UNIVERSITY OF CAPE COAST

THE IMPACT OF BLENDED LEARNING ON STUDENTS USING IBOX PLATFORM: EVIDENCE OF ADU GYAMFI SENIOR HIGH SCHOOL

FRANCISCA APPIAH

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BY

FRANCISCA APPIAH

Dissertation submitted to the College of Distance Education, University of Cape Coast, in partial fulfilment of the requirements for the award of Master of Education degree in Information Technology

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DECLARATION

Candidate's Declaration

I hereby declare that this dissertation is the result of my own original research and that no part of it has been presented for another degree in this university or elsewhere.

Candidate's Signature …….. Date ……

Name: Francisca Appiah

Supervisor's Declaration

I hereby declare that the preparation and presentation of the dissertation were supervised in accordance with the guidelines on supervision of dissertation laid down by the University of Cape Coast.

Supervisor's Signature ……. Date …….

Name: Dr. Valentina Arkorful

ABSTRACT

The study investigated the impact of blended learning on students using IBOX platform. A blended learning environment was designed to provide opportunity for integrating the learning management system "moodle" with face-to-face classroom interaction. 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. The study was underpinned by social constructivist framework. Data collection involved semi-structured interviews with ten senior high school teachers. The findings revealed that the use of blended learning technology approaches in teaching increased students' performance. It was recommended that training should be provided to teachers to address their varying needs on blended learning development. Teachers need for appropriate technological orientation to the IBOX platform must be considered for both students and teachers.

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DEDICATION

To my dear parents Francis Appiah and Mary Appiah, my siblings, and my dear husband William Opare.

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CHAPTER ONE

INTRODUCTION

Background to the Study

Recent technological tools for teaching breakthroughs have led to improvements in almost all educational practices. Such breakthroughs have helped teachers to develop their pedagogical practices for teaching (Collis, 2013). According to Collis (2013), further developments in pedagogical practices have led to the emergence of the concept of "blended learning" which mixes traditional and electronic learning.

Blended learning pedagogies have been recognised as a path to improve teacher's instructional strategies for teaching using technology (Poon, 2013). Blended learning is perceived to have many advantages for teachers and students including anytime learning, anywhere access, self-paced learning, enquiry led learning and collaborative learning (Ruiz, Mintzer & Leipzig, 2006). This is helping institutions to create desired instructional skills such as critical thinking in the process of learning (Hayfa & Othaman, 2014). Blended learning as an approach to learning has gained momentum because of its widespread integration in educational organizations (Rovai, Baker & Ponton, 2013).

Blended learning is a pedagogical method that combines the social, cognitive and teaching opportunities of the face-to-face classroom with the online environment (Bonk & Graham, 2016; Wallace, 2014). According to Garrison and Kanuka (2004), blended learning is a learner centered approach where students interact with teachers and content through a thoughtful

integration of traditional learning with online learning based on technologies, pedagogies and content.

In a similar vein, Kuo, Belland, Schroder and Walker (2014) reveal that using technology in learning is an approach that combines face-to-face interactions with technology-based learning. Utilization of technology in learning has proven to enhance and increase the effectiveness and efficiency of teaching and learning in both instructional and training environments (Condie & Livingston, 2017). It adopts multiple learning methods and combines both traditional and online learning activities. Dziuban (2014) suggested that for learning to occur, it must use the online component to reduce the amount of time spent on face-to-face or in traditional classroom learning that is, to reduce the amount of time in the classroom.

Thus, blended learning allows the integration of technology in teaching (Pankin, Roberts & Savio, 2012). In using technology in blended learning, teachers can combine both synchronous and asynchronous methodologies, such as face-to-face learning and technology-based methodologies (Glazer, 2011). In turn, Horn and Staker (2011) explains that, in using technology in teaching students can learn at any time away from home and at least in part through online delivery with some element of student control over time, place, path and/or pace.

In turn, Waston (2011) define blended learning is a formal education program in which student learns at least in part through online delivery of content and instruction. According to Watson (2011), the students have control over the time to study. As students get this opportunity to learn anywhere and at any time, there is a likelihood that their academic performance will

improve. This is because the blended learning approach takes care of the learner readiness which is vital to learner performance. In a similar vein, Condie and Livingston (2017) reveal that the use of blended learning makes room for remedial lessons and collaborative learning opportunities for students.

The use of technology in teaching has help teachers to meet the individual learning needs and learning styles of students (Voci & Young, 2011). According to Collis (2013), the uses of technology for teaching have increased students' access and convenience to instructional materials. The use of technology in teaching enables students to learn independently and be in control of the learning process coupled with facilitating cooperative learning (Dziuban, 2014).

Various delivery modes of instructional materials such as a mix of direct lecturing, online communication, self-learning activities, electronic performance support system and learning management systems are utilized in blended learning (Kirkley & Kirkley, 2006). According to Kirkley and Kirkley (2006), the components of technology for instructional approach include face-to-face classroom interactions between teachers and students, using traditional learning materials such as printed textbooks, workbooks and e-learning environment to provide assessment and feedback.

Statement of the Problem

Traditional approaches to teaching and learning are being replaced rapidly by the introduction of technology into the classroom using blended learning (Hayfa & Othaman, 2014; Zipporah, 2014). According to Stacey and

Gerbic (2017), students' learning experience and performance can be improved when technology is integrated into teaching and learning. In a similar vein, Chaney (2016) argues that it's assumed that the use of technology in teaching works well and better wherever it is tried.

However, in Ghana the use of technology for teaching using blended learning approach is still in its infancy stage and has not fully taken shape. Adu Gyamfi Senior High School has been provided with an IBOX teaching platform by the World Bank to support their instructional strategy delivery to students. The school is using this IBOX platform to support instructional delivery. The IBOX platform has content of teaching and learning materials and lesson tutorials for their students to watch them latter. As at now, the IBOX have learning content on the core subjects like English language, core mathematics, integrated science and information and communication technology. They also have learning content in science subjects like chemistry, biology, physics and elective mathematics.

However, it is observed that the teachers in the school often failed to integrate technology into their instruction even though the appropriate technologies are readily available. Moreover, if technology is merely used and is not clearly linked to lectures and tutorials, there is a risk that students will become disenchanted and any potential benefits will be lost. It is against this background that the study seeks to investigate the perception of teachers on the use of technology as an instructional strategy for teaching using blended learning approach.

Objectives of the Study

The study investigated the impact of blended learning on students using IBOX platform. The specific objectives of the study were to:

1. Determine teachers' perception towards the use of blended learning technology in teaching.
2. Determine if the use of technology in teaching enhances students learning in the classroom.
3. Investigate the strategies teachers use to integrate blended learning technology in their teaching.
4. Determine the barriers hindering the integration of blended learning technology in education.

Research Questions

In order to address the specific objectives, the following questions were formulated to guide the study:

1. What are the perceptions of teachers towards the use of blended learning technology in teaching?
2. Does the use of blended learning technology in teaching enhance students learning in the classroom?
3. What are the strategies teachers use to integrate blended learning technology in their teaching?
4. What are the barriers hindering the integration of blended learning technology in education?

Significance of the Study

A study into the perception of senior high school teachers towards the use of blended learning technology as an instructional strategy will make some contribution to the existing knowledge. At the end of the study, it is hoped that teachers' and students' attitude towards the use of blended learning technology in teaching will be improved and their entire performance gap in teaching will be addressed.

The essence of any research is to address the void in our minds and add new knowledge to the existing ones. It is expected that the results of the study will help policy-makers in Ghana to determine instructional strategies that encourage the use of blended learning technology for teaching to improve the current methods of teaching.

Identifying the issues contributing to increasing student achievement using blended learning technology in teaching will provide valuable insight into ways to enhance student achievement. Determining the best practices and processes to be used in integrating technology in teaching at the Senior High Schools may create a pathway for improving student performance and achievement. The results of this research may enable stakeholders to modify their teaching program to increase student academic success using technology. Also, this study may also help to raise awareness among policymakers, Directors of Education, Head teachers and teachers on the barriers of integrating blended learning technology in education. A thorough understanding of barriers, will inform educators, in deciding how to address them, with the hope that they can be minimized if not eliminated entirely.

Delimitation of the Study

It would have been best to interview all senior high school teachers in Ghana who use blended learning in their teaching to arrive at the best result, however, the study was delimited to only teachers in Adu Gyamfi Senior High School.

Sampson and Fytros (2015) described seven basic skills commonly used in practicing and processing blended learning applications and they are ICT skills, email, spreadsheets, word processing, file navigation, presentation packages, and databases. Only the ICT skills were measured whilst the rest of the indicators were not considered.

Limitations of the Study

The limitations of this study warrant discussion and suggest the need for caution when interpreting the results. The findings of this study can be generalized for all sampled teachers in Adu Gyamfi Senior High School, but could not be generalized for all Senior High Schools in Ghana because of the sampling procedure that was used for selecting the teachers and schools. Another limitation of this study was the population as it was restricted to only those teachers who used blended learning technology in their teaching as the primary instructional strategy.

The study encountered some challenges which included the response rate of the respondents, vacations when schools were closed, teachers might being difficult to reach to respond to the questionnaire and teachers' unwillingness to participate in the study. These variables cannot be controlled and therefore they could affect the final results of the study. Measures were

however taken to minimize the effects of these on the final results of the study by explaining the benefits of the study to them.

Definition of Terms

Attitude: A predisposition or a tendency to respond positively or negatively towards a certain idea, object, person, or situation.

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

Blended learning: They are instructional platforms or devices that combine traditional face-to-face education with electronic-learning content.

Digital resources: Resources that were created using digital technology to disseminate and access learning materials online.

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.

Information technology (IT): Various types of computer hardware, software, telecommunications technologies, and multimedia tools that are used to input, process, and store information.

Information and communication technologies: The use of computers, communication networks, and the Internet.

Online learning resources: They are digital materials that are used for supporting student learning in blended learning or online courses.

Organization of the Study

The study is organized into five different chapters. The first chapter talks about the background to the study, the statement of the problem, the research objectives and research questions. The chapter also deals with the significance of the study, the delimitations and limitations encountered in the study. The second chapter deals with the review of the related literature and the theoretical framework for the study. The third chapter talks about the research methodology that was used in the study. The fourth chapter dealt with the presentation and analysis of the data collected. The last chapter, which is chapter five talks about the summary of findings, the conclusions that were drawn and the recommendations thereof.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

Introduction

The research seeks to review literature based on the objectives and research questions. There is the need to review literature related to this work to establish the basis for the study. For easy referencing, this literature is reviewed under the following sub-headings:

Theoretical Framework

Blended Learning

Perceptions of Teachers towards the use of Blended Learning

Benefits of Blended Learning

Barriers Hindering the Integration of Blended Learning in Education

Strategies Teachers Use to Integrate Blended Learning in Teaching

Theoretical Framework

The study was underpinned by social constructivist framework, which views blended learning as a source of collaboration, interaction and motivation to help teachers create a learning environment (Ebert, 2015). According to Paily (2013), social constructivism is a learning theory where teachers and students work together to explore and create new knowledge with the support of technology. He further elaborated that the social constructivist model focuses on personalized learning within the context of social learning and sees knowledge as a human product that is socially and culturally constructed.

In the view of Cleary, Horsfall and Hayter (2014), social constructivist theory involved the use of a qualitative research entrenched epistemologically. 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 students are exposed to real-world experiences and are actively involved in the learning process by having exposure to technology (Aldoobie, 2015).

Learning is a social process that occurs when people engage with each other (Horn & Staker, 2011). According to them, learning is not a journey of passive development but rather an active one that is shaped by external forces. Students can create meaning through their social interactions with others and the environment. The importance of learning through social engagement, interaction, and collaboration originated from Vygotsky (1978) who review that learning is associated directly with social development. Vygotsky's (1978) theory states that learning 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 students were presented with materials to follow up on their performance using technological tools. Social constructivists consider the types of tools that are used by teachers to regulate their students' online presence and their usefulness to the course. In alignment with the tenets of social constructivism, study provided teachers with 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 students' learning. Vygotsky's (1986) reveals 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's (1986) further recommended direct and guided teaching to assist in students' cognitive development, while stressing the need for peer interaction and cooperative learning. The study therefore employed the social constructivist framework to investigate the perception of teachers on the use of blended learning as an instructional strategy. The theory is applicable in the study as the theoretical processes have a bearing on the quality of education.

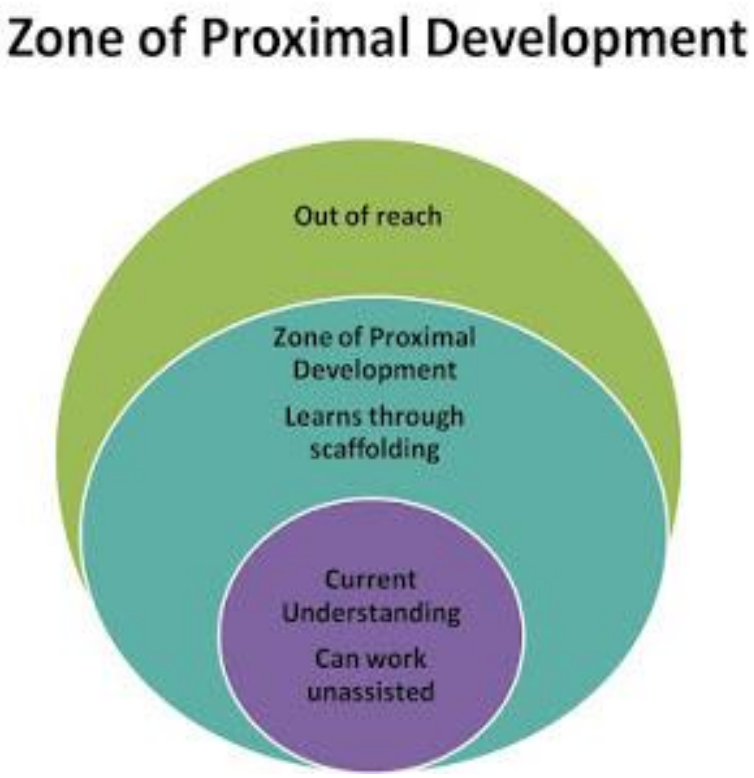

Figure 1: Zone of Proximal Development (ZPD)

Blended Learning

There is no simple definition of blended learning (Alammary, Sheard & Carbone, 2014). According to Horn and Staker (2011), blended learning occur when students learn in both a classroom building environment and an online environment with control over the path, methods, pace and utilization. In a similar vein, 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. In a similar vein, Morris (2016), blended learning allows for the enhancement of face-to-face interaction between teachers and students using internet or computer based tools.

Blended learning is seen as a format that will assist teachers in integrating technology and allow them to use face-to-face instructional classes to meet the different learning needs of their students (Kleber, 2015). Kleber (2015) further elaborated that blended learning include effective instructional strategies for teaching with technology in and out of the classroom. Teachers will benefit from using blended learning to improved classroom efficiency, increased teaching flexibility and better learning outcomes through collaboration (Owston, York & Murtha, 2013).

The primary goal of using blended learning is to enable higher learning and enhance learner-centered pedagogy (Shibley, 2014). As such, blended learning activities will need to involve students being able to access emails, e-books, e-journals, complete online assessments and collaborate with colleagues and teachers using discussion forums and chat rooms (Mohammadyari & Singh, 2015). According to Benson and Kolsaker (2015), the use of blended learning in teaching will offer students opportunities to learn in an online setting.

In considering the blended learning, Huang, Ding and Zhang (2017) posit that student engagement is achieved when the curriculum is well-designed using blended learning approach. Huang et al. (2017) further suggested that blended learning can incorporate the use of emails, discussion forums and chat rooms to enhance student engagement and learning. The use of these tools to incorporate technology into the classroom, along with teacher support, will raise student engagement.

In addition to Huang et al. (2017) 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 these 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.

Blended learning is described as a learning environment that either combines teaching methods, delivery methods, media formats or a mixture of all these (Singh, 2013). Singh (2013) elaborated that blended learning is a set of learning strategies or dimensions that mixes various event-based activities, including traditional instructor-led training, synchronous online conferencing or training and asynchronous self-paced study. In the view of Moebs and Weibelzahl (2016), blended learning integrates learning activities such as a mixture of online and face-to-face learning.

In other words, blended learning is a mixture of e-learning and traditional types of learning (Hisham, Che & Hassan, 2006). According to Hisham, Che and Hassan (2006), blended learning integrates combination of traditional learning with web-based online approaches. The combination of media and tools deployed in an e-learning environment helps to achieve the pedagogical approaches in blended learning.

Perceptions of Teachers towards the Use of Blended Learning

Blended learning must be focused on personalize learning and engagement of students using technology (Horn & Staker, 2011). According to them, teachers use blended learning as a tool for online assessments for

regular interaction and feedback between their students. The teachers spoke of using blended learning activities to support their teaching to motivate their students through the use of technological media. By interacting in both environments, the teachers believe that a social and teaching presence occurs with the support of technology.

As observed by Tomlinson and Whittaker (2013), when students take active roles and remain engaged in blended learning activities, they are likely to succeed in their learning based on an increase in self-efficacy. According to Tomlinson and Whittaker (2013), the teachers' presence is a critical construct to consider in the facilitation of blended learning. Blended learning can provide students with unlimited access to a variety of learning resources and activities, finding the right balance between what are face-to-face and online are most critical factor for teachers (Krasnova & Ananjev, 2015).

In another study, Teo (2008) assessed teachers' perception towards blended learning use to teaching in Singapore. Teachers were assessed for their perception on blended learning based on four factors: affect (liking), perceived usefulness, perceived control and behavioural intention to use the computer. Teo (2008) indicated that teachers were more positive about their attitude towards using blended learning in the classroom and intention to use computer than their perceptions of the usefulness of the computer and their control of the computer.

Similarly, Mwalongo (2012) examined teachers' perceptions about using blended learning for teaching, professional development, administration and personal use in Tanzania. Mwalongo (2012) reported that blended learning was used to carry out administrative tasks such as students computing

skills and to achieve schemes of work`. However, he agrees with Unachukwu and Nwankwo (2012) that teachers did not use blended learning to bring change in their practices but rather sustain their traditional practices.

Benefits of Blended Learning

Blended learning pedagogies have been recognized as a path to improve student collaboration and promote academic performance (Poon, 2013). According to Poon (2013), blended learning support student success and achievement in the classroom. Emphasizing the necessity to move beyond individual needs by focusing on the social context of learning, Mwalongo (2012) suggested the use of blended learning to help to promote collaborative learning, interactive learning and authentic learning.

According to Poon (2013) and 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. In a similar vein, Trowler and Trowler (2010) noted that the use of blended learning in teaching offers students enough support to improve their levels of engagement and development.

Huang and Chiu (2015) noted that the emergence of blended learning in 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 in blended learning. Comparative views were supported by Demir-Kaymak and Horzum (2013), Liaw and

Huang (2013) and Tang and Lim (2013), who agreed that blended learning modes of study are associated positively with student achievement.

Using blended learning technologies in education builds relationships between students because of the collaboration, mentoring and coaching that occur 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 in blended learning. Such technological tools can offer students the opportunity to communicate asynchronously and synchronously using interactive features of the blended learning (Amandu, Muliira & Fronda, 2013; Martin & Parker, 2014).

Researchers noted that the use of Web 2. 0 tools in a blended learning environment were 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. In a similar vein, Norris, Sporre and Svendsen (2013) also provided evidence that the use of blended learning in the classroom offer students better opportunities to become active participants in their learning environment. 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).

According to Morris (2016), blended learning has beneficial effects for students both in improvements to academic performance, diversity of learning opportunities and enhancements to the student experience. According to him, higher education institutions should be encouraged to facilitate the

development of a wider range of blended learning resources to support students learning, particularly with the advent of increased, fast and reliable access to internet services for students because of the benefits students get from it.

Noirid and Srisa-ard (2007) asserted that, blended learning had the potential to increase learners' comprehension and application of newly acquired skills. Similarly, studies conducted by Graham, Allen and Ure (2003), Rooney (2003), Morgan (2014) and Reay (2001) asserted that blended learning has become a learning mode that is increasingly being adopted in educational and training environments as an effective strategy to improve learning and training outcomes compared to online learning alone.

Blended learning as an instructional tool for teaching and learning are promulgated as a source of collaboration, interaction and motivation to help both teachers and students create a learning environment (Paily, 2013). As with such curricular reforms, educational implementers will become concerned and preoccupied with the role teachers played in ensuring the learning platform is effective.

Halverson, Graham, Spring, Drysdale and Henrie (2014) argued that blended learning are 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.

Deschacht and Geoman (2015) also revealed that students who used the blended learning delivery model improved their academic performance. Xu, Huang, Wang and Heales (2014) 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 the use of blended learning in teaching improves student academic performance (Gedera, 2014). Considering these facts, we can say that there is the need for secondary schools to prepare their students and more importantly, their teachers for the adoption of blended learning in their teaching.

Barriers Hindering the Integration of Blended Learning in Education

Deviating from the benefits of using blended learning, some studies recognized challenges in successfully integrating blended learning into tertiary education programmes. 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 barriers considered as detractors to student achievements in blended learning environment. Their study found no remarkable difference in academic success between the traditional and the technology aided modes of instruction.

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 (Hill, Chidambaram and Summers, 2013). They posit that students perform equally in both learning environments.

Gedik (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 (Hill, Chidambaram and Summers. 2013).

Gedik (2013) also discovered that teachers 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. This study highlighted teachers 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 (2015) who saw that 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, there will be challenges (Richardson, 2015). Hofman (2014) confirmed that

when teachers get into difficulty with technology, this may lead to failing to use the technology in teaching.

In turn, Koch (2014) observes that if teachers do not have sufficient time to use teaching tools for blended learning, it will be difficult for teachers to use it. 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 activities (Horn & Staker, 2011; De George-Walker & Keeffe, 2010).

As research suggests, facilitating blended 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 teachers' 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 students 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.

A willingness to accept new technologies could significantly affect the success of blended learning development. Charles and Anthony (2017) report that core faculty perceive the development of online-based activities as time-consuming and are more likely to shy away from technology-facilitated interactions. A preparation time of at least six months is suggested for blended

learning integration with a great impetus on encouraging academics to apply blended learning pedagogy and exchange good practices from those experienced in the effective use of blended learning (Charles & Anthony, 2017).

A considerable challenge for schools 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 designed 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).

Strategies Teachers Can Use to Integrate Blended Learning in Teaching

Complete facilities like well-furnished computer labs, internet connection, provision for video chatting is a compulsory factor for blended learning. Blended learning largely depend on infrastructure, school should not only have good classrooms but should also have well-furnished computer laboratories, Internet facility, strong Wi-Fi on campus with sufficient number of computers to cater for all the students if possible.

Kerr's (2015) study addresses the issues highlighted in the literature as affecting the use of blended learning as a strategy for improving student achievement. Moreover, to achieve this, teachers can use 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 blended learning activities promoted the use of live chats and the use of social media as part of the teaching and learning process. Therefore, timeliness of teachers' feedback will encourage interest and motivation to complete the assignment in addition to clarifying uncertainty on the subject matter on the platform for teachers.

Regarding the structure of the course, Kerr (2015) revealed that the fast pacing of classes; the deadline for assignments and the quality of material uploaded, significantly impeded 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 (Charles & Anthony, 2017).

One of the core objectives of a blended learning model is to personalize instruction to meet the specific needs of each student. However, if the school chooses a technology-based curriculum that does not include an element of scaffolding and adaptive technology, student learning will be no more personalized than like the traditional "one size fits all" instruction. As a result, on-level and advanced students might become disengaged or bored, while struggling students will experience frustration if the task is too difficult

(Richardson, 2015). Teachers should make sure that the types of blended learning they are using motivate students to engage in the activities but not discouraging them.

A considerable challenge for tertiary institutions implementing blended learning lies in the difficulty teachers experienced in acquiring new learning technology skills to foster online learning community and facilitate online discussion forums in blended learning (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 that 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).

Teachers should be well acquainted with the concept of blended learning and fully trained and skilled to blend both types of approaches and technological (Hill, Chidambaram & Summers, 2013). According to Hill, Chidambaram and Summers (2013), teachers should be trained to develop content in digital form so that it can be available to students online. They should be well versed with internet browsing and internet terminology should be aware of all the websites that can be useful for the students while learning online. Teachers should know how to utilize blogs, you tube facility, software like Skype, Google for video conferencing and social networking sites for educational purposes (Kerr, 2015).

According to Morris (2016), it is very important that teachers should have scientific attitude to be able to use blended learning in their teaching. They should have good observation skill; they should be optimistic and should have problem solving skills (Hofman, 2014). Scientific attitude will help the teachers to deal positively with failures they will encounter while working on this innovative concept and will help to analyse the conditions objectively. In the view of Cavanaugh, Sessums and Drexler (2014), this right type of attitude will automatically filter from teachers to students.

According to Unachukwu and Nwankwo (2012), the system should be flexible, with flexible time table system. The provision should be made for online examination for making the system more flexible (Lalima & Dangwal, 2017). When the right technology tools are used, students experience is monitored in real-time. Teachers can view data showing which students have completed each skill area and which students have encountered an obstacle and require individual or small group direct instruction. These data inform the instructional plans in the classroom, helping the teachers to be targeted and time efficient in focusing on the students most in need of help (Kerr, 2015).

Wikan and Molster (2011) also found that teachers, who use blended learning in their teaching 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 learning environments for both students and teachers.

Conceptual Framework

Several models have been identified for the adoption of technologies and to predict its actual use but for the purpose of this study Unified Theory of Acceptance and Use of Technology (UTAUT) has been adopted because it is widely used and well validated among researchers.

Venkatesh, Morris, Davis and Davis (2003) formulated the Unified Theory of Acceptance and Use of Technology (UTAUT). UTUAT is based upon the conceptual and empirical similarities across different technology acceptance models. The model consists of four constructs and states that these constructs explain user acceptance and use of technologies. They are performance expectancy, effort expectancy, social influence and facilitating conditions.

Performance expectancy is the degree to which using a system will improve the performance of the student. This construct has been the strongest in predicting behavioural intention (Venkatesh et al. 2003). According to Venkatesh et al (2003), effort expectancy is defined as the degree to which people believes that the adoption of blended learning will be easy.

Social influence is described as the degree a user thinks people he considers important should use the system (Venkatesh et al. 2003). It has been shown that there is a positive effect between social influence and intention to use a technology. Facilitating condition is the degree that people believes the organizational policies and structures and technical infrastructure support blended learning.

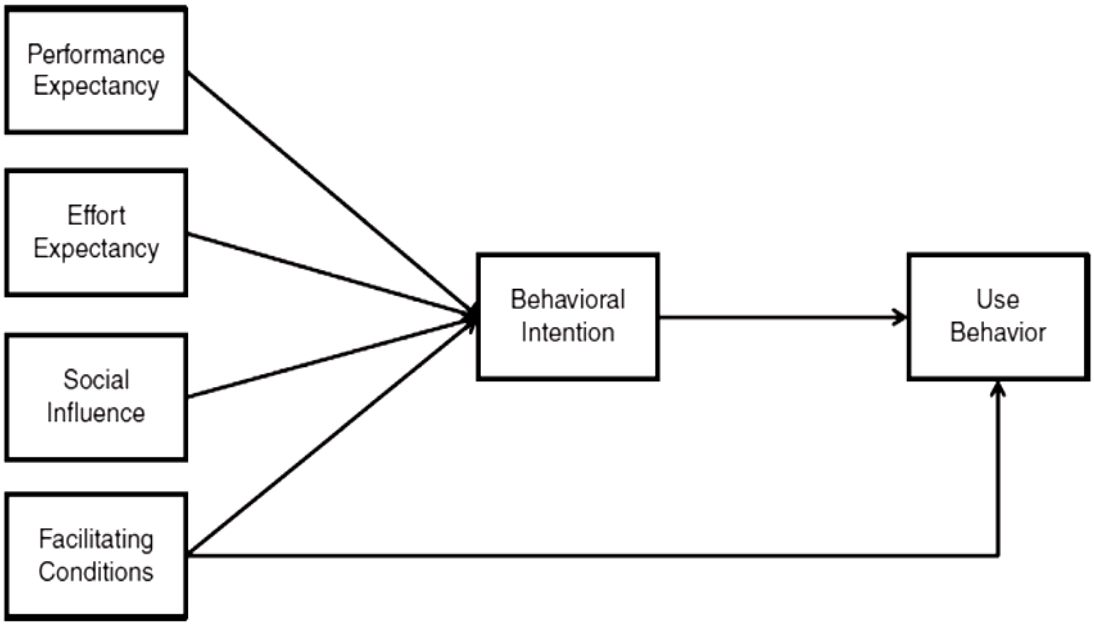

Figure 2: Model of Unified Theory of Acceptance and Use of Technology

Summary of Literature Review

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.

CHAPTER THREE

RESEARCH METHODS

Introduction

This chapter describes the methods and procedures used to conduct the study and focuses on the research design, population, sample and sampling technique, research instrument, data collection procedure and analysis.

Research design

Babbie (1992) describes a research design as a plan or blueprint of how one proposes to do a research. The research design determines the research methods and procedures to be applied as determined by the nature of the research problem or objectives of the study. According to Cresswell (2014), a research design can be qualitative, quantitative or both. Research design relates to the general approach adopted in executing the study. The researcher has to specify the type of the design followed in the study (Oyedele, 2003).

Varieties of research design exist for researchers to use. The single case study research design was a preferred choice for this research because the research focuses on investigating the perception of Senior High School teachers on the use of blended learning as an instructional strategy. According to Yin (2009), a single case study investigates contemporary phenomenon within real life context. As an issue within the single bounded case by location, the single case study research design help to explain the issues under study (Stake, 2005). The size of the bounded case and the intent of the research are criteria for the choice a researcher adopts.

By using the case study approach, the study investigated the practices and processes used by the teachers in their technology-rich classrooms. This case study approach includes empirical inquiries using semi-structured 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.

This study adopted the qualitative research approaches. Qualitative research provides a better understanding of a person's experiences and behaviour 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. The qualitative case study design was used to understand the processes and practices teachers used in their blended learning courses to impact student outcomes. The blended learning curriculum included a social constructivist approach, and a 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.

Cibangu (2013) view qualitative research as a "research wherein the investigation of that which is being studied and the analysis obtained are not statistical and those involved are at least one participant (n = 1)". This view is

supported by Nel (2015) who reveals that qualitative data are not expressed in numbers or ordinal values. Qualitative research aims at understanding individuals' behaviour from their own points of view. This insight and understanding of human behaviour may be based to "study real-life situations as they unfold naturally" (Patton 1990).

In addition, qualitative research provides a holistic examination of research based on interviews, observations, or focus groups, which focuses primarily on life experiences, social processes, and organizational structures and settings (Strauss & Corbin, 1990). They further argue that, it is effective in obtaining culturally specific information about the values, opinions, behaviour and social contexts of a particular population that produces findings not arrived at by means of statistical procedures or other means of measurement.

The strength of qualitative research is its ability to provide complex textual descriptions of how people experience a given research issue (Katundu, 2008). Creswell (2003) has observed that this approach provides effective responses to researchers and it is flexible in nature to achieve the desired results. It provides information about the "human" side of an issue; that is, the often-contradictory behaviours, beliefs, opinions, emotions and relationships of individuals. Outcomes from qualitative research is usually extended to people with attributes like those in the target population in order to gain a better and complex understanding of a specific social issue (Leady, 2011).

Despite these strengths of qualitative research, it exhibits some weaknesses. Patton (1990) has argued that some sensitive and private information observed cannot be reported by the researcher who may be seen as

been intrusive. Again, the researcher may not have good attending and observation skills, some respondents may present special problems to acquire rapport or favour from the researchers (Leady, 2011).

Interviews provide indirect information filtered through the views of interviewees and interviews provide information in a designated 'place' rather than the natural field setting (Stevens, 2012). Also, the researcher's presence may elicit bias responses from participants and they may report what interest them and people may equally not articulate and perceive the real issues.

Population

According to Cohen, Manion and Morrison (2006), population describes the characteristics of object, people, humans, objects, groups, organization, cases or elements from which generalization can be made from its study. In a similar vein, Ary, Jacobs and Razavieh (1990) defined population as all members of a defined category of elements such as people, events or individual items of interest under consideration. Population is also referred to as the total number of subjects a research can conform to a clearly defined set of characteristics (Awanta & Asiedu-Addo, 2008). The population for the study was all teachers in the Adu Gyamfi Senior High School in Ashanti Region.

The study population is the representation of elements from which the sample is selected and every individual with the same characteristics have the same chance of selecting for the sample (Mukhari 2016). According to Mukhari (2016), the population is regarded as the "target population" and it is the set of elements that the investigator focuses upon. The total population for

the study comprised all eighty-eight (88) teachers in the school. The reason for the selected school was that the researcher was very conversant with the school settings. For the purpose of this study, the research sample was drawn from this population.

Sample and Sampling Techniques

The aim of qualitative research is to understand from within the subjective reality of the study participants (Bhanagar, 2012) which involve reaching out to individuals who are ready to share the reality in order to get variety of ideas on the issue within the study population. There are no close defined rules for sampling in qualitative research and the sampling normally relies on small numbers with an intention of studying in-depth and detail (Tuckett, 2004).

Sampling is a process of selecting a number of individuals for a study in such a way that they represent the larger group from which they were selected. Welsh (2006) defines sampling as the process of choosing from a much larger population, a group about which we wish to make generalised statements so that the selected part will represent the total group. Sampling per say is not a technique or procedure for getting information but it ensured that any technique used helped in getting information from a smaller group, which accurately represented the entire group (Teye, 2012).

Qualitative researchers have shown a tendency to use nonprobability or non-random samples (Gentles, Charles, Ploeg & McKibbon, 2015). This means they rarely determine the sample size in advance and have limited knowledge about the larger group from which the sample is taken. Neuman

(2006) indicated that nonprobability sampling includes convenience sampling also called accidental/availability or haphazard sampling.

The purposive sampling was used in selecting a representative of the target population per the objectives of the research. Purposive sampling according to Creswell (2012) involves selecting individuals or groups who have experienced the phenomenon under study. In the view of Teddie and Tashaskkori (2003), purposive sampling is used in inductive studies to gather detail and in-depth information or data with small number of participants to represent the target population in order to yield detailed information about the issues. When used appropriately, this technique of data collection is efficient and practical, when compared to a random sampling approach.

In all, ten teachers who use blended learning in their teaching were selected for the study. The researcher selected the participants from the Adu Gyamfi Senior High School. 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 information for this study. 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 the IBOX during their teaching hours were checked to provide the necessary details to identify the teachers who use blended learning. These teachers used Moodle collaborative, assessment and evaluation tools and were teaching different subjects in the school.

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 use the IBOX platform collaborative tools such as the discussion forums or online chats.

I use the IBOX platform assessment tools such as assignments and/or exercises platforms.

I use IBOX evaluation tools such as the grade book or activity reports.

Research Instrument

Interview was used as research instrument to collect data for the study. An interview is a data collection method in which an interviewer poses questions to an interviewee (Johnson & Christensen, 2004; Shank, 2006). In this study, the semi-structured interview was used to gather data for the study. The semi-structured interview was the information collection technique used to interview teachers who use blended learning in their teaching. The semi-structured interview was chosen because, by its nature, it gives participants the freedom to answer questions in any way they deemed fit which also provide a comprehensive and comparable data (Sidhu 2002).

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 allowed the researcher to determine how the situation is understood in the respondents' mind (Merriam, 2009). In the view of Creswell (2014), interviewing offers in-depth information connecting the participants' experience and viewpoints of a topic. Through formal interviews and informal communication, the researcher obtained participants' perceptions of the blended learning program implementation and student achievement.

According to Gall, Gall and Borg (2007), semi-structured interviews involve asking a series of structured questions and then probing more deeply, using open-ended questions to obtain additional information. They further state that this interview approach has the advantage of providing reasonably standard data across respondents, but of greater depth than can be obtained from a structured interview.

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).

Regardless of these merits, the interview schedule comes with some weaknesses or limitations. According to Sidhu (2002), one of such weakness

is interviewer bias. According to him, the interviewers are allowed to vary their approach to fit the occasion, they are likely to project their own personality into the situation and thus influence the responses they receive. In a similar vein, Patton (1990) observes that interviewees may distort information through recall error, selective perceptions and desire to please interviewer. However, with regard to the present study this bias was overcome by the fact that the researcher was the only person who collected the research data.

Prior to the interview, the interview questions were given to participants to enable them prepare adequately. A semi-structured open-ended interview guide was used to gather the data for the research. The researcher formulated the interview guide with the aid of the information gotten from the literature reviewed which addressed the research questions (Creswell, 2003). It was adopted for the research to prevent participants from giving so much irrelevant information. A sample of the interview schedule appeared in Appendix B.

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 (see Appendix A). The interviews were carried out in an atmosphere of ease and comfort as it was essential to put the participant at ease before questioning those questions (Smith & Osborn, 2007). By this, the respondents were able to talk freely about their experiences and feelings (Bogdan & Bilken, 2007). A drafted copy

of the semi-structured interview questions was made available to my supervisor for face to face discussion and content validity.

Interview Observation Sheet

As the interview continued to the information gathering stage, the researcher used an interview sheet to guide and record responses. Teachers' 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; their specific behaviour 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 academic 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, the researcher reviewed vital points; clarified issues to confirm accuracy and give the participants the opportunity to make general comments. The interviews sessions were audiotaped and later transcribed in their entirety.

Data Collection Procedures

An introduction letter from the researcher's head of department was presented to the participants to enable them understand the research as academic and provide the researcher with the needed assistance. Permission to participate were also sought from the participants personally with a letter to

enable them accept or reject to participate. The researcher requested from the participants to record them and they had full permission to withdraw from participating anytime. Due to the research design and the approach adopted for the research, ten face-to-face interviews were conducted with teachers who use blended learning in their delivery.

None were interviewed by phone because all participants preferred face-to-face and the researcher wanted to observe the reactions of the participants. Prior to the interview, the interview questions were given to participants to enable them prepare adequately. A semi-structured open-ended interview guide is represented in Appendix B. The researcher formulated the interview guide with the aid of the information gotten from the literature reviewed which addressed the research questions (Creswell, 2003). It was adopted for the research to prevent participants from giving so much irrelevant information.

In preparing the interview sheet, (Appendix B), the researcher used qualitative terms such as “perceptions,” “describe,” and “experiences.” Yin (2014) suggested that 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 (2014) also advised that interview questions should focus on the phenomenon within a real-life context. A probing questioning technique encouraged the participants to reply freely about their practices and processes use during the blended learning initiative. Avoiding leading questions and allowing the respondents to lead the interviews, the teachers were encouraged to be more open to voicing their views and experiences.

The order of the interview questions were organized to encourage the participants to remain focused on their responses (Creswell, 2012). Demographic questions were given 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 Senior High School was before integrating blended learning. Most of the questions were direct and the participants were to offer feedback regarding their experiences as a blended learning teacher. Questions were also gathered on the participants' processes used to motivate students toward higher performance standards using blended learning. Questions were discussed on the challenges they encountered, which may have hampered students' performance.

Using an interview tocol adapted from Kasunic (2010), the interview sessions started with formal introductions and a review of the purpose of the research. As the interview proceeds to the information gathering stage, the researcher used an interview sheet to guide the interview and to record responses (Kasunic, 2010). In wrapping up the interview, the researcher reviewed the vital points and clarifies issues to confirm accuracy with the respondents. The researcher thanked the participants and make arrangements for future contact.

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.

Pretest

The interview guide were pre-tested at Agona SDA Senior High School in the Ashanti Region of Ghana because this is a Senior High School with the same characteristics as the case understudy and the school has the same category of teachers who use blended learning in their teaching. Three teachers were used for the pretest. The pre-testing was done to verify the validity and reliability of the data collection instrument. Ambiguous questions were modified for clearer meaning and questions that are difficult to understand were deleted before the instrument was used for the data collection. Initially, there were no questions the training teachers received before they started using the technology, but the final interviewed questions had that question.

Data Analysis

In analysing data, Creswell (2012) presented steps which involve preparing, organising and interpreting the interview data. By typing and reading the interview responses and comparing the responses to the information provided in the document (literature), 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). According to Creswell (2012), this process is referred to as 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. 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, 2010).

Analysing the transcripts against the literature and evaluation reports provided by the teachers, the researcher 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) observed that coding in qualitative research is problematic and efforts should be made to limit questions along the themes to categorise reoccurring concepts and experiences.

Coding data in qualitative research can be difficult (Creswell, 2012) so the researcher made every effort to keep questions along particular themes in addition to keeping the sample small, to identify reoccurring ideas and experiences. Coding were done using predetermined themes from the literature review, as well as emergent themes from the data. Creswell (2012) stated that thematic analysis would provide researchers the opportunities to code data, categorise into various themes and note patterns. This approach was appropriate for coding as it allowed for the natural grouping of issues that influenced the perceptions of the interviewees. According to Creswell (2012), 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, the researcher first located the central categories that relate to the topic.

Gall, Gall and Borg (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. Gall, Gall and Borg (2007) confirmed that sifting through data for shared themes lessening 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 to the theme data were identified (Lodico, 2010). When these discrepant cases appeared, the researcher reanalyzed the data to categorise the new theme.

Ethical Consideration

Ethics in research study refers to the beliefs and codes of conduct of what are morally and legally right or wrong in conducting research (Babbie, 2010). In a similar vein, Welman, Kruger and Mitchell (2000) stated that the idea behind 'research ethics' are universal and deals with issues such as honesty and respect for the rights of the participants. Research ethical issues are important and it helps researchers to protect the dignity of their participants and develop trust among participants (Creswell, 2009).

Some of ethical issues requiring consideration were the length of time the interview took, statement indicating what happened to the information

collected and statement about confidentiality and anonymity. The participants were assured that the data would be used for academic purposes only.

For the sake of ethics, an introductory letter from the University of Cape Coast was obtained and was presented to the Director of Human Resource for the approval before the interview were conducted. Explanation was also given to the participants about the purpose of the study and the approval and co-operation of the interviewee was sought before being allowed to participate in the interview. All these participants were contacted personally with invitation to participate in the study. With this invitation, participants were introduced to the study and all information pertaining to the process of the interview. Permission was sought from the participants to record the interview.

In the view of Somekh and Lewin (2005), confidentiality is an ethical principle that motivates participants to express their opinion in confidence. Confidentiality was maintained as interviewees were assured that their names will be kept anonymous and therefore they were not expected to write their names on the semi-structured interview guide. Participants were not forced to take part in the study against their will and they were informed that they have the right to participate in the study or withdraw from the study at any possible time.

Confidentiality was maintained as interviewees were assured that their names were to be kept anonymous and therefore they were not expected to write their names on the semi-structured guide. Considerable care was taken to ensure that teachers did not feel pressured to participate in the study. It was explained to the participants that their involvement was voluntary, and

refusing to take part or to continue participating will not present any disadvantages or loss to them. They were also informed that they could break or end the interview if they so require. As suggested by Merriam (2009), an open and positive relationship were developed with each participant by letting them have sufficient time to respond to questions, voice their concerns and ask questions.

Chapter Summary

This chapter presented the research methods with discussions on: research approach; research design; study area, population; sampling procedure; data collection instrument; data collection procedures; data processing and analysis. The next chapter presents the results and discussion of the data collected

CHAPTER FOUR

RESULTS AND DISCUSSION

Introduction

This chapter deals with the data presentation and analysis. All data gathered for the study are organized and analysed. This is followed by discussion of key issues relating to the findings of the study. Quotations and quotes were used to confirm statements to give statistical reflections on key issues in terms of the research questions. The main thrust of the study is to investigate the impact of blended learning on students using IBOX platform: Evidence of Adu Gyamfi Senior High School.

This chapter presents the data derived and provides direct quotations from participant under each theme, present the results and discussion and analyse the data by comparing the texts to the literature reviewed to find out if the results of the data and the findings validate what is written in the literature.

Demographic Characteristics of the Respondents

The demographic characteristics considered in the study are gender, age and teaching experience. The demographic characteristics of the respondents helped in determining the extent to which the responses they provided could be depended upon. The details of their responses are presented in Table 1.

Table 1: Demographic Characteristics of the Respondents

Item	Frequency	Percent
Age:		
Under 25 years	1	10.0
26 – 35 years	3	30.0
36 – 45 years	4	40.0
46 – 55 years	2	20.0
Above 56 years	-	-
Gender:		
Male	6	60.0
Female	4	40.0
Teaching experience:		
1 – 5 years	2	20.0
6 – 10 years	4	40.0
11 – 15 years	3	30.0
Above 16 years	1	10.0

Source: Field data, 2019.

It was necessary to determine the ages of the teachers, since this information would help to know how young or mature they are. The data in Table 1 indicates that 10.0% of them were under 25 age bracket, 30.0% of them were between the 26 – 35 age brackets and 40.0% of them were between 36 – 45 age brackets. Another 20.0% of them fell between 46 – 55 age brackets and none of the teachers fell in the above 56 age brackets. The values of this analysis shows that the teachers used in the study have their ages spread across all categories of age group, that is young, middle age and those

preparing to retire from active teaching service. They therefore cater for all the age interest needed for this study.

Out of the 10 respondents, 60.0% were males and 40.0% were females. This suggests that most of the teachers used in the study were males. Again, 20.0% of the teachers have taught between 1 – 5 years, 40.0% have taught between 6 – 10 years and 30.0% taught between 11 – 15 years. The remaining 10.0% of the teachers have taught more than 16 years. The fact that more than 80% of the teachers have more than 6 years of teaching experience is encouraging. Experience might not necessarily be the best teacher, but it almost always results in the most enduring lessons.

Research Question 1: What are the perceptions of teachers towards the use of blended learning technology in teaching?

Theme 1: Teachers perception on students' engagement with IBOX platform. Interviewees were asked to consider their perception towards the use of the IBOX platform as a teaching instruction strategy tool to engage students. The teachers indicated positive views on the use of the IBOX platform in teaching. The teachers, however, noted that using IBOX platform in teaching achieved results due to the various types of technologies they use to engage the students. Participant 1 stated:

> *during teaching hours, using the IBOX platform enables students to understand the lesson better than the usual face to face because of the audio visual nature. They were able to get additional notes from online such as online videos activities and online simulations in the learning process.*

Participant 2 described using web-based interactive simulations in the IBOX platform to encourage further engagement of students in the classroom. Participant 2 further indicated that along with the animation, simulations were a great digital tool that enabled students to explore challenging concepts in mathematics learning. Participant 2 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 which makes teaching and learning easy. Similar to Participant's 1 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. Participant 3's approaches in using the IBOX platform included using sample questions with simulations. Participant 4 used a similar approach in that it allowed students to log into the IBOX platform 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 the students more opportunities to become involve in what was being taught.

Some teachers also revealed that, the reason for using simulations and videos was to encourage engagement discussion and collaboration among students. Participant 5 indicated that the use of technology in lessons are more

interesting and make teaching real for students to engage in and get them to show more interest in completing their assignments.

Participant 6 revealed that using technology approaches in teaching is promote learner centered learning than the face to face where students get the chance to ask 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 teachers' perception on students' engagement with the IBOX platform. Participants 1, 2 and 3 revealed that the online work ensured student participation throughout the teaching periods using the IBOX platform.

Participant 7 also used activities and resources into her classroom to increase student engagement by uploading assignments that emphasized practical assignments that focused on authentic tasks. Participant 5 agreed that students completed several online and in-class activities that were purposefully written to ensure understanding of the subject matter. Participant 7 added that by using online tools in teaching helped students engagement.

To support engagement, Participant 8 and 9 also revealed that students access to web-based resources during face-to-face sessions improve their understanding of the content. Participant 8 said that online resources give extra additional related information not included in textbooks for students. Participant 9 added that the use of IBOX platform gives teachers opportunity to uploaded PowerPoint presentations on each chapter of treated topics to

students. An analysis of the responses indicated that most teachers accessed the IBOX platform during class to give students the opportunity to view the relevant notes.

Participant 10 observed that when students used technology to understand a particular topic, they tend to work better in group work. Participant 10 further stated that, "students craved interactions with their peers and preferred to take part in learning that incorporated group activities using the IBOX platform".

It can be concluded teachers who used videos from the IBOX platform for teaching have positive perception about its use engaging students. The teachers felt that this form of technology brought the courses alive and allowed students to use their technology to understand more complex concepts. Findings emanating from the data showed that blended learning using the IBOX platform cultivated an environment which delivered higher student engagement, collaboration and interaction between students.

The study supports the findings of Vu, Cao, Vu and Cepero (2014), who concluded that teachers have positive perception about using technology in teaching. The outcome of this study agree with the study done by Vanderlinde, Aesaert and Van Braak (2014), who concluded that most teachers perception on technology is to train teachers on its use in teaching.

Research Question 2: Does the use of blended learning technology in teaching enhance students learning in the classroom?

In trying to answer this, respondents were asked about the impact of the blended learning technology on their students learning.

Theme 2: student success with IBOX platform.

A review of the interview transcripts showed impressive support that integration blended learning technology into teaching helped in student success. In response, the teachers felt that the use of IBOX platform in teaching enhance students learning performance. The teachers confirmed that moving from the traditional environment allowed most students to become independent learners as they engage in using technology in class.

Participant 1 indicated that

"*the increase in students' performance was due to the extra time students get to engage in practical sessions using the IBOX platform".*

As Participant 1 revealed the extra class time for practice, allow the teachers to identify individual problems that might not have been noticed before in real class periods which provide immediate feedback and take corrective actions. Participant 2 added that, due to more class time, she was able to see an increase in student performance as she was able to focus on students challenging areas.

Compared to student performance in the traditional environment, Participant 3 indicated that "the use of IBOX platform for teaching in the classroom increased students' performance". Participant 3 further indicated that the practice of using the IBOX platform helped students who were struggling in understanding concepts in science topics. To support students who were struggling, teachers ensured that they had access to videos and simulations that addressed central concepts. They also encouraged students to work online at their own pace and consulted them when they need help.

Participant 4 revealed that her students asked more insightful questions when courses are taught using the IBOX platform.

Participant 5 and 6 felt that the use of the IBOX platform in teaching assisted students in becoming more involved in active learning improves students recall and improve students understanding of concepts.

The results revealed that the use of the IBOX platform in teaching has increased students' performance. The findings concluded that the teachers who reported changes in students' success and achievement are those who use the IBOX platform in their lesson delivery.

The finding of the study support the work of Pittman and Gaines (2015), who revealed that most teachers provided arguments to prove that their teaching practices transformed students' learning experiences by integrating blended learning in the classroom. Onah, Sinclair and Boyatt (2014) also confirmed that different levels of blended learning activities use in the classroom increase students' achievement. The outcome of this study also agrees to Mayer (2001) research findings which observed that blended learning usage in teaching; improve students learning when compared to lectures method of teaching.

Research Question 3: What are the strategies teachers use to integrate blended learning technology in their teaching?

This research question seeks to find out the strategies teachers use to integrate blended learning technology in their classroom deliveries.

Participant 1 and 3 noted that students are always put into groups when using the IBOX platform in teaching. The teachers agreed that while using blended

learning technology for teaching helped the learning process, grouping students encourage collaboration learning among learners.

Participants 5, 6 and 7 also revealed that they use discussion and demonstration methods to integrate blended learning technology in their teaching. The use of this methods calls for the students to be actively engaged in their learning and have a quality educational experience that arouses their curiosity, strengthens initiatives and creativity.

Furthermore, Participants 8, 9 and 10 indicated that they use demonstration methods to integrate blended learning technology in their teaching. 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 to students that they were able to acquire new knowledge quickly for them to learn with multiple ways using technology.

The results of the study concluded that the effective way to integrate blended learning technology in teaching is to use discussion and demonstration methods. The result of this study support Harris (2016) argument that since teaching is driven by technology, for effective integration to be possible, teachers should use discussion and demonstration methods. The finding supports the work of Prestridge and Tondeur (2015), who concluded that using technology in teaching is effective when discussion methods are used for students to collaboratively share ideas.

Research Question 4: What are the barriers hindering the integration of technology in education?

In trying to answer this, respondents were asked the barriers they face hindering the integration of technology in their teaching.

Theme 4: Pedagogical challenges.

Although, the use of technology in teaching has the potential to support students learning, there are some issues that could hinder its use for teaching and learning. The teachers lamented that they began their teaching journey on their own and with limited support and training on how to integrate it in their teaching. They felt that if they were given specific training in designing and using online resources and activities, there would have been more success stories for them to tell.

The teachers indicated that like them, some students did not know how to use technology in their learning, while others were not ready to use technology for learning. Participant 1 and 2 revealed that using mobile device is completely different from studying an instructional video and posting and answering related questions using the IBOX platform.

Participant 3 noted that even when students appeared comfortable with computers, they were not ready to use technology for learning. The reason behind this was that some students were not oriented adequately to work in a technological teaching environment; they remained confused about how best to learn in using technology.

Participant 4 also added that "the idea of changing from the traditional classroom setting of teaching to blended learning approach of teaching initially created concern for some teachers and it took a while before they saw

its relevance". According to Participant 5, the ability to use the potential of electronic-learning remained difficult, because, for most students, the use of this type of technology was not consistent with their predominately hands-on routines.

Participant 6 also noted that students struggled when teaching with technology because the course content was substantial and the practical sessions still had to be accommodated alongside for students to understand. Participant 6 further noted that although, he spent extra time designing his blended learning courses, he

> "*ended up with the face-to-face elements running independently of the online materials and this therefore increased the workload".*

This view was supported by Participants 7 and 8 who were apprehensive about the additional workload involved in preparing teaching lessons using technology. The teachers indicated that they did not anticipated the initial time and effort that was required in preparing learning materials and this caused frustration. Preparing for both lessons, that is teaching using the traditional way without technology and using technology.

Participants 9 and 10 also revealed of not having access to Internet, poor network infrastructure and limited resources due to the demand for devices.

It can be concluded that the major factors that hinder teachers' use of technology in teaching were poor Internet network, additional work load in preparing for blended learning lesson and both teachers were not ready to use technology for learning. This view is supported by Harris and Greer (2016) and Rehmat and Bailey (2014) agreed that integrating technology into lessons

is a challenge for teachers with insufficient ICT skills. Winstead (2017) also concluded that teacher's workload associated with the use of technology for teaching is a challenge for most teachers. A study conducted by Ndibalema (2014) also asserted that some teachers would actively resist using technology in teaching when they are not comfortable with it.

Chapter Summary

This chapter investigated the perception of teachers on the use of IBOX platform to support teaching. Specifically, the study revealed that teachers who used videos from the IBOX platform for teaching have positive perception about its use to engage students. Similarly, the results revealed that the use of blended learning technology in teaching increased students' performance.

Finally, it was concluded that the major factors that hinder teachers' use of technology in teaching were poor Internet network, additional work load in preparing for lessons and teachers not ready to use technology for teaching.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

Introduction

This chapter presents a summary of the findings, conclusion and outlines recommendations including areas for further research.

Summary

The study investigated the impact of blended learning on students using IBOX platform: Evidence of Adu Gyamfi Senior High School. Purposive sampling was used to select the teachers who use the IBOX platform in teaching. In all ten respondents were selected for the study. Qualitative approach was employed which was underpinned by inductive logical reasoning. Conclusions from relevant related literature were captured along to authenticate the findings of the study. The summary of the findings are presented as follows:

The study revealed that teachers who used videos from the IBOX platform for teaching have positive perception about its use to engage students.

The findings of the results revealed that the use of blended learning technology approaches in teaching increased students' performance.

The results of the study concluded that the effective way to integrate blended learning technology in teaching is to use discussion and demonstration methods.

The study also indicated poor Internet network, additional work load in preparing for lessons and teachers not ready to use technology for learning as the barriers hindering the integration of the IBOX platform in teaching.

Conclusions

The following conclusions were drawn based on the research questions that were set:

It can be concluded that majority of the teachers appreciate the benefits of using blended learning technology to aid their teaching. The teachers felt that this form of technology brought the courses alive and allowed students to use the technology to understand concepts and aid collaboration among students.

However, they noted the challenges they faced in developing their courses to integrate technology in it using the IBOX platform. Such challenges include poor Internet network, additional work load in preparing for lessons and teachers were not ready to use technology for teaching.

Recommendations

From the summary of the major findings of this study, it is recommended that:

It was revealed that some of the teachers feel reluctant in using the IBOX platform to support their teaching, therefore it is recommended that they encourage such teachers and teachers who use the IBOX should use team teaching and peer coaching to support them.

It is also recommended that Ghana Education Service should allow teachers who are not comfortable using blended learning to visit each other's classrooms to observe colleagues who integrate technology in their teaching.

The school authorities should organize in-service training to teachers to address their varying needs for ICT and blended learning development. The need for appropriate technological orientation to the IBOX platform must be considered for both students and teachers.

A robust technology-driven infrastructure should be provided by the Government of Ghana to support blended learning to address concerns about Internet connectivity, server speed and stability.

Suggestions for Further Research

It may be necessary for further research to be conducted on the challenges involve in moving teaching methods from face-to-face to on only online platforms.

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APPENDIX A

CONSENT FORM FOR PARTICIPANT'S PERMISSION

Title of research project: The impact of blended learning on students using IBOX platform: Evidence of Adu Gyamfi Senior High School.

I ……

Hereby voluntarily grant my permission for participation in the project as explained to me by Mrs. Francisca Appiah (Master of Education in Information Technology). Participation will include an in-depth individual interview. I agree to interviews being tape-recorded.

The nature, objective and implications of the project have been explained to me and I understand them.

I understand my right to choose whether to participate in the project and that the information given will be handled confidentially. I am aware that the outcome of the study may be used for the purpose of publication or conference presentations.

I understand that am free to withdraw from the study at any time.

Upon signing of this form, I will be provided with a copy.

Signed: …… Date: …….

Researcher: …… Date: …….

APPENDIX B

UNIVERSITY OF CAPE COAST

COLLEGE OF DISTANCE EDUCATION

Interview Guide for Teachers

The purpose of this interview guide is to gather data for the research on the topic:

"THE IMPACT OF BLENDED LEARNING ON STUDENTS USING IBOX PLATFORM: EVIDENCE OF ADU GYAMFI SENIOR HIGH SCHOOL".

Thank you for participating in this interview which will take about 1 hour and will include ten questions regarding your practices and processes using blended learning as an instructional strategy to improve academic performance. I consider you to be an expert at your work so there are no wrong answers to any of our questions. Please feel free and 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 using blended learning.

Do **you** have any questions or concerns before we begin? Then with **your permission**, we will begin the interview.

What is your age?

Gender?

How long have you been a teacher at Adu Gyamfi Senior High School?

What subject(s) do you teach?

How long have you been using blended learning at your school?

Did you receive training for the implementation of blended learning?

Based on your years of experience teaching in a face-to-face environment, what are the major differences (if any) experienced?

Based on the types of activities and resources that are offered in the blended learning, what do you consider to be the most impactful?

Following up on your responses to the above question, how did you incorporate technology with your face-to-face instruction?

Probe: What resources did you use to infuse blended learning in your teaching?

What are the strategies you use to integrate blended learning in your teaching?

In your opinion, how do you think the processes and practices you used in your blended learning courses affect student performance?

Probe: Describe any influences your use of blended learning had on your students' performance?

Consider your experiences in teaching using blended learning, what challenges did you encounter you believe may have hampered its use?

Probe: What suggestions would you recommend for improving the program in your school?

Thank you for participating.

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