson instructions were biased or ambiguous; if the materials were participant appropriate and if they support the attainment of the chosen behavioral objectives. The facilitator's ability to maintain interest and influence behavior choices beyond the lessons duration will be considered as well.

Reaction level. At the reaction level, the fundamental question that begs an answer is: Were the participants pleased with the program? How did they feel about such things as lessons, the course material, the facilitators, the facilities used for the class and the methodology? This level is the most critical level of evaluation as it will measure the participants' reactions from the beginning to the close of the course. A pre-test will be administered to assess the student's knowledge and skills.

Learning level. The second level of Kirkpatrick's model deals with learning which will quantify the growth in knowledge or competence before and during the course, to determine corrective actions at the end of the program. Formative testing and feedback will take place throughout the course by the facilitators, testing elements of each enabling objective at the end of the period of instruction and by progress tests at intervals throughout the course.

Behavior level. The question posed at this level checks on how the training affected performance and the degree to which teachers change attitudes, improve knowledge, and increase skill as a result of attending the training program. Summative assessments will cover what was taught during the course. Participants will be required

to transfer and implement knowledge through collaboration and apply learning by revising an existing course and facilitating that course to meet best practices for blended learning.

Results level. The results level evaluation focuses on the impact of training on the college. This level of evaluation will be completed by the SJC in the form of an investigation to determine how the training improve participants' work output? The leadership at the institution will be responsible for this type of evaluation. A survey can be conducted with the group of participants to determine if they are applying the training to improve their blended learning teaching processes and practices.

Since the program was based on goals and objectives that are measurable, then my job as the evaluator merely is that of identifying the discrepancies between the performance of the program and the objectives set and making the necessary recommendations to close any gaps. The results evaluation will be of interest to the leaders of the institution as it will give them ways to improve their blended learning program. The reaction, behavior and learning evaluations will allow the training team to evaluate their training.

The pre-test is a way to evaluate the participating teachers' knowledge and consists of items that measure entry behaviors and prerequisite skills. The pre-test is the first defense in assessing the participants' skills to complete the module successfully. They will occur almost immediately after the initial introduction to the course to identify students (1) who already know the unit objectives; (2) who may have "prior knowledge"

deficits, and (3) who are ready for instruction as planned. This way the facilitators will be more readily able to provide guidance accordingly to each group of students.

A post-test will be used to measure the learning that is related to the program and will be administer at the end of each module. The tests will use objectives-related questions to evaluate factual knowledge and will allow students to reflect on their learning and evaluate their personal or academic growth. The evaluation tool to be used will take the form of a Likert scale questionnaire consisting of related statements about the module being evaluated. The respondent will make a personal judgment on each statement, often selecting one response from some degrees of agreement/disagreement.

Project Implications

Based on its strategic goals and its mission, the SJC must continue its curriculum reform process but with some redesigning if it is to ensure quality assurance of the program. Critical to achieving the objectives of their mission statement and strategic plan, the SJC must ensure that the further implementation of blended learning at the school, can bridge the gap that is hindering the program's success. The recommendation from this project provided suggestions for teachers' professional development which will ensure that they remain current in their practices. It is necessary that the institution remain viable and that their clients receive the best learning experiences possible.

It is especially important, now that more people are accessing higher learning at the SJC, accreditation standards should be put in place to provide society with some assurance that the institution is a notable and acceptable one. This is necessary so that this institution can fulfill its mission statement and put into practice, the vision aims, and

objectives that they have set out. I am hoping that the recommendations put forward in this research will enhance the blended-learning program at the institution producing new knowledge and putting it into practice.

The leadership of SJC must be able to be accountable to the institution's mission, values, and principles as well as the public interests (Newman, Couturier, & Scurry, 2004). The authors added that society needs greater skills and knowledge and to improve learning, institutions resembling those in the position of the SJC, need to take responsibility for how their students are learning. Furthermore, the SJC must be able to distinguish itself by developing sturdier differentiated learning program to promote individual student success within the next two years.

The most significant impact of this project for the SJC will be the need to undertake rigorous and regular evaluations of their blended learning program and focus on the impact on participant achievement and personal development. Teachers then use these outcomes to adjust what needs to be adapted to improve the success of the changes being implemented (Dickeson, 2010). The evaluation must be descriptive and summative to provide program decision makers and potential consumers with judgments about the program's worth or merit to determine its adoption, continuation or expansion, or termination (Fitzpatrick et al., 2010).

Section 4: Reflections and Conclusions

Project Strengths and Limitations

Project Strengths

The strength of this project was its development in response to the results of the interviews conducted with the teachers at the SJC. This project addressed the participants' needs, including the deficiencies in clarity, direction, and expectations regarding what constitutes blended learning and best practices for technology integration. This interest-driven project provided an avenue for the improvement of technology integration skills of the teachers and the impetus for continuous technology integration support at the college. Mackay (2015) found that teachers prefer a TPD program that is based on their interests.

The first stage of the TPD program addressed the problem of the teachers' uncertainty of how to use the LMS to promote student achievement and integrate technology in their classrooms. The second stage was intended to reduce the barriers identified by the teachers and increase their instructional design skills and practices. Results from this study may possibly be used to promote learning-centered classroom techniques and strategies that are necessary for the teachers to motivate students to learn and break through the barriers to their learning. This project, which was designed based on the findings and a review of the literature on learning and participant-centered approaches to instruction, may enhance the social constructivist approach to learning that is applied to classroom practices at the SJC.

Project Limitations

There are potential barriers to the implementation of the TPD program. Although attending the TPD program is mandatory, some teachers may work better than others at integrating technology into their curriculum. Another barrier may be scheduling the TPD program throughout the summer. Continuous support from the IT department is crucial to mitigate dissatisfaction related to computer or internet connection issues.

Recommendations for Remediation of Limitations

Information from participants interviewed helped to guide the formulation of a professional development program to educate teachers on Web 2.0 tools and how to integrate these tools into a classroom. The success of the training will be measurable by the degree to which the methods taught are integrated into the live teaching. The third stage of the program included continuous support, modeling, and mentoring to foster best practices of blended learning. Through technology integration practices, training with different programs and devices, mentoring and coaching, and learning about technological advancements in education, teachers should become more effective and efficient in applying technology to their teaching practices and integration in their curriculum.

Brand (1998) recommended that in addition to leadership developing a philosophy to guide the implementation of computer technology in schools, school leaders can further support the professional technology development of teachers by doing the following:

- establishing flexible schedules so teachers can practice what they have learned (or to continue their learning);
- encouraging and facilitating team teaching and peer coaching,
- allowing teachers to visit each other's classrooms to observe computer technology integration, and
- scheduling regular meetings among teachers using technology to plan and evaluate instruction.

Recommendations for Alternative Approaches

An alternative approach to implementing the project is using an entirely face-to-face model over the course of a summer. This program would involve the use of training manuals and workbooks to assist teachers with their tasks. These manuals would be a useful training resource that provides direction and supports the teachers in the blended learning environment. There would also be a need for the SJC to develop a coherent assessment strategy that would allow participants to use a competency-based approach. It may be useful to get a TVET qualified person who has expertise in developing assessment instruments for trade courses that use distance education methods to facilitate a workshop.

The SJC should use consecutive support sessions with individualized technology mentoring, coaching, and support for teachers in their learning environments. Support sessions should focus on reviewing course content and design during the following semester to reevaluate the work that was done by instructors. These sessions must be planned carefully regarding time and location to avoid inconveniences. Because the

project training program would not extend to semesters when the training team could conduct a rigorous evaluation of each module in the course, this first-level review of selected sections would be beneficial in identifying any issues and trends.

The school's administration must provide every opportunity to include faculty in preparation and training. Teachers must be provided with the tools and resources to allow them to extend their knowledge and skills. Knowing what steps are needed to implement the innovation will contribute to successful attempts to implement the change. Teachers will require additional professional development to support the innovation as technology continues to evolve.

Scholarship, Project Development and Evaluation, and Leadership and Change

Jazvac-Martek's (2009) concept of oscillating role identities caused me to reflect on the changing roles I experienced moving from a participant to a scholar and project developer. When I began this research, it was unclear what direction it would take; my personal goal of providing a well-rounded TPD program focused on increasing technology integration came to fruition. The research was especially meaningful as I looked at the daily routines of teachers, the demands, and commitments of blended learning, and the effects these have on student success.

Project Development and Evaluation

Dick and Carey (1990) provided a framework for the systematic design of this project. The following steps were involved:

1. identification of instructional goals,
2. instructional analysis,

3. identification of entry behaviors and participant characteristics,
4. development of performance objectives and test items,
5. determination of an instructional strategy,
6. development of materials,
7. formative evaluation,
8. revision, and
9. summative evaluation.

This process provided me with the opportunities to identify learning and training gaps, develop sound goals and objectives and assess the participants' needs, existing knowledge and any other relevant characteristics to create a design.

The design of the instruction was developed and prepared for implementation. Plans were put in place to evaluate the instruction and the design process. In addition to defining the project concept, estimating and allocating time, effort, resources and costs had to be considered. The building of schedules and milestones for the project had to be considered to keep it moving from beginning to end. Allocating resources, not only regarding equipment and machinery but also regarding people, was also a critical element (Dick & Carey, 1990).

To manage the project's progression, a clear and detailed plan was created. The plan specified the activities to be completed, the order in which they should be done and the people who will work on them. The time each task will take was detailed, ensuring that milestones and status checks were given to provide a clear indicator of when each deliverable should be completed by the time indicated. Including the project stakeholders

throughout the planning stages, assisted in avoiding schedule over-runs for activities that involve reworking. Meetings also involved identifying the resources required for this project and making sure that all team members had the resources they need to complete their tasks.

Monitoring the progress and results of the project is of vital importance as the client must be provided with progress updates, implementation results, milestone achievements, and other meaningful data. To determine the success of this project, smile tests will be done during the last week of each course to measure the effectiveness of the blended learning version of the workshop. Evaluation criteria to measure the changes in participants' behaviors during the online workshop will also occur. Details about the post-mortem debriefings, reports on the lessons learned and the milestones achieved would be provided in the evaluation report.

Leadership and Change

Leadership. The management of the SJC should serve as the leading role models for change by motivating to keep the program efforts for success moving forward. Robust and committed leadership is crucial to successful change (Daft, 2008). Fullan (1996) stated, "we have gone through the phases of the principal 'as administrator' and 'as an instructional leader' to a broader and more fundamental notion of the principal as a change agent" (p. 701). Resilient leadership and management are required to deal with cchange problems and to create potential opportunities to make significant reforms (Fullan, 1996).

What the teachers think, what the teacher believes, what the teacher assumes, all these have powerful implications for the change process for how curriculum policy translates into curriculum practice (Hargreaves, 1989). This implies that teachers are the main determinants as to what extent they will implement educational changes in their teaching practices. The TPD program attempts to articulate the need for training from a pedagogical perspective – for example, while teachers are trained in the use of the LMS, the pedagogical underpinnings for choosing and designing an activity or resource would be applied. The focus here is to ensure that changes are not to merely occur by using technology, but with best practices. Through this TPD program, the teachers' instructional practices and processes will change. The likely impact on this project on social change would have implications at the school and social levels.

Educational changes. The college should experience a more significant buy-in with the move from the traditional-physical instructor-led classroom toward constructivism. According to the teachers interviwed, such changes should include:

1. participants constructing their meaning and understandings of instruction;
2. instructional goals being discussed, and not imposed on teachers and students;
3. a task and content analysis which will focus less on identifying and recommending a single best sequence for learning, but would instead identify several alternatives and
4. an evaluation that would be less criterion-referenced (for instance, the use of portfolio building).

There will be challenges for schools as they continue the process of implementing technology in the classroom. Overcoming these challenges will call for the commitment of the faculty to ensure that their blended learning classes are based on sound instructional design practices. As time goes by, lifelong learning for faculty would become the SJCs central competitive resource.

Social changes. School culture develops as staff members interact with each other, the students, and the community at large. If the staff members are committed to the reform introduced, then the culture will be conducive to change. A collaborative culture will be nurtured at the college whereby the faculty will gain administrative support and become an instructional leadership team to assist other teachers in decision making regarding course design and development. Collaboration must be entrenched in the college's mission as well as its governance; more importantly, it must form part of the culture and structure if it is to be successful. Cohesion within and among the teachers from the various departments will improve institutional effectiveness, create a better service within the organization and generate efficiency (Kezar and Eckel, 2003).

Collaborations would allow teachers to leverage their combined knowledge of business and pedagogy but it will be vital that the communication lines be kept open and feedback will play a significant role in this process. This will enable teachers to give other frameworks and opportunities to participate more cooperatively in the blended learning curriculum reform and thus, enable them to become productive leaders. Fullan (1996) reiterated this relational aspect of schools by contending that the focus of educational change should be on relationships within the school rather than on

management structures and tasks. Schools inevitably change since they are human institutions, and humans are continually changing. I envision the recommendations put forward in my research will promote blended learning for higher learning institutions by creating new knowledge dedicated to the improvement of social and academic conditions which positively impact society when such knowledge into practice.

Reflection on Importance of the Work

The opportunities and challenges that arose by the implementation of blended learning into the Barbadian classroom were explored in a broader social context. I conducted an in-depth analysis as to how these barriers will affect the implementation of blended learning as well as provide solutions and recommendations to overcome these barriers and challenges. I envision that the types of training modules offered as part of the TPD program will promote blended learning at the higher learning institution by creating new, and advance knowledge dedicated to the improvement of social conditions that will positively impact society when this knowledge into practice. As I reflect on the process of completing this project, I can now discuss being a scholar as it speaks to my academic interests and being a practitioner as well as a steward of my discipline.

Analysis of Self as Scholar

Using Richardson's (2006) crucial elements of scholarly inquiry and student learning, I was guided as to what I needed to know, can do as well as how to develop habits of mind that assisted me in the successful completion of my doctoral studies. In the process of completing this project study, I could evaluate my strengths weaknesses, opportunities, and threats as I set about this journey of obtaining my doctorate. As

identified by Robinson, my strengths are my knowledge of the field, my ability to think theoretically and gain practical knowledge systematically. As it stands now, I need to be able to discriminate between knowledge and my personal beliefs. These are my threats and weaknesses, and I could evaluate them during this project study further.

My primary goal now is to achieve professional excellence by applying my learning to specific problems and challenges in my professional practice (Walden University, 2015). I envision that the recommendations put forward in this research will improve the teaching practices and processes of blended learning for higher learning institutions, conditions and impact society positively by putting that knowledge into practice. (Walden University, 2015). I also hope that my research will create new knowledge dedicated to the improvement of social and educational communities.

Analysis of Self as Practitioner

As Golde (2006) suggested, as a steward of the discipline, I must be able to generate new knowledge creatively, critically conserve valuable and useful ideas and responsibly transform those understandings through writing, teaching, and the application. There will be challenges for schools as they continue the process of implementing technology in the classroom. Overcoming these challenges will call for the commitment of the faculty to ensure that their blended learning classes are based on sound instructional design practices. Additionally, there is a shortage of e-tutors along with the training that is required to prepare them for the unique challenges of blended learning.

Since blended learning is essential for the survival of modern-day academia, as a steward of the discipline, I should ensure that Barbadian teachers understand how to compensate for the barriers and challenges as they relate to e-learning, as they determine the way forward in distance learning. This will also mean for me to be able to provide suggestions and solutions for developing pedagogically sound blended learning courses.

Analysis of Self as Project Developer

In my country, there was a challenge for some tertiary institutions as they begin the process of implementing blended learning. Based on personal experiences, there was a definite need for research and a solution related to integrating blended learning. If the future of blended learning is to be successful in Barbados, it is imperative that we fill any gaps with well-qualified and well-trained teachers. By completing this project study, I am now well-equipped to take the necessary measures to bridge these gaps as I now can offer recommendations and solutions for face-to-face instructors as they begin the process of incorporating and integrating technology in the classroom. At the end of the implementation of this project, faculty will be trained in identifying learning and teaching style inventories that would better enable them to instruct using technological applications to enhance their teaching experiences and their participant's learning outcomes.

The implementation of this project is most suitable for educators, participating in a blended learning program as it can be used to create and support ideas on how to foster growth in the pursuit of successful curriculum reform. It is imperative that we understand

the difficulties and challenges that teachers face daily and how these challenges are manifested in and guide their experiences in blended learning.

Implications, Applications, and Directions for Future Research

Implications and Applications

Individual differences about prior experience with IT, prior technology experience, learning confidence, access to a computer and the World Wide Web will affect the rate of learning and should be taken into consideration when devising a blended learning strategy. Continuous ICT skills training is fundamental, and even with a highly qualified and experienced faculty, these skills may fall short. Training should be provided to new faculty members to address their various needs for ICT and e-learning development, including their need for appropriate technological orientation. There should be further professional development opportunities for teachers providing opportunities for e-learning-based skills and knowledge sharing.

Bearing this in mind, training should be provided to faculty to address their varying needs for ICT and blended learning development. The need for appropriate technological orientation to the online platform must be considered for both the student and the teacher, and therefore learning opportunities should be provided for such. It is necessary also to consider how blended learning is introduced, and therefore it should begin with faculty at the low end of the technology continuum, and at the most appropriate time, moving then a step further in such a manner, to build confidence and motivate their use of Web 2. 0 technologies in the classroom.

For blended learning to be successfully implemented and delivered at the SJC, solutions for the barriers above would have to include a sound resource management plan regarding the ICT hardware and software available and required by teachers and students. A robust technology-driven infrastructure with attention to the technologies that will support blended learning is required to address concerns about access to the online platform, server speed, and stability. The availability and presence of a range of skilled faculty in information and communication technology, instructional designing and curriculum design are recommended. The lack of ongoing technical and curriculum design support for participants with limited skills will continue to create a barrier for the successful implementation of blended learning at the SJC.

Directions for Future Research

To continue to develop the knowledge of blended learning in higher education in the Caribbean, research is needed to investigate challenges in moving toward a TVET blended learning institution. The proposed research topic to be considered is: what is the impact of the technology integration on student engagement in the post-secondary classroom. The research questions will be related to the student's level of engagement when technology is integrated into the classroom versus their engagement in the traditional classroom. In so doing, research offering solutions that will assist in the implementation educational reforms such as blended learning and e-Learning will be needed to transform the thinking of policymakers to make more informed decisions. This research is significant as the opportunities and challenges emerging due to the

implementation of blended learning, needed exploring in the context of student engagement.

Research that will offer a range of quantitative strategies and analytical tools can be used to conduct a quasi-experimental study on the relationship between the integration of technology in the classroom and student engagement. The proposed research topic being considered is what impact the integration of technology into the classroom has on student engagement when compared that of a traditional classroom. The research questions will be related to the student's level of engagement when technology is integrated into the classroom versus their engagement in the traditional classroom.

The reasons for this research will be to (a) judge the overall value and merit of the professional development program for the students and the instructors; (b) determine if program goals and objectives were met, and to what extent and (c) compare the levels of students' engagement in the traditional and technology-rich classrooms. This research will be useful to the faculty members as it gives them a better grasp of the effectiveness of integrating technology in the classroom. Overall, the researcher will provide significant stakeholders with solid data on the impact of the TPD, and the part it played in the success or failure of a blended learning classroom.

Conclusion

A significant factor that influenced the teachers' use of technology in the classroom is whether they received the necessary training to increase their computer self-efficacy. Intellectual reluctance and support for change were particularly evident among older faculty, who failed to see the necessity of learning new skills as they approach the

end of their careers. There was also some discussion about a mismatch between the preferred pedagogy and the tools required for blended learning. The faculty was concerned about the standards of instruction concerning being able to deliver the same curriculum as their traditional face-to-face classes and workshops. There were also concerns about finding ways to fit blended learning into their daily coursework.

The implementation of integration of technology into classrooms at the SJC aimed at increasing the overall academic performance of students. Such a phenomenon raised questions as to the processes used to develop a blended learning model that is aptly suited for a technical and vocation tertiary institution, and the steps taken to improve students' levels of performance. Regarding reasons for the failure of proposed changes, Kotter's (1966) model stresses the need for commitment, a sense of urgency, stakeholder engagement, openness, a clear vision, strong communication and leadership and most importantly, having a well-executed plan. The advantage of SJC using this model is its step by step model which will allow leadership to better prepare for the change, and faculty to better accept the change. This model does not focus on the change itself but focuses more on completing the steps in a logical process to effect successful change. This model prepares the faculty before the change or vision is created, therefore leading to a smoother transition to the change.

It is also evident as suggested by Kotter (1996) that this initiative may have fallen short because faculty at SJC lacked interest in the proposed change. Kotter's (1996) model also speaks to communicating "buy-in" which involves keeping communication simple so that the message is easily conveyed and understood. By listening to faculty and

assessing the situation, the leadership would be able to clear the lines of communication, and this will allow for greater participation during the change process. As suggested by Kotter, (1966) this will also address the faculty's anxieties, distrust, and fears.

Using a case study approach this research examined the processes used to achieve the program objectives through the utilization of a blended learning environment. The research provided strong support toward blended learning and its relationship with student performance. Hopefully, the discussion will provide the leaders of similar institutions with a foundation for understanding the processes for effectively implementing technology-rich innovations at in a technical and vocational institution.

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Appendix A: The Project

Course Syllabus

Sam Jack College TPD Program

Integrating Technology into The Classroom

PROGRAM DESCRIPTION

The aim of this Certificate in Integrating Technology in the Classroom is to up-skill teachers at the technical and vocational college in designing and implementing blended learning courses. In this two-module course, participants will cover best practices for course design, online instruction, and online assessments as well as the technical skills needed to create, design and offer online course material with pedagogical features to facilitate student engagement using Moodle. Participants will be able to gain the necessary skills needed to develop useful print, video and audio materials in line with instructional design theories. Teachers will collaboratively build blended learning experiences by reflecting and refining a course to create a model.

PROGRAM GOALS

At the end of this program, the participant should be able to:

1. Apply pedagogical frameworks to create, design and offer online, blended learning material, as a strategy to enhance student performance.
2. Promote creativity and innovation in designing, developing and delivering blended learning courses to promote student engagement.
3. Develop the blended learning pedagogical, technical and skills and knowledge to facilitate progression toward e-tutoring.
4. Use a systematic instructional design to redesign current practices using and implement blended learning experiences to create a student-centered classroom.

5. Demonstrate the ability to use fundamental computer-based technologies effectively to facilitate the instructional design process.
6. Implement diagnostic, formative and summative assessment strategies to evaluate participants at the reaction, learning and behavior levels.

INSTRUCTIONAL METHODS

The course will use participant-centered strategies focused on the application of authentic tasks, individual activities, discussion forums and reflective activities. This course will be a learning community where each member contributes to the group and learns from each other so that development occurs at the level of the individual and the group as well. Learning and teaching strategies include:

- Independent and collaborative study
- Reflective and reflexive activities
- Practice assignments
- Peer support

ASSESSMENT AND EVALUATION

This course uses continuous assessment divided into formative assessment and summative assessment. Formative assessment will rely on the use of a reflective approach to encourage participants to apply prior experiences and knowledge to the understanding of the content and to complete required tasks. A certificate will only be awarded to participants who fulfill the time requirement and obtains 75% or above on the overall final grade. Practice periods and teaching practices will be graded using the following guidelines:

a. **Subject Content**. Assessment of the students' ability to research and have sound knowledge of the subject matter in detail and to submit and deliver clear, relevant and understandable lessons.

b. **Organization and Planning**. The ability to review/research materials for classroom use, developing lesson plans, appropriate visual aids, written instructional materials, tests; and to prepare the learning environment adequately.

c. **Use of Methodologies**. The ability to effectively use the lecture method or the development method; to use proper questioning techniques, to adequately explain and demonstrate a skill, then supervise the student's practice when teaching a skill lesson; to select the most appropriate methodology for the content to be taught.

d. **Communication**. The ability to express oneself effectively through spoken written and non-verbal means, as well as the ability to listen. These abilities can be observed during practical teaching exercises, issuing of instructions, individual and group assignments, critiques of performances by peers; and by the clarity, legibility and grammatical correctness of written assignments/activities.

e. **Class Management**. The ability to work effectively with groups and individual in a training environment; to give /accept constructive criticism/feedback, direction, and guidance; to demonstrate the human relations qualities of fairness, friendliness, firmness, tactfulness and empathy and the ability to manage materials and time allotted for teaching.

COURSE FORMAT

This blended learning course takes place over a period of one (1) week and includes asynchronous and synchronous learning activities with 40% of the instructional content online and 60% face-to-face. The training is divided into two blended learning modules with workshop activities interspersed with practical reworking tasks. Participants will be supported by the facilitator in the role of mentor.

MODULE 1 – INSTRUCTIONAL DESIGNING

MODULE GOALS

The goals of this module are to:

1. Instill in participants, the attitudes, knowledge, and skills required for designing effective instruction for a blended learning environment.
2. Provide participants with the instructional development process to collaboratively design and develop blended learning activities and resources.
3. Explore with participants, ideas for facilitating effective design strategies to enhance application in the classroom.
4. Enable participants to apply principles of good assessment design

UNIT 1: PRINCIPLES OF INSTRUCTIONAL DESIGN

Learning Outcomes

By the end of this unit, the participants will be able to:

1. Examine formal definitions of instructional designing
2. Define critical concepts in instructional designing.
3. Identify theories of learning that support blended learning.
4. Differentiate between face-to-face delivery and blended learning.
5. Use basic instructional design guidelines to engage in authentic instructional design activities for a blended learning environment.
6. Demonstrate a working knowledge of instructional development and design models through class discussion and collaborative activities.

Content:

- Face-to-Face delivery vs. blended learning.
- Best practices for teaching in a blended learning environment.
- Instructional Design Models.

UNIT 2: TEACHING & LEARNING IN A BLENDED LEARNING ENVIRONMENT

Learning Outcomes

By the end of this unit, the participants will be able to:

1. Instruct using different methods in the delivery of blended learning programs.
2. Apply collaborative learning principles to synchronous and asynchronous tools.
3. Identify types of participant support strategies in the delivery of blended learning.
4. Use interactive learning content and instruction that will lead to self-directed learning.
5. Demonstrate the ability to work with a team in an instructional design project.

Content:

- Methods of blended learning delivery
- Synchronous and asynchronous tools and approaches
- Best practices for teaching in a blended learning environment
- Interactive learning content for blended learning

UNIT 3: TECHNOLOGY ENHANCED INSTRUCTION

Learning Outcomes

By the end of this unit, the participants will be able to:

1. Identify best practices for technology-enhanced instruction for a TVET course
2. Discuss strategies for using Web 2.0 technologies to promote student collaboration
3. Create course content that promotes student engagement and achievement
4. Facilitate a blended learning course using appropriate teaching and learning practices.

CONTENT

- Technology-enhanced instruction
- Web 2.0 technologies
- Teaching and learning practices

MODULE 2 – USING THE LMS (MOODLE)

MODULE GOALS

The goals of this module are to:

1. Develop in participants, the skills, knowledge, and attitudes relating to online facilitation.
2. Provide participants with an awareness of and develop skills in the tools available to support online facilitation.
3. Develop knowledge and skills for participants to use in designing online activities using an appropriate combination of technologies.

4. Enable participants to make sound decisions on suitable pedagogies for online/blended learning.

UNIT 4: BUILDING AND MANAGING ONLINE CONTENT

Learning Outcomes:

By the end of this unit, the participants will be able to:

1. Differentiate between resources and activities.
2. Add pedagogical-sound resources and activities to a course shell.
3. Explore Web 2.0 technologies to promote student engagement and collaboration.
4. Build and manage online content.
5. Adhere to copyright procedures and guidelines.

Content

- Moodle resources and activities
- Web 2.0 technologies
- Building and managing online content.
- Copyright procedures and guidelines

UNIT 5: COMMUNICATING AND COLLABORATING ONLINE

Learning Outcomes

By the end of this unit, the participants will be able to:

1. Describe the function of announcements and discussion forums in Moodle
2. Create various types of discussion forums to promote student engagement
3. Integrate synchronous and asynchronous learning activities
4. Use Web 2.0 tools to create a collaborative and interactive environment

Content

- Use the News and Announcements Forums
- Create a class lounge
- Create a General Discussion
- Use the Messaging System

UNIT 6: ONLINE ASSESSMENT & EVALUATION

Learning Outcomes

By the end of this unit, the participants will be able to:

- Develop assessments for blended learning environments
- Create and interactive tests using a variety of Moodle modules
- Provide supportive and corrective feedback
- Monitor participant progress and activity

Content

- Create an Online Text Activities
- Create an Offline Assignment
- Create an online Quiz
- Linking online and offline assignments to the grade book.

END OF SYLLABUS

Implementation Timetable

DATE	LESSON	TIME	FACILITATOR ACTIVITY	PARTICIPANT ACTIVITY	RESOURCES
Monday 4 June 2018	Orientation	09:30-10:00 Classroom	Welcome and Introduction Course Administration	Select course to revamp Develop at least five learning outcomes for the TPD. Complete Pre-Test and submit same	Course Syllabus Handouts Checklists Computer Lab
	UNIT 1: PRINCIPLES OF INSTRUCTIONAL DESIGN	10:00-03:30 Workshop	Demonstrate content related to: Face-to-Face delivery vs. blended learning. Best practices for teaching in a blended learning environment. Instructional Design Models	Evaluate learning resources, material, and activities of an existing course Create a copyright policy acknowledgment Choose an instructional design model/strategy and draft a plan of action for re-designing a course.	
		Online	Facilitate content related to: Design strategies and related tools Applying instructional principles to course design blended learning theories to support TVET courses	Complete learning activities	
Wednesday 6 June 2018	UNIT 2: TEACHING & LEARNING IN A BLENDED LEARNING ENVIRONMENT	09:30-12:00 Classroom	Deliver content related to: Methods of blended learning delivery Synchronous and asynchronous tools and approaches	Participate in individual and group learning relating to the content Create three activities to demonstrate their knowledge and skills	Course Syllabus Handouts Checklists Computer Lab
		01:00-03:30 Workshop	Demonstrate content related to: Types of participant support strategies in the delivery of blended learning Best practices for teaching in a blended learning environment.	Participate in individual and group learning relating to the content Participate in teaching practice	

DATE	LESSON	TIME	FACILITATOR ACTIVITY	PARTICIPANT ACTIVITY	RESOURCES
		Online	Facilitate content related to: Interactive learning content for blended learning Blended learning delivery methods	Upload draft plan of action for re-designing a course. Apply course design principles to review and evaluate existing course learning resources and activities.	
Monday 8 June 2018	UNIT 3: TECHNOLOGY ENHANCED INSTRUCTION	09:30-12:00 Classroom	Deliver content related to: Tools for effective instruction Resources for specific learning tasks Tools and technologies for designing content	Choose a technology and apply it to learning content to enhance instruction. Give a detailed description of its application and its benefits	
		01:00- 03:30 Workshop	Demonstrate content related to: Designing and creating technology-enhanced learning content	Design and create learning content to upload to course shell. Design and create a small group and one a large group activity to upload to course shell.	
		Online	Facilitate content related to: Strategies of collaborative learning Tools and technologies that enhance collaborative learning	Upload learning content. Upload group activities.	
Wednesday 11 June 2018	UNIT 4: BUILDING AND MANAGING ONLINE CONTENT	09:30-12:00 Classroom	Deliver content related to: Copyright procedures and guidelines Synchronous and asynchronous tools Moodle resources and Moodle activities	Participate in individual and group learning relating to the content	Course Syllabus Handouts Checklists Computer Lab
		01:00- 03:30 Workshop	Practice content related to: Synchronous and asynchronous tools Moodle resources and Moodle activities Using sound instructional design principles.	Create a PowerPoint presentation, add a voiceover narration and video and integrate into the Moodle shell.	
		Online	Facilitate content related to:	Retrieve two sources from the Internet	

DATE	LESSON	TIME	FACILITATOR ACTIVITY	PARTICIPANT ACTIVITY	RESOURCES
			Synchronous and asynchronous tools Moodle resources and Moodle activities Course design and management	embed a link in Moodle. Add a syllabus to Moodle course.	
Friday 15 June 2018	UNIT 5: COMMUNICATING AND COLLABORATING ONLINE	09:30-12:00 Classroom	Deliver content related to: Communicating and Collaborating offline and online	Participate in individual and group learning relating to the content	Course Syllabus Handouts Checklists Computer Lab
		01:00-03:30 Workshop	Demonstrate content related to: Using Moodle tools to communicate and collaborate offline and online	Participate in individual and group learning relating to the content Create a "Welcome" announcement in the News Forum. Create a "Class Lounge" forum and post an announcement. Add an online forum	
		Online	Facilitate content related to: Using Moodle tools to communicate and collaborate offline and online	Use an online forum to create a new thread by responding to contributions to engage in further discussions. Start a chat session and chat online with students.	
Friday 15 June 2018	UNIT 6: ONLINE ASSESSMENT & EVALUATION	09:30-12:00 Classroom	Deliver content related to: Types of assessment in blended learning programs. Planning and writing assessments in blended learning programs. Assessment of participant outcomes	Demonstrate skills and knowledge by designing and implementing one authentic assessment for face-to-face and online. Create a quiz with multiple choice, short answer, and true-false questions. Complete learning activity by grading and providing feedback on an assignment.	Course Syllabus Handouts Checklists Computer Lab
		01:00-03:30 Workshop	Demonstrate content related to: Using skills and knowledge to design and	Participate in individual and group learning relating to the content	

DATE	LESSON	TIME	FACILITATOR ACTIVITY	PARTICIPANT ACTIVITY	RESOURCES
			describe authentic assessments.	Create and post a new learning activity as an assignment	
		Online	Facilitate content related to: Interactive assessment content for blended learning Blended learning assessment and evaluation methods Grading attributes connected to blended assignments and activities.	Create a test bank, and a related quiz using test bank questions. Complete an online quiz.	
Monday 18 June 2018	Course Evaluations	09:30-12:00	Evaluate course assessments Conduct a course evaluation	Receive report on performance Receive evaluation of revised course	

Sample Design of Face-to-Face Sessions

Activity
Introduction and Unit Objectives ▪ Introduction of the Unit ▪ Students should be asked to tell what their expectations at that class are. ▪ The facilitator presents the session objectives and outlines critical issues for the session.
Delivery Methods ▪ Focus Activities ▪ All units should start by *brainstorming* on the unit objectives – ask questions, (for example, what do you understand by ***? Is there a difference between *** and ***? What are your views on ***?) **Instruction** ▪ The facilitator/guest lecturer makes a presentation in a lecture by filling in the gaps to the participant's responses.
Learning Activities (Group Work/Case Study /Activity) ▪ Classes will include a mixture of interactive lectures and discussions. Lecture notes will be used as a guide to the lectures and private study. ▪ The facilitator presents a relevant task based on the unit and encourages completion during the session.
Lessons Learnt, Application and Summary ▪ Present the notes ▪ Summarize the key issues in the Unit. ▪ Ask participants to share something that they have learned in this session and how they could apply this new knowledge to their work situation.
Close-out, Upcoming topics/activities ▪ Mentioned what will be covered in the next class ▪ Guide private study and online assignments. ▪ Explain and provide guidance on upcoming assessments (if applicable).

Module 1, PowerPoint Presentation

Reviewing Course Outline to Transform into Blended Learning

Reviewing Course Outline

Common Mistakes

- Objectives are too general and don't include specific information on what the student will be able to do
- Objective are not measurable- objectives don't describe what the student will be able to do
- Too many objectives require low levels of cognition such as "demonstrates understanding," or "identifies"
- Objectives did not include at least one of the verbs in the levels 3-6 of Bloom's Taxonomy

Points to note

- Include a lead-in statement such as, "Upon successful completion of this module, students will be able to...
- List verbs which demonstrate a measurable outcome. Place the verb at the beginning of the objective. Some examples are: define, repeat, list, record, recall, relate, underline, translate, discuss, describe, identify, locate, report, interpret, dramatize, illustrate, schedule, sketch, apply, operate, evaluate, solve, calculate, etc.
- Stress critical thinking activities.

Points to note.

- The assignments must probe different student skill sets.
- Assignments are clearly aligned with course objectives.
- Assignments are spread appropriately across the semester.
- The difficulty of assignments across the semester is appropriate for the course level.
- The workload required by the assignments is appropriate to the credit load for the course.
- The instructions for these assignments are clear.

Linking the objectives to assessment

- Recognize that the verbs you use in the course objectives help to define the ways students can be evaluated.
- Course objectives beginning with "identify" or "recognize" or the like will allow the use of objective (e.g., true-false, multiple choice, fill- in) exams,
- Course objectives beginning with "explain" or "discuss" or the like will require written or oral methods of evaluation.
- Course objectives beginning with “analyze," "apply," "construct," or the like will allow written, oral, or laboratory examinations

Points to consider

- Are the methods of teaching appropriate to the nature of the course, the learning outcomes, the proposed modes of delivery, and the likely student body?
- Is the assessment methodology appropriate?
- In courses with practical, field or work-based components, is the assessment activity realistic and relevant to industry practice?
- Does the instructor/student have appropriate and sufficient resources, equipment and facilities to deliver the course adequately?

Wrapping Up

- Course objectives should reflect the purpose of the course as stated in the course description
- Course outline should cover all the objectives
- Methods of evaluation should match the objectives and show how students will demonstrate that all the objectives have been met
- Methods of instruction should show how the course will enable students to achieve the objectives
- Grading rubrics should detail the criteria for receiving course points.

Thank You

Module 2, PowerPoint Presentation

Models of Blended Learning; Design Principles and Planning Tools

Models of Blended Learning

Design Principles & Planning Tools

Learning Objectives

- **What is Blended Learning?**
  - definitions
  - characteristics and design principles
  - BL models
- **Planning tools**

Reflection

1. Why are you considering a blended approach to course design and delivery?
   - What are you trying to achieve?
2. What do you understand by the term '*blended learning*'?

Blended Learning - definitions

- "the thoughtful integration of classroom face-to-face learning experiences with online learning experiences" (Garrison & Kanuka, 2004)
- "a pedagogical approach that combines the effectiveness & socialization opportunities of the classroom with the technologically enhanced active learning possibilities of the online environment" (Dziuban, Hartman & Moskal, 2004)

Blended Learning:
An innovative approach to teaching that incorporates designing and customizing digital technology with personalized learning to accelerate achievement for all students.

Reflection

1. **What are the objectives and targeted learning outcomes for the course that you are currently leading?**
   - How has the course worked to date?
   - Strengths & weaknesses of the current design?
   - Opportunities to 'design in' student activity
2. **How might the introduction of online activity address student learning and engagement with the targeted learning outcomes?**
   - What are the implications for the way that course is designed and delivered (i.e. impact on teaching & learning relationship)?

Course Review Checklist
Guidelines for evaluating course to be revised

Item	√
✓ Actively interact and engage participants in the same way as a face-to-face classroom using synchronous and asynchronous activities. For example: o Discussions, Forums o Blogs o Journals o Group work (small and large)	
✓ Ensure that there is interaction, and thus create a supportive online course community o teacher to student, o student to student o student to resources	
✓ Ensure that your course meets the needs of the participants with the different learning styles o Visual (pictures; visual aids such as videos, animations, power points, diagrams) o Auditory (lectures, discussions) o Kinesthetic/Tactile (moving, touching, and doing)	
✓ Guide participants through the course material using appropriate links.	

Item	√
✓ Provide content resources and links that are easy to access and make resources current and relevant.	
✓ Provide a set of expectations for how students communicate with you with each other and other faculty members online. For example: o How many hours they should be working online (weekly) o Netiquette for online users o What hours the facilitator is available for online (weekly). This would include the time for any synchronous activities	
✓ Ask for formal and informal feedback on the course (early in the course) and also at the end (evaluation).	
✓ Focus on content resources, applications and links to current events and examples that are easily accessible from participant's computers.	
✓ Use discussion forums, journals, emails, etc. to engage the participants in clarifying and broaden their ideas about what they are studying.	
✓ Provide a good closing experience for your participants. Remind them of assignments due, examination (where necessary). Provide them with an opportunity for reflection.	

Instructions for Grading Online Discussion

Discussions will offer you an chance to interact with other students as you share thoughts and points of view about the weekly topics as well as your educational experiences in general. Feel free to pose an alternative idea or present a contrasting viewpoint.

Each discussion will consist of the following elements:

- Preliminary information to be considered before making your initial discussion posting
- A discussion activity, in which you are asked to interact with the members of your cohort group to brainstorm ideas, practice using new skills and strategies, and begin applying your knowledge.

For the online discussion, you will be directed to:

- ✓ **Post** your thoughts/insights/ideas for your colleagues to consider
- ✓ **Read** a sampling of your colleagues' posts
- ✓ **Respond** to a selected number of posts
- ✓ **Return** in a few days to read your colleagues' replies to your original posting and reflect on what you learned and any insights you gained

By Wednesday: **Post** a response to the discussion topic. Use the information in the course textbook for this topic as an additional resource.

By Sunday: **Read** through the postings of your colleagues, focusing mainly on those to which you can add relevant or insightful comments to develop the Discussion. **Respond** to at least **two** of other postings.

Return to the Discussion in a few days to read the responses to your initial posting. Continue the dialog as desired by responding to your colleagues' thoughts.

Discussions are worth ten points each and must reflect:

Contribution to the Learning Community: The student's contribution satisfactorily meets the assigned criteria for contributions to the discussions. The student interacts frequently and encourages others in the community.

Initial Posting: · Relates to the assigned discussion topic with satisfactory evidence of critical thinking. Summarizes and supports content using information from required readings and course materials.

Responses: Provide constructive and supportive feedback to colleagues. · Refer to sources from required readings and course materials. Demonstrate satisfactory evidence of personal learning as a result of interaction with colleagues.

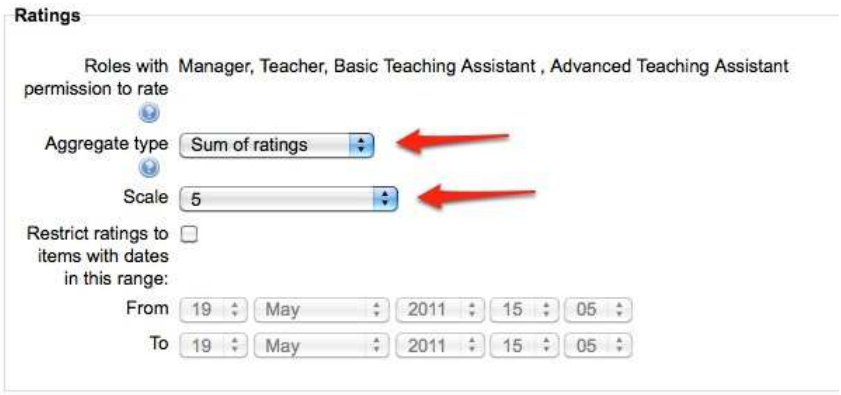
Expression: · Provides clear opinions and ideas written in Standard Edited English.

Process for Grading Online Discussions

Moodle allows users to create discussion forums and rate the posts submitted by students and use them for grades.

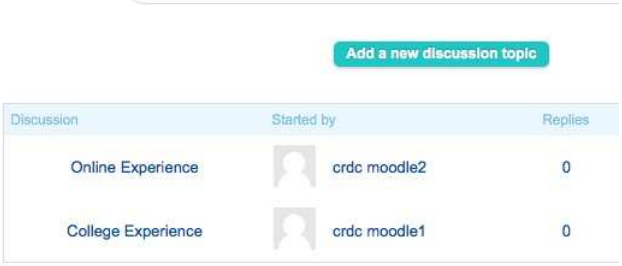
1. Begin by entering the forum where you wish to rate posts.

You should have already created a forum and enabled rating within the forum. If you have not enabled Ratings within the forum, choose Edit settings from under Forum Administration in the Settings column. Scroll to the Ratings section and choose an aggregate type. Then choose a scale to rate your students with.



Save and Display when you are done. Ratings are now enabled.

2. Click on a student post you would like to read and then rate within the forum.



3. Rate the post using the drop-down menu

When you click on a student post, it appears in the window before you. If you can rate a post, then the drop-down menu will be at the bottom of the post along with the rating method.

Once you choose a rating, you can navigate away from the post, and the rating will be saved within the grade book.

Ratings can be changed by following steps 2 and 3 again. The changed rating will also take effect in the grade book.

Pre/Post Test Evaluation

Self -Evaluation Questionnaires for Teachers

Instructions: Please complete the questions as thoroughly as possible by ticking the appropriate box or giving your free response where appropriate.

Personal Data

1. Sex Male □ Female □
2. Teaching Status Full time □ Part time □
3. Subject/s taught

_____

Professional Development

4. Please give details of the training which you have completed in preparation for participation in the blended learning program.

_____

_____

_____

_____

_____

5. Do you think that you have all the skills required to manage your courses in a blended learning environment? YES □ NO □_____
   a. If not, what training do you require to facilitate your functioning as an effective blended learning instructor?

6. _____

_____

_____

_____

_____

Please indicate your level of knowledge to the following in relation to your instructional design and teaching strategies.

Instructional design and teaching strategies	**None**	**Low**	**High**
Designing learning materials for blended learning courses			
Managing assignments using computer software			
Developing audiovisual materials e.g. narrated PowerPoints,			
Developing and, or designing web pages			
Use of chat or instant messaging facilities			
Developing and, or designing graphics using computer software			
Record keeping utilizing computer software			
Developing media using computer software, e.g. audio and video clips			
Handling assignments using ICT			
Tutoring using computer programs, e.g. Learning Management Systems			
Use of email for student-teach communication			
Use of online synchronous discussion groups			
If other, please state:			

7. Using the table below, indicate your level of knowledge of the course design for blended learning.

Comment	None	Low	High
Developing and/or designing course materials in an attractive and professional manner.			
Developing and/or designing course materials which are self-explanatory and easy to follow.			
Organizing and sequencing course materials in a logical and paced fashion for both environments.			
Developing and/or designing course content that are consistent with the stated objectives of the BL program			
Developing and/or designing course materials that support good student-tutor interaction, engagement and collaboration.			

Module Evaluation

INSTRUCTIONS: Select the level which is most appropriate for your current knowledge based on the description given.

Use a √ in the box to correspond with (1) being Strongly Agree; (2) Agree; (3) Unsure; (4) Disagree and (5) Strongly Agree.

Description.	1	2	3	4	5
1. The unit objectives were clear to me.					
2. The unit activities motivated my learning.					
3. The multimedia enhanced my learning.					
4. I was given sufficient practice and feedback.					
5. The level of difficulty of the work was suitable					
6. The pace of this unit was suitable for me.					
7. The instructions were clear and easy to follow.					
8. The content was clearly stated and I understood what was taught.					
9. My understanding of the subject matter improved as a result of this course.					
10. I will be able to use the information in my profession.					

Description.	1	2	3	4	5
11. The instruction enabled me to realize the importance of knowing pedagogy in designing blended courses					
12. The instructor provided constructive feedback on assignments and activities.					
13. The instructor was well informed on the subject.					
14. The unit was well organized and had a great presentation style.					
15. I will be able to use this new knowledge in my personal, educational and/or work life.					

Course Evaluation

INSTRUCTIONS: Select the level which is most appropriate for the criteria met to evaluate the performance of this instructional plan.

Introduction to topics

1. The instructor aroused the interest of the students.

1. Strongly Agree 2. Agree 3. Neither agree nor Disagree 4. Disagree 5. Strongly Agree

2. The instructor adequately demonstrated expertise in the topic.

1. Strongly Agree 2. Agree 3. Neither agree nor Disagree 4. Disagree 5. Strongly Agree

3. The instructor used the introductions to help students understand the background and knowledge that they bring to the class.

1. Strongly Agree 2. Agree 3. Neither agree nor Disagree 4. Disagree 5. Strongly Agree

Questioning techniques

4. The instructor distributed questions to different students.

1. Strongly Agree 2. Agree 3. Neither agree nor Disagree 4. Disagree 5. Strongly Agree

5. The instructor used questions of different types.

1. Strongly Agree 2. Agree 3. Neither agree nor Disagree 4. Disagree 5. Strongly Agree

6. The instructor used follow up questions to get deeper into student responses.

1. Strongly Agree 2. Agree 3. Neither agree nor Disagree 4. Disagree 5. Strongly Agree

Responses to students

7. The instructor expressed sincere interest in the needs of the students.

1. Strongly Agree 2. Agree 3. Neither agree nor Disagree 4. Disagree 5. Strongly Agree

8. The instructor responded to student requests in a timely way.

1. Strongly Agree 2. Agree 3. Neither agree nor Disagree 4. Disagree 5. Strongly Agree

9. The instructor thanked and congratulated students on good performance.

1. Strongly Agree 2. Agree 3. Neither agree nor Disagree 4. Disagree 5. Strongly Agree

Pacing of the course

10. The pace was appropriate for the average class member.

1. Strongly Agree 2. Agree 3. Neither agree nor Disagree 4. Disagree 5. Strongly Agree

11. The pace left some students behind.

1. Strongly Agree 2. Agree 3. Neither agree nor Disagree 4. Disagree 5. Strongly Agree

12. The pace was excessively slow down the more advanced students.

1. Strongly Agree 2. Agree 3. Neither agree nor Disagree 4. Disagree 5. Strongly Agree

Interest

13. The instructor-maintained student interest by varying presentation/activity type.

1. Strongly Agree 2. Agree 3. Neither agree nor Disagree 4. Disagree 5. Strongly Agree

14. The instructor involved the students in two-way communication with the instructor or with other students.

1. Strongly Agree 2. Agree 3. Neither agree nor Disagree 4. Disagree 5. Strongly Agree

Media

15. The instructor used media to emphasize important concepts.

1. Strongly Agree 2. Agree 3. Neither agree nor Disagree 4. Disagree 5. Strongly Agree

16. The instructor used appropriate media.

1. Strongly Agree 2. Agree 3. Neither agree nor Disagree 4. Disagree 5. Strongly Agree

Learning Objectives

17. The instructor made explicit the learning objectives early in the course.

1. Strongly Agree 2. Agree 3. Neither agree nor Disagree 4. Disagree 5. Strongly Agree

18. The instructor measured the achievement of learning objectives.

1. Strongly Agree 2. Agree 3. Neither agree nor Disagree 4. Disagree 5. Strongly Agree

19. The students achieved the learning objectives of this session/class.

1. Strongly Agree 2. Agree 3. Neither agree nor Disagree 4. Disagree 5. Strongly Agree

20. The instructor identified students that need more assistance to achieve the learning objectives.

1. Strongly Agree 2. Agree 3. Neither agree nor Disagree 4. Disagree 5. Strongly Agree

21. The instructor referred students to further learning resources.

1. Strongly Agree 2. Agree 3. Neither agree nor Disagree 4. Disagree 5. Strongly Agree

Continual Improvement

Do any of the answers to the questions above show an area that the instructor would want to improve in?

Appendix B – The Study

Consent to Conduct Study

[redacted]

Debra Marshall-Stuart
Welchtown
St. Peter

Dear Captain Marshall-Stuart

Based on my review of your research proposal, I permit you to conduct the study entitled "Using Blended Learning as an Instructional Strategy to Improve Academic Performance" within [redacted]

As part of this study, I authorize you to:

1. Recruit and contact teachers who used blended learning as a strategy to increase student performance, from within each of the eight divisions at a date and time convenient for you.
2. Have access to public documents (Ministry of Education White Papers, College's Blended Learning Policy, News Articles), and school reports (Evaluation Reports on Moodle Implementation, Graduation Reports, Principal's Report) that will be necessary for the successful completion of the study.
3. Have access to existing data from division heads (Evaluation Reports on Teachers' Use of Blended Learning) to identify those teachers who fully used blended learning
4. Conduct interviews on the premises to secure teachers' initial enrollment in the study and then to confirm their final participation.
5. Conduct follow-up meetings with participants to review interview transcripts and perform member-check.
6. Disseminate the study's results to participants and stakeholders.

We understand that our organization's responsibilities include providing access to the teachers, materials and resources as outlined above. We reserve the right to withdraw from the study at any time if our circumstances change. Individuals' participation will be voluntary and at their discretion.

I understand that the teachers and the researcher will not be naming our organization in the doctoral project report that is published in Proquest. The institution and the teachers will be identified using pseudonyms and numeric codes.

I confirm that I am authorized to approve research in this setting and that this plan complies with the organization's policies. I understand that the data collected will remain entirely confidential and may not be provided to anyone outside of the student's supervising faculty/staff without permission from the Walden University IRB.

Sincerely,

[redacted]

Interview Request Email

Dear Prospective Participant

You are being invited to take part in this research study on the implementation of blended learning as a strategy to improve student engagement and academic performance. I am inviting you as an instructor who took part in the implementation of blended learning at your institution to be interviewed for this study. I purposefully selected you based on the fact that you played a pivotal role in the implementation of the pilot study.

This study is being conducted as part of my doctoral studies at Walden University. You might already know me as a former instructor at the institution, but this study is separate from that role and will by no means affect the outcomes of this research. The purpose of this study is to examine the processes and practices used by instructors at the institution, to influence student academic performance and achievement through the implementation of blended learning. The study will explore how instructors at the institution used blended learning to influence their teaching processes and practices to assist students in improving collaboration, communication, and motivation to achieve successful academic performance.

Your interview will focus on:

- the strategies you used to blend face-to-face teaching with online learning;
- the challenges you encountered which may have hamper student performance;
- the processes and practices you used to increase student motivation, engagement and performance and
- your perception of the outcomes of the blended learning program and its role in student achievement.

If you approve to be in this study, you will be asked to be interviewed for approximately two hours. You may be interviewed a second time to confirm your transcript and ensure that your

responses represent your intent. Your participation will not extend beyond one monthly visit over a three-month period. The interviews will be recorded. All personal references and identifying information will be eliminated when these recordings are transcribed (IRB, 2018).

This study is voluntary, and you can free to accept or turn down the invitation. No one at the institution will treat you differently if you decide not to be in the study. If you decide to be in the study now, you can still change your mind at a later date. You may stop participating in the study at any time. Discontinuing will not negatively impact your relationship with me. A total of eight instructors will be accepted across the academic divisions to ensure equal representation for the institution. To ensure equal representation, if you accept this invitation, please respond to the following questions as part of your acceptance to participate in this study.

1. I used Moodle collaborative tools such as the discussion forums and/or online chats.

   (1) All the time (2) Sometimes (3) Never

2. I used Moodle assessment tools such as quizzes and assignments.

   (1) All the time (2) Sometimes (3) Never

3. I used Moodle evaluation tools such as the Gradebook and activity reports.

   (1) All the time (2) Sometimes (3) Never

4. I work full-time in the following department (circle one):

   Agriculture, Building Trades, General Studies, Human Ecology, Business Studies, Electrical Engineering, Automotive & Welding or Mechanical Engineering Division.

Thank you for your attention in this matter. I do look forward to working to your support.

Interview Protocol

Opening	Welcome XXXXX and thank you for your participation today. My name is Dreana Marshall-Stuart, and I am a doctoral student at Walden University conducting my Project Study. Thank you for participating in this interview which will take about 1 ½ hours. and will include ten questions regarding your practices and processes using blended learning as an instructional strategy to improve academic performance. I consider you the expert at your work so there are no wrong answers to any of our questions. Please feel free, to be honest, and critical even if the way your work gets done is not the way it should be done –everything you tell us is strictly confidential. I would like to have your permission to tape record this interview, so I may accurately document the information you convey. If at any time during the interview you wish to discontinue the use of the recorder or the interview itself, please feel free to let me know. As indicated on the interview sheet, your responses will be kept confidential and will only be used to develop a better understanding of how the practices and processes used by teachers, impacted student learning and performance using blended learning.

	At this time, I would like to remind you of your written consent to participate in this study. You and I have both signed and dated the copy of the interview sheet, certifying that we agree to continue this interview. You will receive one copy. Your participation in is completely voluntary and if you need to stop or take a break, please let me know. You may also withdraw participation at any time without consequence. Do you have any questions or concerns before we begin? Then with your permission, we will begin the interview.
Interview starts	Demographic questions **Question 1:** How long have you been a teacher at the college? **Question 2:** What subject area(s) do you teach? **Question 3:** How long have you been using blended learning at the college? **Question 4:** Did you receive training for the implementation of blended learning?
Interview Session	**RQ 1:** What are the processes and practices incorporated into the blended learning classroom by the instructors at a technical and vocational institution in Barbados?
	Question 1: The institution introduced blended learning as a strategy to increase student achievement. Based on your years of experience teaching in a face-to-face environment - what are the major differences (if any) experienced in terms of students' academic achievement between the traditional and blended learning environments?

	Question 2: Consider your experiences in teaching in a blended learning environment - what challenges did you encounter which you believe may have hampered student performance and achievement? **Question 3:** Based on the types of activities and resources that are offered in the LMS (Moodle) - what do you consider to be the most impactful uses of blended learning as a strategy for improving student engagement and achievement? **Question 4:** Following up on your responses to the above question, how did you incorporate technology with your face-to-face instruction to sustain student learning outcomes and achievements? **Probe**: What resources did you use to infuse blended learning strategies across the curriculum? **Question 5:** Please describe how the implementation of blended learning cultivated an environment that delivered higher interaction and collaboration between you and your students. **Probe**: In utilizing the integrated curriculum, how did you monitor student learning?
RQ 2: What are the processes and practices of faculty in a blended learning classroom at a technical and vocational institution in Barbados, which seemed to enhance student learning?	
	Question 6: In your opinion, how do you think the processes and practices you used in your blended learning courses affect student performance? **Probe**: What teaching strategies did you use to integrate blended learning across your curriculum?

	Question 7: What roles did you play during the process of moving from traditional types of teaching and learning to blended learning instruction and assessment? **Question 8:** What are your perceptions of the blended learning program as implemented at a technical and vocational institution? **Probe**: Describe any influences your use of blended learning had on student performance in terms of the technical and/or vocational subject areas you taught? **Question 9**: What are the processes and practices you implemented in your blended learning environment, to positively affect student performance? **Probe**: What suggestions would you recommend for improving the program to achieve its objectives? **Question 10:** Describe the support systems in place for infusing blended learning throughout the curriculum. **Probe**: What types of support systems do you think you will require in order to use best practices and processes for improving student performance in blended learning instruction?
Interview End	**Question 1:** Is there anything else regarding use of resources in preparing or conducting your courses that you would like to add? **Question 2:** Would you be willing to be contacted with follow up questions? **Question 3:** Would you be willing to be contacted about providing feedback on the data analysis?

Post Interview Comments and/or Observations	Thank you for participating in the interview. Please feel free to contact me with any further questions. *In this part of the interview, I will take a moment to:* • *reflect on any observations;* • *clarify on other parts of the processes that are unclear;* • *ask questions were there instances where I did not ask because it would have adversely interrupted the teacher* After the interview and observation session, I will enter notes of my impressions and other interesting things I would like to share with the Data Analysis.

Theme Table

Table 3

Coding and Themes Table

Themes	Codes
Pedagogical challenges	Instructional issues regarding designing appropriate content for the online environment
	Design issues relating to matching the student's learning goals in both environments
	Creating follow up materials to monitor student performance in both environments
	Selecting appropriate types of tools to regulate online learning
	Students were not as ready to use computers for learning
	Students were not oriented adequately to work in a blended learning environment
	Designing online forums that promoted interaction and encouraged students to contribute
Technical challenges	Systemic technical glitches
	Gaining access to online resources at the college
	Usability challenges
	Inadequate training
	Limited resources due to the demand for devices

	Poor network infrastructure
	Access to adequate internet access
Student	Connectedness that students feel with the teacher
engagement	Active participation of members in the classroom
	Peer-to-Peer collaboration
	Teacher-to-student collaboration
	Organization on activities to promote collaboration
	Resources for students to engaging with each other
	Students' ability to navigate through the online content and use the support materials
Professional	Lack of knowledge in instructional designing of courses
development	Changing roles and teaching styles of teachers
	Lack of knowledge in designing engaging tasks
	Lack of knowledge course facilitation strategies
	Opportunities to allow teachers to collaborate and develop a better blended learning curriculum
	Supporting groups of teachers who can learn from one another
	Guidance of an instructional designer and a curriculum development specialist
	Training in best practices

Student success	Types of learning activities to promote critical thinking
	Compatibility to the program's objectives
	Capabilities of teachers to employ various strategies
	Support to students that were struggling
	Help students practice and reinforce the course concepts
	Complete real-life practical projects and assessments
	Online material to prepare students for their practical assignments