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INTEGRATING THE USE OF ICT INTO TEACHING AND LEARNING IN THE TEACHER TRAINING PROGRAM IN THE GAMBIA

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Summary:

Information and communication technologies (ICTs) are increasingly relevant in school classrooms. As a result, the growing classrooms succeed in meeting the changing needs of students, and Gambia College is in a high position in this regard.

The 21st-century classrooms are significantly different from the 20th-century classroom, and the concept is becoming more important because of the need to adapt to the reform of teaching approaches. In the current qualitative study, the data collected in a structured interview is open-ended questions. The procedure is carried out in an unfolded way, the recruitment and direct observation of the participants, and then the interview. Respondents' transcripts were analyzed using thematic analysis of 12 respondents, reflecting a rock-bottom picture of ICT integration and used in teaching at Gambia College.

The research shows that the integration of ICT and use is generally linked to traditional teaching approaches. Most of the barriers are due to the lack of available resources. ICT is not integrating properly in the teacher training program to making efficient use of technology in the classroom. The advantages of ICT depend on the learning approach used, the attitude, belief, and skills of the teacher, and the availability of teaching and learning support.

Keywords: ICT integration, competence, teaching, learning.

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List of Abbreviations

Information and Communication Technology	ICT
The International Development Association	IDA
Global Partnership for Education	GPE
The United Nations Educational, Scientific, and Cultural Organization	UNESCO
Organization for Economic Co-operation and Development	**OECD**
Ministry of communication and information Infrastructure	MOICI
International Telecommunication Union	ITU
Connect-a-School-Connect-a-Community	CSCC
United Nations Development Programme	UNDP
Rural Community Information Centers	RCIC
Primary teacher certificate for Primary Schools	PTC
Higher teacher certificate for secondary schools	HTC
The United Nations Children's Fund	UNICEF
Compact disc read-only memory	CD-ROM
Computer Assisted Learning	CAL
Computer Based-Training	CBT
Computer-Assisted Instruction	CAI
Learning Management System	LMS
Web-Based Instruction	WBI
Technology pedagogy and Content knowledge	TPACK
West African Secondary School-Leaving Certificate Examinations	WASSCE
West African Examinations Council School Certificate	WAEC

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1 Introduction

In the 21st century, the value of human resources is a critical success factor for every country. The push toward globalization calls for a dramatic shift in the perspective on education methodology. In the education sector, the importance of information emphasizes the importance of ICT integration (Ratheeswari, 2018). Most notably, the transformation of learning and technology requires a change from traditional methods, where many learners are confronted by a textbook to a system that allows students to learn through digital devices, such as computers and the Internet (Apergi, Anagnostopoulou, & Athanasiou, 2015, p.1).

Chan and Holosko (2016) describes Information and Communication Technology (ICT) as a diverse collection of communication technology tools that are used to convey information, distribute, store, and arrange the information. In order to enable people to obtain and use knowledge in their day-to-day activities, the ability to use ICT efficiently and successfully is considered necessary. Consequently, the effective use of ICT is necessary in today's information society and forms a major part of most teaching approaches (Almerich et al., 2016). Information and Communication Technology in education is divided into two methods: use of ICT for education and ICT in education. The use of ICT for education means ICT for teaching purposes. Use of ICT in education includes using traditional components of ICT for practical use of instructional and learning processes (Biddix et al., 2016; Murati & Ceka, 2017). ICT is seen as an influential and powerful tool for transforming and improving education (Fu, 2013, p.112).

Jabaka and Danbaba (2014, p. 3) believed that the ability to use ICT effectively has now become an essential part of education for all and a decisive factor for the growth and progress of all societies.

Alternative education and training practices have been established in the new economic and technological environment. The widespread use of the new technologies is likely to "provide collaborative learning opportunities between teachers and students and" thus offering them "more opportunities to improve problem-solving skills, in order to think and achieve active learning (Apergi, Anagnostopoulou, & Athanasiou, 2015, p. 5).

In order to prepare for the new information society that adopts the technology, students, and teachers will function as a team to generate awareness and face collective knowledge, this response implies in which standard creative methods are cultivated, and artifacts are incorporated. Therefore, it is essential to understand some of the fundamental principles of our cognitive system to understand how people are taught. Human memory does not function like a videotape or a scanner. Instead, we continuously construct our environment's mental models (Avidov-Ungar and Forkosh-Baruch, 2018).

In either public or private schools in the Gambia, ICT use is limited in teaching and learning. Most educational ICT projects have been funded by donors from international organizations, such as the World Bank Association for International Development and Poverty Reduction, Global Partnership for Education (GPE), and The United Nations Educational, Scientific, and Cultural Organization (UNESCO) and not by the Gambia government. The national provision of ICT and internet access are significant impediments to ICT initiatives on a large scale.

The current curriculum, which in 2002 began revision by grade-level cycle, has not yet been modified to support ICT use. The student assessment system has not yet been modified to reflect the new curriculum or technology though such efforts will most likely be undertaken in the next several years. The efforts of the previous government have not primarily focused on ICT integration into the Education sector access to the provision of hardware, software, connectivity, and resources.

There is little coordinated support for teacher's ICT use, and most ICT use in schools occurs in computer labs (IT classes). However, these issues can only be addressed through the integration and implementation of Gambia's national educational ICT strategy.

The skills demand people within the abilities to work, citizenship, and self-actualization in the 21st-century is very different from the 20th-century. Primarily because of the emergence of very state-of-the-art facts and communications technology. For instance, the forms of work done with the aid of human beings as opposed to the styles of hard work completed through the manner of machines are usually transferring as computer structures, and telecommunications make more significant their abilities to carry out human responsibilities.

There seem to be many private initiatives on short basis, from international charitable foundations or other types of organizations donating computers to public schools. However, the scarcity of research and evaluation on education in the Gambia signifies a missed opportunity to begin developing a national information base society, not merely touching ICT in education, but how these resources and approaches are to be realized in line with the Gambia's socio-economic development and develop the national strategic goals for the use of ICT for teaching and learning.

Teachers play a decisive role in the implementation of ICT resources because unless teachers comply, ICT will not be integrated. Teachers eventually decide to use ICTs in the teaching process and how they can be applied (Suárez-Rodríguez, Almerich, Orellana & Díaz-García, 2018, p. 1166). Thus, ICT skills training is essential for the integration of ICT into teaching at the School of Teacher Education, Gambia College. If more teachers can use basic ICT tools, there will be more integrated ICT activities in the classroom.

1.2 Statement of the Problem

There has been a general desire in the Gambia to develop the use of ICT in education. However, studies suggest that three significant obstacles, such as gender inequality in access to ICT, high attrition of teacher's ICT skills, and heavy reliance on donor's ICT funding (Kristiawan & Muhaimin, 2019). Moreover, many of the teachers are overwhelmed by technology and stay in traditional teaching styles (Ozdemir, 2017).

Teachers do not often use ICT tools such as Microsoft Office and multimedia presentations to engage and inspire students. The unfrequented use of PowerPoint for presentation is common in classrooms, rather than integrating ICT. Besides, ICT resources such as social media, email, and Msn Messenger are not widely used to enable chat to carry learning outside the classroom. Teachers ' do not have a strong commitment to learning for the successful integration of ICT use. Teachers 'lack of skills understanding ICT in the classroom, lack of resources, and desire for educational reform by school and policymakers seem to be major obstacles to the introduction of ICT in schools (Kristiawan & Muhaimin, 2019).

The Gambia Government, through the ministry of education, has initiated various programs promote through partnerships to encourage ICT use in primary and secondary schools. Ministry of communication and information Infrastructure (MOICI) in 2009, launched The Pan-African E-Network in the Gambia in a partnership with India's Government to provide satellite distance learning education (VSAT). A project funded by the International Telecommunication Union (ITU) in partnership with the Ministry of Basic and Secondary Education and the Ministry of Information and Communication Infrastructure established a Connect-a-School-Connect-a-Community (CSCC) in Basse, Farafenni, and Brikamaba. Distance education elements are installed at the University of Gambia, and Indian professors teach at Indian universities and institutions (Ministry of Basic Education and Secondary Education, 2019).

In 2014, the Ministry of Information and Communication Infrastructure supported by UNDP developed a Rural Community Information Centers (RCIC) in Mansakonko, which had a generic copy of the CSCC. However, this was particularly the case for communities where primary and basic ICT services are scarce. Besides other programs, the Center offered more medium ICT practice, including cell phone repairs (Connect a School, and Connect a Community in The Gambia, 2019).

Traditional teaching methods continue to be used in primary and secondary schools in the Gambia for classroom instruction. The teacher education program needs to be reorganized to tailor it to the production of ICT teachers who are competent and can work with new information and communication technology tools to overcome current teacher training programs in education for technology and pedagogical training at this fundamental level of education. Since many teachers lack the resources and means to deal effectively with Sub-Saran African students' specific cognitive needs, most of the students face a crucial lack of access to learning environments that Western curricula have been enjoying for cognitive growth and self-learning skills.

1.3 Objectives of the Study

The objective of this study is to investigate teachers' integration of ICT and usage in teaching and learning, the basic competencies, and use.

1.4 Research Questions

This study aims to answer the following research questions:

Q1) How do teachers in the Gambia College integrate ICT into the teaching and learning process?

Q2) How do personal and contextual factors influence the use of ICT in the teaching and learning process?

1.5 Justification of the Study

This study aims to reflect the integration of ICT by teachers' competences and use in the teaching and learning process at the school of education, Gambia College. It is believed that if the research question is properly discussed and communicated in a clear voice, it will provide information for decision-makers and serve as a model for them to call for action.

1.6 Scope and limitation of the Study

This research covers the integration of ICT in the teacher training program, Gambia College. It focuses on teachers' skills and use of ICT in the teaching process. The study is limited to the respondents, including teachers' students and teachers' instructors who have had experience at the College. It is the leading qualified teacher training for primary school teacher certificate (PTC) and secondary school teacher certificate (HTC) in the Gambia.

1.7 Significance of the Study

It is believed that this research will sound the alarm bell on the significance of teachers' technological and pedagogical competencies, which are essential for teaching and learning in the 21st-century classroom. These competencies include a high degree of understanding, self-confidence, ability, personal arrangements, sensitivity, and willingness to properly incorporate certain combinations. ICT competence is the awareness that teachers in their clinical practice may use technology. Danner and Pessu (2013) underlined the vital need for ICT skills of teachers, including:

- Skills in the personal use of ICT
- Mastering a range of educational paradigms using ICT
- Use ICT as a resource for education
- Mastering a range of assessment paradigms based on ICT use
- Understand the policy aspect of ICT use.

1. 8 Thesis Organization

The study is organized into chapters one to six.

Chapter One: Introduction

This chapter discusses the introduction of the study, the problem statement, the research objectives and questions, the scope and limitation, and the significance of the study. It also involves the design and structure of the study.

Chapter Two: Literature review

This chapter discusses theoretical literature from various sources to put this study within the framework of previous research. This review includes the integration of teaching and learning of information and communication technology (ICT). In the case of teachers playing a pivotal role, the process of integrating ICT is inevitable. This research focused on teachers' competencies in ICT and the uses of ICT in technological and pedagogical use, personal-professional, and with the students in the classroom. Explore the processes of education transformation, teacher's beliefs, and attitudes towards the integration of ICT.

Chapter Three: Theoretical Framework

This chapter provides the theoretical framework for this research. The model of a basic skill model established by Almerich, Orellana, Suárez-Rodríguez, and Díaz-García (2016), technological and pedagogical competences, technological competences affect pedagogical competences. The relationship between both uses, personal and professional use factors, is developed with Sang, Valcke, van Braak, Tondeur, and Zhu (2011)'s basic model on ICT use, showing that teacher support serves as a predictor of class use with students.

Chapter Four: Methodology

This chapter discusses the methodologies used in the research, including background of the study, research design, research instrument, sampling size procedures, data collection, ethical considerations, instrument reliability, and instrument validity.

Chapter Five: Data Analysis Technique

This chapter demonstrates the Thematic analysis, familiarization with the data, generating initial codes, major theme and sub themes, results, pedagogical competences, personal and contextual factors, and technological competences.

Chapter Six: Summary, Discussion and Recommendations

This chapter provides a review of summary, discussion conclusion and recommendation of this study.

2. LITERATURE REVIEW

2.1 Introduction

A systematic and thorough analysis of the relevant literature will be undertaken in order to place this research in the context of previous studies. This research aims to break down the critical factors and theories of study and its intersection. This research focuses on teachers' integration of ICT and use in teaching and learning in the Gambia and places an overview of Sub-Sahara Africa and other developing countries' paradigm.

Skinner is a behaviorist and an American psychologist whose perspective has been deeply shaped by educational software that can trace the significance of ICT to the early 19th century. According to Skinner (1938), people will learn more effectively when the climate is carefully regulated. He introduced the operating (behavior) conditioning theory, which claimed that: "If the occurrence of an operant is accompanied by the appearance of a stimulating stimulus, the force is increased" (Skinner, 1938, p.21). It provides a simple way of encouraging correct action by causing computers to be used as learning tools through rewards and inaction (Skinner, 1958). Skinner's paper "Teaching machine" has a clear approach to teacher education design. Bullard (2003) lambasted behaviorist as he concentrated on teaching the student to relay information, seeing him as a consumer of knowledge. He notes that "the method, now internationally recognized and fast-growing paradigm of the education system, must be rescued from the traditional behavioral approach to domination and cognitive constructivist approach" (Usun, 2009, p. 334).

According to Bada and Olusegun (2015), advocates view constructivism as a learning process in which people construct meaning based on prior knowledge and experiences. To evaluate potential teachers in the training academy, they felt that it was necessary to go through constructivist learning to establish positive beliefs about constructive methods, which is crucial. Constructivists find the student as an active participant in structuring the learning

experience in contrast to the behaviorist view. Bullard believes that using the teaching process will produce a new computer teaching method, which constitutes a shift from teacher-centered methods to a learner's teaching method.

Lindberg et al. (2016) proposed that the positive use of ICT would enhance learners' critical thinking, facilitate small-group activities, and encourage collaboration between students and teachers. The transition from web development to web development 1.0 to web development 2.0 and now to web 3.0 is an example, Gerstein (2014), believing that learning will change from education 1.0 to education 3.0. The Internet has become an important theme in most communities worldwide.

2.2 Pushing the Barriers

Gerstein (2014) and Blaschke, Kenyon, and Hase (2014) have argued that as time is ready for education 3.0, we also find ourselves in a perfect storm of free, online resources, where tools are available in order to create and share information and network opportunities. The researchers also suggested what keeps school administrators and teachers from adopting an approach to education 3.0.Reasons include: "I do not need enough time," "I do not need enough space," "I need more time to learn "; "I need to teach in textbooks," "I need to teach to test"; I might lose control over the classroom;" "I have always been teaching in this way effectively." They argue that these are the signs of a fixed mentality, of educators becoming teachers in the Education 1.0 era purely. Many teachers are forced into this teaching paradigm. However, the reality is that these are external barriers that put most of the blame for resisting change outside the teacher's responsibility. The result is a persistent attitude of learned helplessness, "I cannot improve because the process will not allow me to change." Educators often create barriers for themselves that do not exist. "Talking to them" or insisting on specific changes often creates more resistance walls increasingly.

Although research has demonstrated the advantages of ICT use in the classroom, the remaining obstacles or difficulties (Tuba & Rana, 2015). The study showed that the critical challenges associated with ICT use are student freedom of movement, students with disabilities, and attention to standardized test results. Many such difficulties can be solved through more active group activities and enough learning tools.

Ertmer and Ottenbreit-Leftwich (2013, p. 177) distinguished barriers as first-order, which are external to the teacher (i.e., resources, training, support) and second-order barriers, which are internal (i.e., attitudes, beliefs, knowledge, and skills). Researchers have since outlined many barriers and contributing factors that influence teachers' use of ICT in the classroom.

Fu (2013) highlighted potential challenges, including poor technological ability to use ICT in school environments, insufficient teaching guidance, lack of timely teacher input, and reduced contact with colleagues. Subsequently, the author focused attention to the value of teacher access and effective communication, as well as the development of podcasting and online meeting resources. Improve classroom students with learning disabilities and improve the efficiency of the use of ICT. Integrating technology into teaching will promote student learning (Aslan, 2016).

Several strategies to deal with these challenges exist. The integration of educational technology will improve student learning (Gil-Flores et al., 2017). Many approaches have been employed to overcome these challenges since the schools are encouraged to provide technology-related professional development programs to upgrade teacher skills and awareness and providing technical assistance where appropriate (Gil-Flores et al., 2017). Semerci and Aydin (2018) contends that technology is not only applicable to traditional forms of education. Teachers must not only learn how technology can enhance traditional teaching, improve traditional learning, and boost outcomes. However, to learn how ICT use can promote learning from a student-centric experience in classroom activities. In order to produce more attractive and effective

lectures and courses, teachers should use ICT more innovatively and effectively (Gil-Flores et al., 2017; Semerci & Aydin, 2018). Mir (2019) pointed out that teachers should solve the problem of integrating into the classroom. Teachers need to learn new teaching methods through teaching methods that adapt to current technology.

2.3 Shift from a Fixed to a Growth Mindset

When a fixed mindset often leads to learning powerlessness, a developmental and optimistic mindset undergoes a cognitive change when people feel their choice: people can choose, develop, improve, and become excellent. It is important to pay attention to where changes can be made and make minor changes in teaching. Small changes often lead to more significant, more systemic changes (Gerstein, 2014; Blaschke, Kenyon & Hase, 2014).

Nonetheless, the simple fact of the matter is not what the teacher, the administration, or the legislators want. It is in the best interest of the student. Students should be central to learning and not the content or the tests, not the standards, nor what we believe should be known and done by students. Teachers were not taught the test, to develop tests or worksheets, to comply with the standards of the pre-scheduled curriculum. Educators were first and foremost educators to teach students. The student must be central to all teaching efforts (Gerstein, 2014; Blaschke, Kenyon & Hase, 2014).

Plaza-de-la-Hoz, García-Gutiérrez, and Moreno-Mediavilla (2015, p. 3) argue that change requires changing the role of innovation, beliefs, and attitudes. However, technology itself has caused tremendous changes in the past to reform the education paradigm.

Furthermore, the authors posit that the information society creates a different area of professional activities with ICT as its educational tool. However, there are challenges to a new teaching profile that consider the advantages and/or disadvantages of ICT that teaching must contribute to human development, provide opportunity and join the school with our current

one, in need for technological competence and strategic innovation (Plaza-de-la-Hoz, García-Gutiérrez & Moreno-Mediavilla, 2015, November).

Sang, Valcke, Van Braak, and Tondeur (2010, p. 3) have described self-efficacy as "belief in one's ability to coordinate and implement action courses needed to produce achievements." The self-efficacy beliefs are viewed as essential conduct moderators and, more notably, behavioral changes. Bandura (1977) pointed out that self-efficacy is closely related to different forms of practice. Thus, in this sense, we reflect on the teacher's self-efficacy.

Several researchers have noticed that teachers play a crucial role as the primary change and resistance factor for innovation. The digital skills of teachers, their pedagogical skills, the belief of teachers in new technologies, the profile of the education team under these technologies, and the responsibility to foster collaborative learning (Ertmer & Ottenbreif-Leftwich, 2010, p. 258) thus we distinguished from interlinked areas of particular relevance in recently published. Hargreaves (2010, p. 2-3) suggests that reform in education is not merely a technological process in management effectiveness or a cultural one of comprehension and participation. Education is the most significant gatekeeper of opportunities and a reliable distributor of life opportunities. The interpretation of education either as a socially divided or culturally distinct society will often benefit certain classes and interests over others. It is and should be a political and moral battle. Generalized educational transition approaches based on its economic and cultural dimensions seem to neglect the basic political elements of the cycle of change.

2.4 Teachers Quality

Makori and Onderi (2013) pointed out that some other researchers believe that an award-winning teacher is a key factor in providing quality education. Hence, the growth of the country's workforce depends on the quality of its well-qualified teachers. The International Institute of Educational Technology (2007) emphasized the importance of teachers in developing human resources in the country. In every effective learning and teaching cycle,

high-quality teachers are crucial factors. Their achievement, social skills, and their job opportunities provide a more extensive range of opportunities for learners.

Gardner (2011) argues that teachers have a pivotal impact on their students' learning and have ever been claimed by pedagogical research, thus underscore the significant influence of teaching on student learning. Besides, if the education quality is to be improved, there is no way without raising the quality of teachers in which in turn must place great emphasis on teaching practices and teacher education system in alignment with 21st-century requirements on the global stage.

The 1998 report on world education mentioned the importance of teaching and learning conditions, and teachers were the main drivers of the relevance of quality education and popularization. The UNICEF (2000) affirmed these key roles of teachers in similar developments. They are catalysts for reforms involving the decision-making process.

Teaching and learning have established paradigm shifts in teaching methods and pedagogical goals that enable students to learn effectively in the 21st century. Schools have adopted other approaches to teaching, such as the solution to the sustainable development of the education sector, student-centered learning using the ICT requirements to be incorporated into the curriculum (Emaliana, 2017). However, in the Gambia, the school's curriculum and teaching practices are still mostly traditional methods centered on teachers. The learning content is widely printing materials, and the delivery system is through the traditional classroom, thus requires the shift to transform to student-centered learning, as the opportunities to improve students' analytical skills, problem-solving skills, self-directed learning, reflective learning. It is the way to meet the learning outcomes that satisfy all the objectives of the learning process. Khan and Mahmood (2010) note that teaching is an art that can be perfected through training and practice. Makori and Ondigi (2014) also note that teacher training efficiency influences the

quality of teaching. Therefore, it can be argued that quality training is necessary and that a teacher is equipped with technical knowledge and qualified for the teaching-learning process. Mobegi and Ondigi (2011) pointed out that well-trained teachers are essential for quality education. The Joint UNESCO / OECD report (2001) also underlines that "skill is an important element of quality in education for better-trained teaching." UNESCO and OECD also mention that' teaching experts' should be supplemented by pedagogical skills.' (Mobegi & Ondigi, 2011).

Ayeni (2017, p. 168) argues that teachers need to choose appropriate methods to enable an efficient learning process. An effective teacher must have a good understanding of the topic. The instructor must not direct the approach, but interaction with students and learning materials, allows the learner to develop problem-solving skills by making him or her an active participant. When students can work with peers, share ideas and experiences, they become active and become more confident.

2.5 Teachers Professional Training

Teacher training and professional development and promotion strategies are regarded as essential. However, in the Gambia, the current training standards do not satisfy teachers. Teachers who have received pre-service training feel that after qualification, there are no opportunities for further development. Unqualified teachers hope that training and professional standards can be improved. A slow and inefficient promotion system is hampering professional development that demotivates teachers who work over a long time (Wyatt & Ončevska Ager, 2017).

Makori and Onderi (2013) conduct quantitative research to investigate the perception of secondary school leaders of high school teachers' qualifications and pedagogical skills and their effectiveness in teaching in Kenya. Most highly trained teachers are more academically

qualified and are considered more effective by supervisors and administrators, including those who join the teaching field Makori and Onderi (2013, p.121). Whereas, poorly qualified teachers have more challenges and are less professional by evaluators and peers and leave early in their careers at much higher levels. Better educated teachers are the basis for ensuring high-quality teachers educated in all classrooms in traditional or innovative courses.

Johnes et al. (2017) also agreed that teaching efficiency improves the quality of education. The researchers reiterated that secondary school teachers and training programs are affected by economic, political, and social factors worldwide. Besides, there are four teacher education programs in different countries, including teacher training, pre-service training, in-service training, and continuous professional development (Taneri, 2017).

However, these have advantages and disadvantages, such as the strengths of a school, are less costly, more sensitive to teaching needs, and provide better training in pedagogy. Its disadvantage is that it is not conducive to the development of basic knowledge for student teachers, which is essential for secondary school teachers (Taneri, 2017).

Similarly, teacher training programs are faced with some challenges. Students at educational colleges may not have in-depth knowledge of the subjects to be taught, mainly in which the teaching status is low, and the educational standards of teacher training entrants are weak. Sometimes, the subject's material takes up to eighty percent (80%) of the teacher's time (Allen & Hancock, 2017).

Research has shown that for primary school teachers, school-based teacher training has only been practiced, where it was used as the initial training of teachers for teaching unqualified, but experienced teachers. As such, the pre-service teacher education program is the most common type of secondary teacher training program in both developing and developed countries (Makori & Onderi, 2013).

Nevertheless, the authors continue to posit that there is a difference in the system, including differences in the duration of the standard: implementation, control, and maintenance. Certain factors, such as space available in teacher education institutions, limits the existing pre-service teacher training programs, the high cost of more professional secondary education teachers, and the operation of the teacher training institution.

Zhou, Zhang, and Li (2011) also reported that attempts to integrate ICT have failed, and studies have shown that ICT use can improve teaching effectiveness through the implementation of ICT. The use of ICT enhances the conceptual understanding, problem managing, and teamwork skills in mathematics (Makori & Onderi, 2013).

Professional training enables teachers to play an active role in training learners of independent lifelong learners to adapt to the emerging needs of society for education. It also helps teachers to focus on the teaching process by interacting with the subject matter, curriculum content, pedagogical creativity, and sociocultural aspects of education. Effective education can make a teacher an excellent or high-quality teacher and make him or her have the most positive impact on academic performance or achievement (Makori & Onderi, 2013).

The authors continue to emphasize the importance of successful students, saying that "the future of a nation is born every morning in a classroom. This infant's future only takes shape and achieves its full potential in the hands of a" healthy teacher says," "no education system could be better than its teachers." In the education system, the teacher is the pin of the king. "The author claims that" teacher certification plays an important role in teaching, but it is more crucial in teaching technical education or training because the certified teacher will teach better than the untrained instructor.

It is also established by Canales and Maldonado (2018) that two teachers' attributes have made a large contribution to the academic achievement of students. Such factors contribute to the

academic achievement of students are teachers' mastery in subject matter and their teaching qualifications and experiences.

Makori and Onderi (2013) describe four factors contributing to a teacher's performance. These depend on teaching experience, training (in-service training), and methods as well as the teaching methods and knowledge for the subject and teacher's professional. Interestingly, the authors did not point out that pedagogical knowledge is a critical factor in teaching effectiveness. Even so, there is a progressive indication that a decent knowledge of pedagogy is an essential element in teaching successfully.

2.6 Teachers' Integration and Use of ICT into Teaching and Learning

The integration of ICT is not recent trend in education, it could be as older as radios or televisions. However, the integration of ICT has attracted educators' attention with the rapid growth of new technologies (e.g., online technologies). Technology should not be used because it is available or proved successful in certain situations (Hinostroza, 2018). Technology should be used to allow the process and improve learning, as improper technology can lead to disadvantageous effects. Approaches to ICT integration can be critical in addressing standard teaching and learning, in the context that involves considerable time and effort in implementing them. Many studies suggest that ICT is more common in educational processes than any curriculum reform or advancement (Hinostroza, 2018; Zhang et al., 2016).

Das (2019) also argued that ICTs could be distinguished into four different usages levels regarding learning and teaching. These usage categories are web-supplemented courses- which are the combination of the usual classroom time and activities with ICT tools, i.e., online course notes; teacher-student interaction and communication are done online and online resources to support course notes. Web-dependent course-students use the internet for essential aspects of their course, such as online discussion, online assessment, and online collaborative projects, and the usual classroom time remains intact.

Stratton et al. (2019) assert that two use of levels are online courses and the mixed-mode courses and expounds on the role of ICT in teaching and learning by noting that ICT has removed the idea of the distance from distance learning as online education is possible nowadays.

Bindu (2016) agrees with this by stating that through the flexibilities given by ICT, many learners find opportunities to do so, such as workers undertaking courses from their desktops were unable to participate in educational activities before. Bindu (2016) also added that online learning and teaching could promote relevantly and consistent interaction among teachers and students compared to what is available in traditional classrooms.

Using ICT helps students gain analytical and problem-solving skills. The advantages of using ICT include promoting group learning, providing versatile learning opportunities anytime, anywhere, and providing cross-cultural use opportunities (Barak & Levenberg, 2016).

Hernandez (2017) argue that ICT integration is complete with the smooth integration of all the basic elements of a program. In education, it is not essential to provide students with a set of websites or CD-ROM programs, take the students once a week to a computer laboratory, or use an interactive worksheet to incorporate ICT. ICT and other primary instructional elements such as contents and pedagogy are organized into a single entity within a properly planned ICT integrated lesson. Hermawan and Deswila (2018) believe that the goal of the can be accomplished; however, if some components are omitted from the ICT integration curriculum, it will somehow reduce the curriculum consistency.

Similarly, if the technology is used seamlessly to support and expand course objectives and engage students in meaningful learning, then technology is integrated. It is not something that one person does alone; it is part of the daily activities in the classroom for the reasons mentioned above, in the education sector of the Gambia. The ICT must be characterized as a consistent integration of technology to promote and strengthen students' dedication to

meaningful learning and curriculum goals. It is more of a process rather than a product (Hernandez, 2017). Effective ICT integration should focus on pedagogy design by justifying how technology is used in this way and why.

Effective ICT integration has the potential to engage learners. Additionally, ICT can support various types of interactions in the learning environment: learner – content, learner-learner, learner-teacher, and learner-interface. These interactions make the learning process more interactive and learners more active and engaged (Hermawan & Deswila, 2018).

Hernandez (2017) argued that education technology provides a groundbreaking commitment to transform the standard of our schools' teaching and learning. This response is the catalyst for change, but that does not necessarily mean that we need more computers in our classrooms. Technology requires a method as well. The attempts to enhance education have all too frequently contributed to the impractical isolation of technological processes.

Integrating ICT into the teaching and learning process is a growing field with a range of meanings according to various perspectives. A widespread opinion argues that ICT systems should be implemented in an integrated manner, as well as a concrete model to be developed for teachers to improve student learning through the integration process. Centered on the principle, "learning should be improved through the integration process (Zhang et al., 2016).

It is believed that these may be guidelines to the schools that include not only primary and secondary schools but also teacher training schools in schools and universities, instructors, and students in the teacher education programs, as well as classrooms at schools and lecture and conference rooms at colleges and universities and adopted by ICT-enhance Teacher Standard for Africa (ICTeTSA, p.19-27).

Ng, Miao, and Lee (2009, p.71) postulate that the model of ICT integration of teachers and students' encounters and conducts in learning and using ICT can be divided into the following stages: In the very first significant hurdle, teachers and students are discovering new ICT

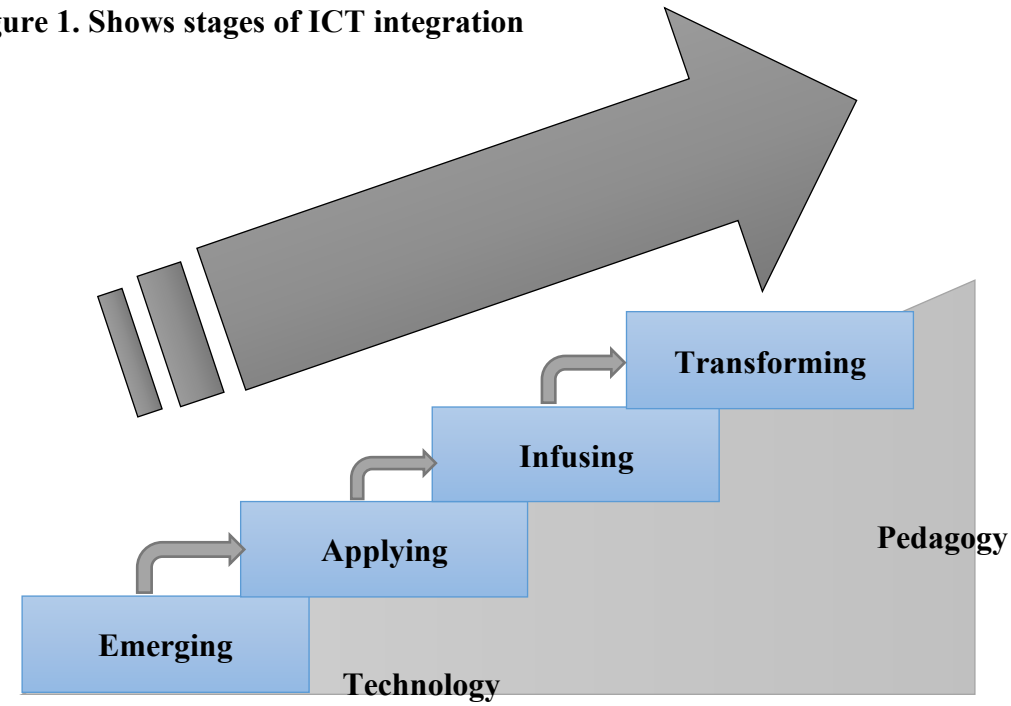
resources, their roles, and uses, and concentrating on ICT literacy and core competencies. It is found that ICT resources in the development are being released into the emerging stage.

The second stage involves learning how to use ICT tools and beginning to make use of them in different disciplines. It includes the use of both general and ICT applications and is related to the ICT development model's application stage.

In the third stage, there is knowledge of how and when to use ICT tools to achieve a purpose, such as completing a specific project. This stage implies the ability to recognize situations where ICT will be helpful, choose the appropriate tools for at ask, and use these tools to solve real problems. It linked with the infusing stage in the ICT development model.

The fourth stage is when the learning situation is transformed using ICT. It is a way of approaching teaching with specialized ICT resources; thus, can be used to facilitate the transforming stage in the ICT integration pattern. Figure 2. in the following ICT Integration Stages illustrate.

Figure 1. Shows stages of ICT integration



(Source: Ng, Miao and Lee, 2009, p.71)

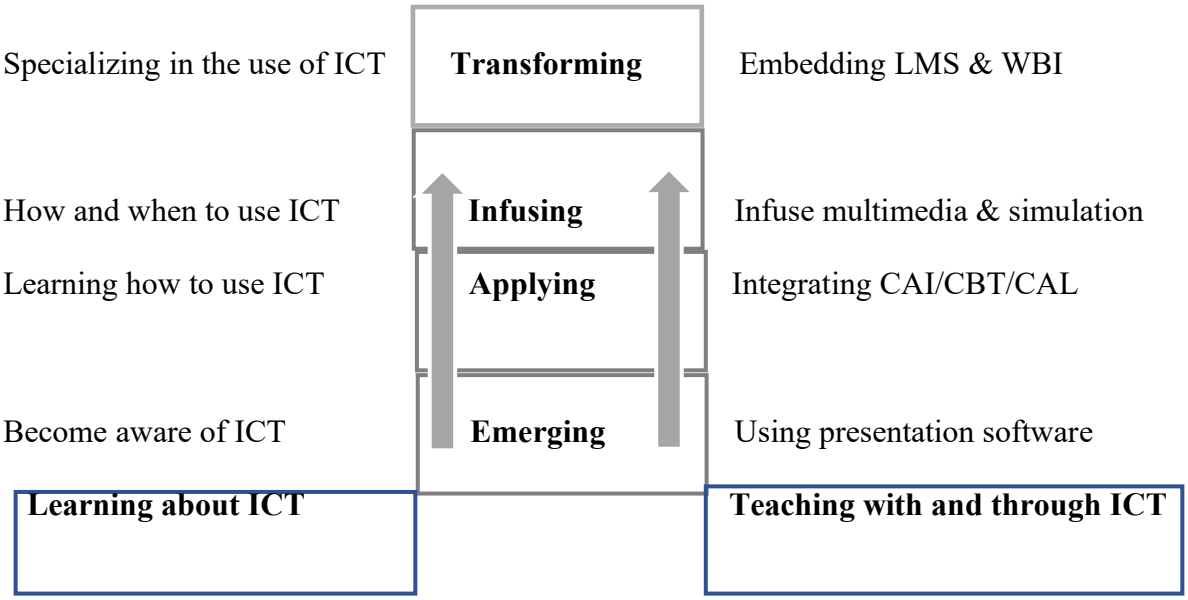
Figure 1. depicts the ICT integration process from the initial emerging stage into applying and then the infusing through to the transformation. Thus, they are primarily to achieve change in the ICT integration regarding technology uses into pedagogy.

The authors posit that progression through these stages is time taking. Moreover, the transformation of pedagogical practice requires more than ICT skills training for teachers. Too often, the approach taken to teacher training in ICT integration is based on computer literacy. However, this approach does not enable teachers to integrate ICT in their day to day activities and master ICT as a useful tool for teaching and learning.

A 2004 study conducted by UNESCO Bangkok of ICT integration experiences across six countries in Asia reports that the following "lessons learned" concerning approaches to teacher training in ICT integration:

- Training teachers on ICT related skills within the context of classroom objectives ensures the development of skills in the integrated use of ICT in teaching.
- School-based teacher training by more experienced colleagues from other schools or senior teachers from the Education to ensures teachers are trained in their workplace.
- Needs-based just-in-time learning and peer coaching to ensure further development of teachers' ICT and pedagogical skills is illustrated in figure 2.

Figure 2. Mapped ICT Integration stages into teaching and learning



(Source: Ng, Miao and Lee, 2009, p.72)

Figure 2 represents the process that starts with learning about ICT and teaching with and through ICT. The emerging step involves becoming aware of ICT and using presentation software. The Applying step is learning how and when to use ICT, such as integrating computer-aided instruction, computer-based training, and computer-assisted learning. The infusing step is how and when to use ICT such as multimedia and simulation software. Transformation is utilizing the use of ICT and embedding learning management systems and web-based instruction.

2.7 Using ICT in Education

Fu (2013) believes that students use ICT as an analytical learning tool to solve problems and provide solutions throughout the learning cycle. By using ICT, students can gain more knowledge and learning principles in a study that is open to them. ICT provides students with a new perspective in the domain of education, while it also proposes more productive solutions for different types of learning. Learners can conveniently use computers, tablets, personal digital assistants (PDAs), or iPads to access any form of text from beginning to advanced levels. More specifically, these e-books can contain a variety of reading applications providing a

reading-aloud interface, related vocabulary building exercises, reading and vocabulary skills games, and much more learning materials (Fu, 2013, p. 113). Students are also getting more interested in the practical use of technology (Ounis, 2016, p.1039-1040).

They reconstruct the previous knowledge and develop into knowledge through access to information and data, arrangement, and analysis. Using ICT lets students connect, communicate, and collaborate regardless of where they may be. For example, a teleconference classroom may invite students from various parts of the world to discuss a topic. They will be able to look at problems, discuss ideas, and create concepts (Deka & Jena, 2017, p. 1406).

Tallvid (2016) argues that effective teaching and learning use of ICT includes three main features: autonomy, ability, and creativeness. Autonomy means students should be able to monitor their learning through ICT. They are also more likely to communicate among themselves. Teachers may also encourage students to work in classes or with peers. Students will learn new knowledge through cooperation with ICT and have full confidence in the risks and errors of new information. Similarly, ICT makes teaching more versatile by allowing teachers to produce resources and control the content of courses rather than traditional classrooms (Serhan, 2009; fu, 2013, p.114; King & South, 2017, p.11).

Tuba and Rana (20015) found that teachers can promote the integration of technology through ICT if teachers can get the guidance, facilities, and technical support required by the setup, it will be easier for teachers to develop ICT classes. These teachers will play an essential role in improving the teaching systems, designing and clarifying new activities, and establishing computer labs by course specialists (Fu, 2013; Tuba & Rana, 2015, p. 467).

Fu (2013) pointed out that ICTs provide students with the ability to explore other materials beyond the course mechanism. They are using ICT and changing the connection between teaching and learning, the connection between teacher-student and information technology is

inversed. This connection increases students' confidence that they are capable of supporting teachers in the classroom with technical issues.

3 THEORETICAL FRAMEWORK

3. 1 Introduction

Suárez-Rodríguez, Almerich, Orellana, and Diaz-García co-authored and released the teacher's ICT integration model in 2018: competence and use. Although, the researchers did not find that the previous paper used the model to explain its rationality. However, given the insights that the model advances, the researcher takes the liberty of making use of the novelty it offers. The study pointed out that teachers need ICT ability and use to integrate ICT resources into teaching by the teachers' demands ICT competencies and use. Establish a framework that shapes the subsets of ICT competence (i.e., technological and pedagogical) at all levels of education, including primary, secondary and higher education, and determine how different personal and contextual factors influence these subdivisions (Almerich, Orellana, Suárez-Rodríguez, & Díaz-García, 2016, p.110).

3.2 A Basic Model of Integration of ICT by Teachers: Competence and Use

The authors argue that the model infers the dynamic relationship of competence and integration of ICT. In which technological competencies influence pedagogical competence and personal-professional use, while pedagogical competencies influence personal-professional use. Both pedagogical and personal-professional abilities influence the use in the classroom. Furthermore, the four dimensions of use and competence are affected by personal and contextual factors. Thus, the model of the relationship between teachers' ICT skills and the use of these teaching resources seeks to explain the interconnected process of integrating ICT into classrooms. Consequently, this model is a fundamental element in directing teachers' ICT training (Suárez-Rodríguez, Almerich, Orellana, & Díaz-García, 2018, p. 1165).

3.3 Why This Model?

The authors postulate that the ICT competency framework may be classified across three main groups. The first one provides a framework for teacher competence introduced by institutions such as the International Society for Technology in Education (2008) and the UNESCO ICT Competency Framework for Teachers (2011). The following standard consists of suggestions from the knowledge of technology in pedagogy and content (TPACK) developed by (Angeli & Valanides, 2005; Koehler & Mishra, 2005; Kabakci Yurdakul & Coklar, 2014). The third criterion is the result of several researchers' efforts to establish a teacher competency model. Positioning around the work of a handful of researchers in the following: in which the two specific sub-areas of teaching skills in ICT are regarded as technological and pedagogical competence (Suárez-Rodríguez et al. 2018, p. 167).

The way teachers work has a significant impact on technology and teaching variables, both of which are prerequisites for integrating ICT. Teachers' technological competencies are applied to knowledge and skills that help them effectively master technological resources for their teaching. Therefore, it includes the management and in mastering of Computer usage, basic computer applications, multimedia, educational software, and networks (i.e., information search, communication) (Almerich et al., 2016, p. 111; Suárez-Rodríguez et al. 2018, p.1167). Teachers' pedagogical skills include ICT, such as curriculum design and planning, and let teachers use knowledge and skills in their teaching processes. Thus, it includes the ICT-based teaching-learning guidelines, the organization of classrooms, and the development of a learning environment where ICT is integrated. Communication and involvement in initiatives and technologies focused on ICT, ethics, and legal issues resulting from the use of ICTs, with the educational community's parents and students (Almerich, et al. 2016, p. 111; Suárez-Rodríguez et al. 2018, p.1167).

3.4 Teachers' Competences in ICT

Almerich et al. (2016) suggest that the relationship between technology competence and pedagogy competence has not been adequately studied. Only a few pieces of research have dealt with the relationship between technological and pedagogical competences. More than that, the work focused more on technological competence and, to some extent, take the pedagogical skills second choice. Thus, it is required to investigate and determine the interrelationship between the two areas. (Almerich, et al. 2016, p. 113).

Factors that might change teachers' teaching practices are their competence in ICT as an essential element for ICT integration into the classroom. ICT competencies are the knowledge and skills that teachers need to acquire to integrate technology resources into their teaching practices, which have been brought to attention in the ICT literature (Suárez-Rodríguez et al. 2018).

Furthermore, the authors argue that the approach becomes problematic when teachers use ICT in their teaching practice, and it was discussed in the previous decade and supported by other scholars. Besides, the teachers' uses are known in this model as personal-professional and in the classroom with students. Personal-professional use applies to the use of ICT when students are not involved in the various tasks of their teaching practice. Thus, usage includes fundamental aspects such as the administrative and management activities that teachers are doing as a part of their teaching work, planning lessons, and developing educational materials to use in their teaching practice.

While in class, the use of ICT refers to the use in classroom practice, thus use serves as a tool for providing explanations, using technological tools with the student in the classroom, and including the resources in the curricula by developing environments in which ICT has been wholly integrated (Suárez-Rodríguez et al. 2018, p. 168).

3.5 Competences and Use by Teachers

The integration of ICT in the education system is critical for teachers. Thus, it becomes compulsory for teachers to be confident with using ICT while considering both technological and pedagogical competences (Ertmer & Ottenbreit-Leftwich, 2013, p. 178). It will then require the development of technological and pedagogical ICT skills, allowing teachers to incorporate these technological tools into their teaching (Almerich et al. 2016, p. 111). While teachers who feel competent including ICT in their teaching (Fraillon, Ainley, Schulz, Friedman & Duckworth, 2014, p. 180). These relationships between teachers' ICT skills and the use of educational resources in their teaching activities are essential to integrating ICTs.

3.6 Influence of Competences and Personal and Contextual Factors Relationship

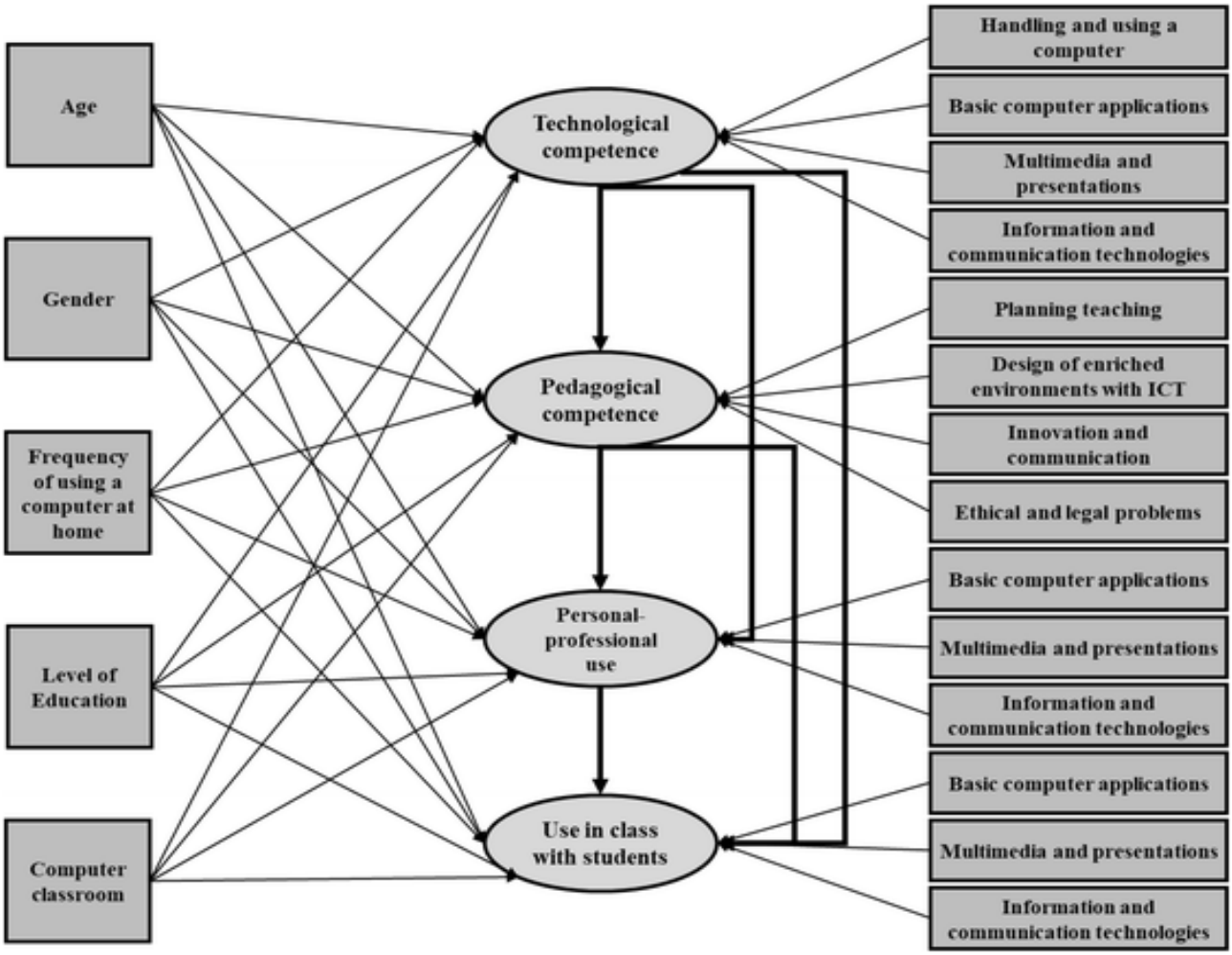
In recent years, various studies have been investigating the introduction of ICT into education. These studies establish a positive predictive relationship between teachers' ICT skills and student use. Nevertheless, each model encompasses various aspects of competence and dimension of implementation (Suárez-Rodríguez et al. 2018, p. 168). The authors indicated that the Department of Assessment and Accountability for the West Australian Department of Education and Training (EADETWA 2007) found that personal-professional use is the most decisive factor in teacher competence in ICT when the question is focused on the link between ICT competencies and the use of technological tools.

The authors point out that there is a close connection between ICT use in the classroom and teachers' ICT capabilities, which indicates that technology and teaching skills are predictive factors for ICT use in the classroom. However, the pedagogical aspect is more important than technology. Besides, drawing people's attention to gaining experience in ICTs means increasing the use of ICTs in the classroom.

This also found a strong link between both elements, and that personal-professional usage is more directly linked to the pedagogical and technological skills of teachers than their use with class students. Structured ICT skills and dimensions used to combine technological skills with personal-professional use and class-based pedagogical skills. There has been no further systematic research on this dynamic link between competence and dimensions in the structural relationship model (Suárez-Rodríguez et al. 2018, p. 1168). The integration of ICT into education is a complex system that incorporates many factors, as researchers have pointed out. It is possible to differentiate between the personal experiences of teachers and the external factors that usually affect them. Research on teaching skills and using gender-related ICT (EADETWA, 2007; Gil-Flores, Rodríguez-Santero & Torres-Gordillo, 2017; Sipila, 2014; Suárez-Rodríguez, Almerich, Díaz-García & Fernández-Piqueras, 2012). In relation to age (EADETWA, 2007; Suárez-Rodríguez et al., 2012; Frailon et al., 2014). Regardingthe level of education (EADETWA 2007; Liu, Ritzhaupt, Dawson & Barron, 2017) and access to computers at the workplace (O'Dwyer, Russell & Bebell, 2004; Liu et al. 2017) as factors of influence, among others (Suárez-Rodríguez et al. 2018, p. 1168-1169).

3.7 Structural Model of Competences in ICT and Use of ICT

This model reveals a dynamic correlation between competence and use. Technology competencies influence pedagogical competence and personal-professional use when pedagogical competencies influence personal-professional use and use in classrooms. Pedagogical and personal skills guide to use in the classroom. Personal and contextual factors influenced the four dimensions of use and competences. The basic model of the relationship between teachers' ICT skills and their use allows us to understand the dynamic process of incorporation of ICT into classrooms. Displays in Figure 3.



Source: Suárez-Rodríguez, Almerich, Orellana, & Díaz-García, (2018, p. 169).

Figure 3 Shows dynamic relationships of latent factors of technological competence, pedagogical competence, and personal-professional use and use with students in the classroom. While personal and contextual factors play an influential role over these factors.

The model proposes that the relationship between ICT competencies and use is structured into four potential changing factors. Technological competence and pedagogical competence form competence in ICT. While personal-professional use and use with students in the classroom makes the use of ICT. Toward the convolution of integration ICT, various personal and contextual factors (e.g., gender, age, frequency of use of computers at home, level of education,

and the use of computers in the classroom, etc.) are recognized influencing both competence and use. The relationship is formed in the model between technological competencies and pedagogical competencies, where technological competencies influence pedagogical competencies identified by Almerich et al. (2016). The relationship between the personal-professional use of influences in the classroom. The model was developed by Sang, Valcke, van Braak, Tondeur, and Zhu (2011). The authors suggest that the use of teacher support as a predictor in the class with students establishes the established relationship between technological competence and pedagogical competence of both types of use. In which both sorts of competence have an impact on both sorts of use. Studies conducted by the following researchers: From (2017) and Uerz et al. (2018) suggest that there is a correlation between technological competence and pedagogical competence, both of which have an impact on the types of use. It is based on several studies on the relationship between competence and the use of technological resources that have been previously (Suárez-Rodríguez et al. 2018, p. 1169-1170).

3.8 The Basic Dimensions of Teachers' Competences in ICT

From a technological point of view, the model considers the requirements for handling and using computers, installing hardware and software, and local communication networks (Intranet). Basic computer applications include word processors, PowerPoint, spreadsheets, and databases, which are necessary skills.

The pedagogical dimensions of competencies are considered in this model. The planned teaching includes the selection and design of course materials and the evaluation of technological resources. It also considers the moral and legal issues arising from the use of technological resources.

Designing an enriching environment with ICT includes designing learning solutions in different situations and creating an environment in the classroom by integrating ICT and use with students' as an evaluation instrument student with special education needs.

Participate in collaboration and exchanges with the education community and participate in research and innovation projects related to ICT.

Personal-professional use dimensions of this model considered skills in basic computer applications (e.g., processors, spreadsheets, and databases). Teachers can search for information on the Internet, email communications, online communication (e.g., blogs, forums, etc.), and interactive software presentations on audio-visual media.

The dimensions of usage with students in the classroom considered teachers' use of basic computer applications with students in the classroom as a word processor, spreadsheets, and databases. Search for information on the Internet, email communications, blogs, forums, and other online communications, web design, and other functions: multimedia presentations, i.e., educational software, and audio-visual media.

3.9 Personal and Contextual Factors

Almerich et al. (2016) pointed out that a complex process involving several factors is the main feature of comprehending ICT integration. Several authors support the view that there are certain factors that affect the integration of these technological resources. In what was described by the authors as distinguishing between the contextual factors surrounding teachers' factors and their personal factors (Almerich et al. 2016, p.114).

Research of ICT skills shows that variables, such as gender, age, computer frequency of use at home, education level, and computer availability at work, are important, personal, and contextual. Differences have been found at the univariate level, i.e., each factor separately. Moreover, the gender difference between males and females because males' teachers have

higher skills than their females (Almerich et al. 2016, p.114). It also reveals that younger teachers have higher levels of technological and pedagogic skills than older teachers. The frequency of using the computer at home will affect the teacher's skills. With respect to education, only non-university teachers have been considered. It indicates that competences in primary education are less than in secondary and higher education, but where they are similar and the use of computers in the workplace, a factor influence teachers' ICT competence. Besides, studies have identified that few studies have been conducted at the multivariate level. Those that exist emphasize that the relationship between different factors is complicated. However, it has been noted that univariate-level such as gender, teachers' ICT competencies clearly distinguish male teachers from female teachers. As the argument remains, it has discovered that female teachers are more strongly linked to pedagogical competences and male teachers are more closely linked to technological competencies. Correspondingly, the frequency of use of a computer element, on the other hand, influences technological competences.

Subsequently, age is not a significant factor in competences. However, it is noted the importance of computer skills, but not for teacher preparation, while age is not significant for computer use (Almerich et al. 2016, p.116).

3.10 Limitation

The author emphasizes the limitations of these studies and urges others to test the concept in other regions and countries. In order to verify and improve the model, it is necessary to implement the model. Beyond that, adding that the model uses personal and contextual factors means adding other primary variables to the model, such as beliefs, attitudes, barriers, perception of ICT as important to teaching, perception of the impact on student learning, the

context and policies of the educational center, training needs, and the self-efficacy of ICT in teaching respectively.

In conclusion, as per the proposed model, the authors emphasized that the competence of teachers in ICT is a key element in the use that teachers make of these educational resources, hence their significance in teacher training. The difficulty of bringing ICT into the classroom has been explained. Consequently, part of the teacher training plans must deal with certain issues where ICT teacher training is a relevant factor in securing effective programs (Suárez-Rodríguez et al. 2018, p.183).

4 RESEARCH METHODOLOGY

The study is designed to investigate the integration of ICT and use at the school of education, Gambia College, and chapter dealt with the methods used in the study. The overview includes the background of the study, research design, research instrument, sample size and procedures, data collection, ethical considerations, instrument reliability and instrument validity.

According to Yin (2012) there are three types of research designs: qualitative, quantitative, and mixed methods. Quantitative research tests a theory on the basis of assumptions, by analyzing the associations between variables. Qualitative research explores the problem through the experiences of others. Moreover, qualitative studies explore what happened or the meaning of the phenomena (Creswell, 2002, as cited in Blando, 2011). Mixed-method research comprises both qualitative and quantitative research.

This study utilized a qualitative method to research. Quantitative, qualitative, and mixed methods are used to conduct research (Zoellner & Harris, 2017). Researchers use qualitative methods to gain greater insight and understanding into a research phenomenon (Hammarberg, de Lacey, & Kirkman, 2016). A researcher identifies trends and patterns through a qualitative method (Albers, 2017). The qualitative method is a data collection process that generates nonnumerical data but depends on the interaction between data collection and data analysis (Saunders, Lewis, & Thornhill, 2015). The quantitative method is the systematic empirical investigation that uses statistical, mathematical, or computational techniques (Baillie, 2015; Yin, 2018). The quantitative method is not appropriate for this study because the purpose of this study is not to examine variables, characteristics or relationships. The mixed method is a research procedure that involves collecting, analyzing, and integrating quantitative and qualitative research in a single study to enrich the general findings of the study (Yin, 2018; Bester, Moll, & Simons, 2017). The mixed method approach is not appropriate for this study because the purpose of this study is not to collect and analyze empirical data for examining

variables' characteristics or relationships. Quantitative and mixed methods are not appropriate for this study because the purpose of the study is to explore strategies and practices in one organization.

Creswell (2016) suggest that qualitative research emphasizes the interpretation of meanings that participants bring into a social context, which underlines both its practical nature and its flexibility. Its practical significance is that it pays attention to the meaning created by the respondent during the interaction, and its flexibility is reflected in its efforts not to impose or patronize the respondent.

It does not have a predetermined answer, but researchers will go to the site to find the answer and often ask new questions. While quantitative methods seek to make predictions, probabilistic statements and generalizations, qualitative methods explore processes, how and why programs work or fail to work, and on unintended and unanticipated outcomes of programs' (Fisher, Laing, Stoeckel & Townsend, 1991). Where quantitative researchers examine causal relationships, qualitative researchers seek instead illuminations, understanding, and underlying patterns in the events confronting them.

In qualitative research, flexibility, sensitivity to research subjects, and contexts, as well as sound judgment, is crucial. These affect all stages and strategies of how they behave. Examples of qualitative research methods include interviews, focus groups, direct observation, and content analysis.

In general, qualitative research is considered appropriate in situations when it is not possible to conduct quantitative designs. However, acutely, the qualitative design is more appropriate in that an in-depth description and analysis of the event or social phenomenon are needed, and the event is occurring or developing (Babbie, 1986).

In this study, the following research questions have been formulated considering the features of a qualitative research question. An open-ended question allows respondents to answer

questions in the open text so that they can answer based on their comprehensive understanding, feelings, and experience. Research questions are exploratory design carrying to enhance the understanding of people's cultures, beliefs, values, human experiences, and situations, as well as to develop theories that describe these experiences.

Q1) How do teachers in the Gambia College integrates ICT into the teaching and learning process?

Q2) How do personal and contextual factors influence the use of ICT in the teaching and learning process?

4.1 Background of the Study

The current education program started in 2002, the grade one- to sixth (1-6th) lower primary school and then grade seven- to ninth (7-9th) upper primary school, and then grade ten-to-twelfth (10-12th) senior secondary school, open to students aged sixteen to eighteen (16-18) when students sit the exam for the West African Secondary School-Leaving Certificate Examinations (WASSCE).

The Gambia College, the school of education, has been training primary school teachers for two years and accredited with a primary school teacher certificate upon completing the course. Qualification of admission to the teachers' training is based on the senior secondary school leaving certificate. Secondary school teachers have also been training at Gambia College, the school of education for two years, and upon the completion of the course are awarded a higher teacher's certificate. The admission is based on the merit of the West African Examinations Council School Certificate (WAEC).

The draft ICT public education reform process started in 2002 and was scheduled to be completed in 2007. Thus, the main features of education policies include networks among all schools, computer literacy strategy formulation, and the ongoing training of all teachers

throughout the country. However, the question we still must ask is whether the plan has been implemented.

4.2 Research Design

The design is structured interview and open-ended wording of questions that were administered in the field at the School of Teacher Education, the Gambia College. It allows respondents to provide as much detailed information as they want and allows researchers to ask questions as a follow-up method (Turner III, 2010, p.756). The main objective of this design is to elicit the same sets of questions from each respondent, which may facilitate later comparisons of data between participants or groups (Gall, Gall & Borg, 2003).

Creswell (2014, p.32) describes qualitative research as a method of understanding a person or group, attributes to a social or human problem. Therefore, it involves the process of raising questions and procedures for collecting data in the context of the participation of the participants. Creswell (2014, p.48) suggest that the opinion of the participants is sought by the researcher to establish the phenomenon. Qualitative research is useful when the concept or phenomenon needs to be explored in cases where fewer studies have been conducted in the area. As a result, a qualitative approach is required in contemporary research and, as such, this study mainly focuses on the phenomenon of interest and is characterized by the following characteristics:

Qualitative research is conducted at the site where the participants experience the problem or issue under investigation. Data collection was achieved through conversation in the form of an interview, observation, and evaluation of participants ' attitudes within the phenomenon.

Since the outcomes of the research are fundamental to understanding the research questions by the participants. The researcher took the decision to use Google Drive application as the basses for ICT resources to recruitment participants. It offers a collaborative, authoring platform to

implement authentic learning tasks in the form of clinical cases (Rowe, Bozalek & Frantz, 2013).

It is an alternative to traditional client-server computing technology that allows users to access software applications, hardware, storage, and computing processes directly from the web, especially when the ICT resources are scarce, comes in handy in this case Murah, 2012, p. 162). The most common apparent reasons not to be online are expensive personal computer equipment and high data access costs, in developing countries where the Gambia is located. However, it appears that these countries are leap-frogging the PC and landline age and move directly to the mobile age (Sultana, Christ, Feisst & Curticapean, 2013, July).

The falling prices for smartphones, culminating in internet connectivity and PC-like operating systems, make joining the online community more affordable for the segments of the global population. Teachers can store learning content in a way that is accessible to everyone, including mobile and smartphones, which seems advantageous. Subsequently, learning content can be accessed by personal computers and mobile and smartphones and be accessible for a wide range of devices and users. The researcher capitalizes on the opportunity of using free resources and stores learning content in the cloud.

The researcher demonstrated with the participants the way to access tools to create and edit a series of files, including documents (Google Doc), spreadsheets (Google Sheets), and presentations (Google Slides), which allows them to reflect in responding to the research interview questions.

4.3 Research Instrument

In general, data for qualitative research are derived from four field-based instruments: interviewing, observing, collecting and examining, and feeling (Yin, 2012). Interviews can be open-ended, structured, or semi-structured. According to Yin (2012), structured interviews

involve strictly scripted interactions between researchers and participants, with formal, closed-ended questions. In contrast, open-ended interviews adopt a two-way conversational mode, in which researchers and participants interact freely, and each participant answers different sets of questions. Moreover, participants may have a chance to question researchers (Owens, 2014). Semi structured interviews are more flexible than structured interviews. In a semi structured interview, participants and researchers explore the issue within a framework of themes with a set of predetermined questions (Yin, 2012). For this study, I will collect data from semi structured, in-person interviews with the participants using open-ended questions. The semi structured interview format enables a researcher to collect accurate data with the same set of questions while gaining participants' experiences in depth.

This qualitative study will utilize interviews as the main tool in collecting the required information. In these interviews, the researcher will serve as the interviewer and the participants as the interviewee. The role, therefore, of the researcher is to elicit information from the participants during the interviews by asking the interview questions.

In a qualitative study, the researcher is the main tool in collecting data from the participants. As such, a qualitative researcher must be reflexive and must recognize his or her role in the data collection process by subjecting himself or herself to self-scrutiny (Moser & Korstjens, 2018). Critical self-scrutiny includes identification of the preconceived opinions or beliefs that the qualitative researcher may have either on the very phenomenon being studied or on the participants under investigation (Moser & Korstjens, 2018). The qualitative researcher must then attempt to determine the effects of these preconceived beliefs or opinions on what is heard, seen, and reported during the data collection process (Moser & Korstjens, 2018). It is suggested that the qualitative researcher must be reflexive in order to minimize the said effects, if there is any, and to enhance the credibility of the findings (Moser & Korstjens, 2018).

Interviews, being a type of guided conversation, require communication and social interaction skills (Nilson, 2017). As such, a qualitative researcher must have the ability to remain interested and engaged while listening, suspend preconceived judgments, and probe the persons being interviewed to give more in-depth information without making them think that they are being subjected to an interrogation (Nilson, 2017). Conducting interviews also requires that the interviewer is good in nonverbal skills like gestures, phatic communication cues, and body language (Nilson, 2017). And when the interview involves more than one participant, the interviewer is particularly challenged in managing the participants who would dominate the discussion, who are shy, and who have conflicting opinions (Nilson, 2017).

4.4 Sampling Size and Procedures

The research participation was facilitated following a written request from the researcher to the Principal of the Gambia College, and, in exchange, the request was accepted and confirmed. The sample is the purposeful sampling technique in this research includes five (5) teachers' instructors and fifteen (15) teachers' students for the study. Yin (2002) posits that purposive sampling requires a gathering of participants being carefully selected to understand the research questions better. This study was carried out at the school of teacher education, Gambia College, as the leading supplier of primary school teacher certificate (PTC) and secondary school teacher certificate (HTC) in The Gambia.

In the first stage of the data collection, the researcher explored cloud computing applications (Google drive) with participants. During the session, the researcher presents and explores Google Drive applications such as Google Doc, Google Slides, and Google Sheets. The discussion was prompted with participants on the implications supporting in teaching and learning support synchronous, asynchronous, and collaboration regarding the research questions.

Purposeful sampling is a common and popular sampling methods. Here, the sample elements are selected based on some predetermined criteria. These criteria usually include knowledge of the population, its elements, and research objectives (Babbie, 1986). In this scenario, the researcher can directly perform the study of the identified population, the teachers at the school of education, Gambia College. While it is recommended for qualitative research by the versatility of purposeful sampling, it has some limitations. In the beginning, distortions can be caused by the inadequate sample size, to only concentrate on the most appropriate respondents, especially in situations where the population is small, the scope or distribution of the sample may be severely restricted. Second, there may be distortions due to inadequate data collection depth (Babbie, 1986).

Besides careful sampling, many researchers believe that optimal variance sampling is a very useful sampling tool. Here is the ability to identify and explain key concepts or main findings for different participants, programs, or events. The goal is to set up trends in the mass of different and seemingly unrelated phenomena. And to reach the last point, sampling tends to continue. It must be determined whether the appropriate sample element is selected. This decision has a lot to do mainly depends on (a) resource restriction, (b) regularity emergence, or (c) cover-extension or excessively beyond the limits of research.

Table 1: First Phase of Research Instrument and Participants

Research Questions	Data Collection Instrument	Participants
1) How do teachers in the Gambia College integrate ICT into the teaching and learning process?	Exploring Cloud computing Application (Google Drive) Google Doc, Google Sheets and Google Slides	Teacher Instructors (5) Teacher students (15)

2) How do personal and contextual factors influence the use of ICT in the teaching and learning process?	Exploring Cloud computing Application (Google Drive) Google Doc, Google Sheets and Google Slides	Teachers Instructors 5 Students Teachers 15

4.5 Data collection

Interviews and observation are the dominant forms of data collection in qualitative research. Other sources of data collection for qualitative research include analysis of documents: official records, letters, newspaper accounts, diaries, and reports.

A set of twenty (20) questions and followed-up questions were developed, which were open-ended in nature, wherein the respondents could answer subjective questions comprehensively. The questions primarily explore cloud computing applications (Google drive) as a mean of basic ICT resources such as Google Doc, Google Slides, and Google Sheets (see appendix D). Gall, Gall, and Borg (2003) postulate that in structured interviews, all questions be written in advance, in detail format so that questions can be used verbatim during the interview. Furthermore, as well as the order of questions to maintain and consistent throughout the interviews. The verbal exchange where a person (interviewer) obtains information through a series of questions from a different individual (interviewee). The interviews permitted a face-to-face discussion on the subject, that gave the researcher details about the study directly as well as the researcher could further probe matters that required more clarity.

Lund (2012) states that this form of the interview is one of the most suitable methods of data collection of the research on the basis that the theoretical framework and research questions are represented through the description of specific inferences and positions.

The purpose of the interview was to allow the researcher to collect descriptive data from the participant's perspective and gain insight into how the participant understands and interprets the phenomenon under study. For the sake of reliability, participant observation study was carried out.

Progressively educational systems around the world are predominantly more focused on presenting ideas in the form of political and pedagogical dogma, rather than presentation and understanding of practice in schools (Haugland, 2005). As a result, our knowledge about the situation in schools becomes inadequate. Therefore, interviewing the teachers involved is a preferred strategy for obtaining information about their thinking and for understanding their school environment. These interviews allowed the researcher to capture the perspectives of pedagogic use of ICT in the teaching and learning process, its pedagogic impact, and the role played by the teachers in enhancing the use of ICT in the school of teacher education, the Gambia College. Field observation is one of the relevant information for qualitative analysis (Creswell, 2008). The purpose of the notes in this field is to explain the researcher's experience of the phenomenon. The first predetermined stage of data collection was the recruitment of participants preparing to understand the research issues to be reflected in the interview questions. The researcher discussed the session with the individual participants in the framework of cloud computing (Google Drive). The researcher has been able to observe not only verbal but also non-verbal data. Physical expressions have been collected and interpreted as an additional source of data.

Table 2: First Phase Observation of Participants using Google Drive

Application exploration	**Participants**
Exploring Cloud computing Application (Google Drive) Google Doc, Google Sheets	Teacher Instructors (5) Teacher students (15)

and Google Slides	
Observation of Participants using Google Drive	Observing signs of interest (e.g. raising hands, listening carefully, respectively) Observing signs of boredom (e.g. distraction, talking to classmates, respectively)

In a direct observation observer do not directly try to become contextual participants. Since, the primary observer's goal is to be as unobtrusive as possible to prevent deviations in the observations. The researchers observed signs that participants were interested in raising their hands and listening carefully, as well as signs of boredom, which distracted them from talking with their classmates. Furthermore, a direct observation often does not require participants to be observed for a long time, but instead focuses on the individual rather than trying to understand the overall situation in depth.

Observation may be said to be a systematic approach to data collection, according to Crabtree (2006). Researchers participate in gathering knowledge about people in their natural world. During the study, the researcher observed teachers' instructors and teacher trainees using Google Drive as ICT resources during the first phase of data collection with participants. It gave the researcher direct information on the real situation on the ground about the teachers' use of ICT in teaching at the school of teacher education, Gambia College.

A brief discussion was held with the participants while exploring Google Drive application to support teaching in synchronous, asynchronous, and collaboratively regarding research questions. However, the researcher intends analyze the observation data by describing according to the overall impression from the data.

4.6 Ethical Consideration

The research ethic explains the different actions carried out by the researcher in the current study. According to Creswell (2014), the code of ethics includes two key areas, such as research standards and personal protection standards. Since this study will involve humans as its participants, the following ethical considerations shall be observed:

1. The participants will be asked to sign a consent form before participating in this study. In the consent form, the participants' willingness and voluntariness in taking part to this study shall be stipulated;
2. In the consent form, it shall likewise be stipulated that the participants may withdraw at any time that they want;
3. Aside from the possible contribution that the participants might provide in improving employee retention of other hotels, no other incentives will be used to compensate their participation;
4. There will be an agreement to be signed by the participants and the researcher stipulating that the data that the former will provide shall be stored in a secure, safe place for a period of five years after which said data will be destroyed; and
5. The names and personal information of the participants shall remain confidential.

(See the consent form as a reference in the appendix A).

4.7 Instrument Reliability

The degree to which the instrument delivers consistent results or data following repeats, according to Mugenda (2006, November), reliability is a measure. Besides, the reliability of research results often depends on the accuracy of the analysis method used in data collection.

Cross-sectional questions can lead participants to different interpretations of the same question; therefore, errors would have occurred due to a lack of consistency of responses.

4.8 Instrument Validity

Qualitative research requires a certain degree of trust between researchers and participants. This trust is of considerable significance to researchers so that it can be accepted or entered the research field by respondents. For this reason, it is necessary to clarify how to build credibility in order to enter the research environment.

4.9 Data analysis Technique

The study used thematic analysis methods to analyze the data. The responses to each question were coded for each component. The answers were categorized according to research questions and objectives.

Xu and Zammit (2020) believe that thematic analysis (TA) is a form of qualitative analysis and is common in healthcare, psychology, and other fields. Even so, details are rarely used to convey the data analysis process, especially in education. Braun and Clarke (2006) claim that thematic analysis provides a theoretically flexible and open approach to qualitative data analysis. It also identifies other qualitative methods for analyzing subjects or patterns on various epistemological and ontological positions.

The responses received during the interview are analysed in this chapter using the thematic analysis method. Thematic analysis is considered as a textual analysis method in which the data is rigorously reviewed and analysed to identify identical patterns or themes (Braun & Clarke, 2006, p. 2). This method of analysis is flexible, allowing the researcher to undertake any means of presenting the analyzed data, and thus, thematic analysis is not tied to any theoretical perspective. When looking into the disadvantages of thematic analysis, this method is less explored than other qualitative methods like grounded theory, ethnography, and

phenomenology, thus making it less attractive to adopt by novice researchers (Nowell, Norris, White, and Moules, 2017, p. 2). Also, this approach disallows the researcher to make claims about language use, thus questioning the aspect of ethics. However, as per Attride-Stirling (2001, p. 387), this offers an advantage to the researcher in terms of learning different ways of analyzing the data and further ensuring that the analysis is well interpreted by carefully evaluating the responses. Hence, this research selects the thematic analysis approach as it offers a flexible means to evaluate data and provide a rich and detailed analysis of data.

5 Thematic Analysis

To answer the research questions, qualitative analysis requires a high degree of ingenuity from abundant data sources to categories of relevant data (Creswell 2014). All interviews and field note as a direct observation were collected and transcribed for this analysis. The transcripts have been reviewed and reviewed in order to be familiar and consistent with the data. Since interviews were the fundamental basis for this data collection, data from teacher respondents were analyzed for trends and patterns, differences, and similarities in perspective.

Alhojailan (2012, p.40-41) argues that appropriate qualitative research should be capable of interpreting and in line with the data obtained. In order to detect and identify, for example, factors or variables which influence any issue that is caused by the participants. Therefore, the perception of the participants is critical in understanding their attitudes, behaviors, and thoughts. Thus, is in line with the features involved in the thematic analysis process.

5.1 Familiarizing with the Data

The below table 3 corresponds to the step where the data is understood, and major derivations are drawn. This is familiarizing with the data is to better interpret the opinions of the respondents. It assists the researcher in getting familiar with the data and understanding the participants' responses more effectively.

Table 3: Familiarized with the data mapped out

Microsoft Word for document creation, PowerPoint for presentation and the Excel spreadsheet for calculations, are most commonly used method and software for teaching and learning through ICT.
Google Drive is the most preferred option for sharing data, documentation, and storing data securely.
Most respondents demonstrate enough knowledge and skills related to the operation of Google Drive, Gmail and Microsoft Office.
Most respondents lack proper resources at home, such as laptops and working internet connection.

5.2 Generating Initial Codes

After familiarizing with the data, the next step is to organize the transcripts or data in a more meaningful and systematic form. This allows the researcher to identify the initial codes from the transcripts that may be latter use for the research themes. Coding reduces the large data into smaller and relevant text, and here, open color-coding is done to bring clarity to the complete coding process and ensure that the codes are related to the study's research questions. By color-coding, the responses, the researcher attempts to concise the information into only the relevant ones. This is done by reading the transcripts and highlighting the relevant text corresponding to the codes. The various segments of the transcripts that were only relevant to this research's research objective were coded. There were no pre-set codes, and every code was developed and modified when analyzing the data. The relevant themes identified through the coding process are presented in the following table. It is worth mentioning that not every data was taken into the transcript to begin generating the initial codes.

Table 4: Initial Coding Interview Questions

Questions	Responses	Initial Codes
Could you describe which software you are likely to use in your teaching?	**Microsoft Word** for document creation and **PowerPoint** for presentation and **excel spreadsheet** is commonly used in teaching and learning.	**Microsoft Word** **Microsoft PowerPoint** **Microsoft Excel** **Google Drive**
	Microsoft Word software is commonly used in teaching and learning to create a document…	
	PowerPoint for presentation is widespread use in teaching and learning.	

	With **Google Drive** I can use Google Doc, Google slides and Google Sheets with the storage just like Micro office for creating word document, excel spreadsheet…	
Could you describe your feelings and reflections about the use of Google drive resources to support – a) Your engagement in teaching practice in the class? b) When preparing the teaching material? c) When doing student assessment after lessons? d) When doing student assessment after lessons?	This **offers the ability to exchange documents and information, individually and collaboratively, through the learner-center approach**.	**Share Information** **Ability for Independent Research** **Free Storage and Security** **Used for Security Assessment** **Prepare Teaching Material**
	It gives us the **ability for independent research** and **sharing of documents** and files in a learner centered approach.	
	I'm going to use the resources. It provides **free storage and security for my work**.	
	If my **students can access the Internet** by using their laptops, I will **prepare teaching material** on the Google Drive.	
	I will most definitely **use it for student assessment**.	
Can you explain how do you use Google docs in planning and teaching your lesson?	To use Google Doc, you login to the Google Account. It is the same username/password for Gmail that you are using. I'll **draw up a lesson plan** on a specific topic I want to teach.	**Preparing Lessons**
Can you explain how you use Google slides in planning and teaching your lesson?	You sign up in Google Account to access Google Slides. It is the same username/password you use for Gmail. In Google Drive, I can **create Google Slides for presentations** like PowerPoint.	**Prepare Presentations**
Can you describe how you select the learning materials, when to use Google Drive?	I need to know if **students can access the internet** and **the subject I am teaching**.	**Internet Accessibility** **Subject being Taught**

As a teacher, do you work at home?	No, because I don't have my **own computer** and usually the **electric supply** is not stable.	**Personal Device** **Electricity Supply**
Can you explain how you obtain information and resources from the internet?	**Google** and **YouTube search** gives me knowledge and web resources.	**Search Engines** **Video-Sharing Platform**
Can you explain how you use email as a means of communication?	I used e-mail primarily for **external correspondence**. Maybe private persons, organisations and the public.	**Outside Correspondence in Various Sectors**
Can you explain how you use Word processor with students in the class?	I use word processor with students, mainly writing **essays** and **multiple-choice problems**.	**Writing Projects** **Preparing Questionnaires**
Can you explain how you use spreadsheets with students in the class?	I use spreadsheets document which can be manipulated in **calculations** using data arranged in grid rows and columns.	**Mathematical Calculations**
Can you explain how you use multimedia presentations, such as PowerPoint?	I use PowerPoint to **convey ideas/massages** in the presentation the same time for whole class.	**Present Ideas**
Can you explain how you plan your lessons?	I try to **topics that may excite students** considering their outcomes.	**Exciting Topics for Better Learning**
Can you describe how you use ICT as a means of students' evaluation instrument?	It usually a difficult problem we encountered. It is **not systematic due to the lack of ICT resources**.	**Lack of ICT Resources**
Can you describe your participation in using ICT as a means for training in collaboration?	I **did not experience participation** in using ICT as a means of collaboration.	**Lack of ICT a Means of Collaboration**
Can you describe your participation in using ICT as a means of communication?	I use **ICT as a means of communication** through **email, documentation, and presentations**.	**ICT used for Email and Documentation** **Prepare Presentations**
Can you describe your participation in using ICT in the research?	**I did not participate in using ICT in the research.**	**Lack of ICT Usage for Research**
Can you describe your participation in using ICT with the educational community?	I participated in an **online educational literacy group**.	**ICT for Literacy Group**

Can you describe your participation in using ICT in the innovation projects?	I **did not participate in the innovation project** using ICT.	**Lack of ICT Usage for Innovation**
Can you describe your account of using ICT in the classroom?	If I use ICT in the classroom, **my students get greater encouragement and participation** in the classroom.	**ICT Leads to Greater Encouragement and Participation**
Can you describe your participation in using ICT in your private capacity?	In particular, **I use the internet to check for information and e-mail** for correspondence.	**ICT used for Email and Documentation**
Can you describe how you use the internet for information and communication in the discussion forums?	It's an **instant message forum** where people can have conversations in the form of posted messages. These vary from **chat rooms** in that messages are often longer than one line of text and are stored at least temporarily.	**ICT used for Instant Messaging and Chatting**
Can you describe how you use the internet for information and communication in the blogs?	I'm not using the Internet for blog information and correspondence. It is a **forum for a writer or even a group of writers to express their views on a particular subject.**	**Writing Projects**
Can you describe your perceptions of the impact of ICT use in the classroom?	The use of ICT in the classroom is the best way out. However, the key issues are that we **do not have the tools in the classroom to use**. As a consequence, **attitude, actions and self-confidence in classroom ICT are poor**.	**Lack of ICT Resources** **Lack of Resources Affects Classroom Behaviour**
Can you describe the conditions of having access to ICT resources for utilising in your teaching?	**Computer access is difficult, usually without internet connectivity**. **Computers are obsolete and outdated**.	**Lack of Internet Connection** **Lack of ICT Resources**
Can you describe if there is anything that prevents you from utilising ICT in your teaching?	The main problems are electricity supply, **lack of ICT resources** and **skills** to use these resources.	**Lack of ICT Resources** **Lack of Skills to use ICT Resources** **Unfavourable Conditions**

	The lack of knowledge in ICT is caused by **unfavorable conditions**, **inadequate resources** and **low levels of education**.	
	ICT resources must be available for teaching and learning purposes, and there must be the availability of **skill training to attain integration**.	
	Unfavorable climate, inadequate resources, and low education levels are responsible for the lack of interest in ICT.	
	One obstacle is the **tools that are not available for ICT** use, and the **lack of awareness to use such tools is another obstacle**.	

Table 4 represents the reduction of large data into smaller and relevant text, and here, open color-coding is done to bring clarity to the complete coding process and ensure that the codes are related to the study's research questions.

5.3 Identified Major Themes and Sub-Themes

In the previous step, all the codes were segregated into preliminary themes. Now, it is essential to review, modify, and confirm whether all the developed themes are relevant or not. Any repetition, either in the themes or codes, must be identified here to ensure the most efficient analysis and interpretation of the responses. In this stage, the data associated with each theme and codes are read again and confirmed whether the data is supporting the developed themes. Further, it is ensured here if all the themes are aligned with the present research context. The researcher ensures here that all the themes are distinct from each other, none of them overlap, and if the themes have any relevant sub-themes or not. It is essential to note that while some of the codes that were repetitive are removed, not all the repetition can be avoided as the study

interviewed twelve (12) respondents, and so the data is limited. The below table corresponds to the finalized themes, where the codes are not colored.

Table 5: Identified major themes and sub-themes

Themes	Sub themes
Pedagogical competences (ICT Software Used in Teaching)	Microsoft Word
	Microsoft PowerPoint
	Microsoft Excel
	Video-Sharing Platform
	Search Engines
	Google Drive
Personal and contextual factors (Factors Affecting Use of ICT in Teaching)	Lack of ICT Resources
	Lack of Resources Affects Classroom Behaviour
	Lack of Internet Connection
	Lack of Skills to use ICT Resources
	Unfavourable Conditions
	Internet Accessibility
	Subject being Taught
	Personal Device
	Electricity Supply
	Exciting Topics for Better Learning
	Lack of ICT Usage for Innovation
	Lack of ICT a Means of Collaboration
	ICT used for Email and Documentation
	Lack of ICT Usage for Research
Technological competences (Benefits of Using ICT in Teaching)	Writing Projects
	Share Information
	Ability for Independent Research
	Free Storage and Security
	Used for Security Assessment
	Prepare Teaching Material
	Preparing Lessons
	Prepare Presentation
	Outside Correspondence in Various Sectors
	Preparing Questionnaires
	Mathematical Calculations
	Present Ideas
	ICT for Literacy Group
	ICT Leads to Greater Encouragement and Participation
	ICT used for Email and Documentation
	ICT used for Instant Messaging and Chatting

Table 5 represents codes that were identified into preliminary themes. In this stage, the data associated with each theme and code is reread and confirmed whether it supports the developed themes.

5.4 Results

The focus of the current study was the preparedness of teachers to integrate ICT into teaching. This provides insight into teachers' competences and uses in integrating ICTs. The results captured in the themes will be described in more detail in the following topics: Pedagogical competences, Personal and contextual factors and, Technological competences.

5.5 Pedagogical Competencies

Microsoft Office is the most common ICT tool being used in classroom teaching and online teaching. Such software has acknowledged the effectiveness of it in teaching and learning. MS Word is primarily used to format and create documents. Microsoft Word allows teachers to use preparation time more competently by allowing them to modify materials instead of making new ones. Microsoft Word allows resources to be shared effortlessly among writers. Teachers can discuss and share lesson plans, worksheets, or other materials on disk and modify them based on their requirements. The document created with Microsoft Word looks more refined and proficient, generating the interest of the students. Microsoft PowerPoint has become an ingrained part of teaching settings, particularly in large classes. PowerPoint can be a highly useful tool to aid learning through visual impact, improving audience focus, and increasing spontaneity and interactivity. Microsoft Spreadsheets offer concrete ways to explore abstract concepts in mathematics and other subjects. Spreadsheets contain a variety of formulae, which can be used in teaching mathematics. Further, Google Drive features such as Google Doc, Google Slides, and Google Sheets with the storage, just like the Micro office for creating a word document, an excel spreadsheet is also used for similar purposes.

5.6 Personal and Contextual Factors

The respondents reveal that teachers had a strong desire to integrate ICT into the teaching-learning process, even though with difficulties. Major barriers were lack of genuine software, inadequate ICT tools in the classroom, low-speed internet, lack of proper resources, lack of proper training skills, unavailability of latest ICT equipment, lack of expert technical staff, electricity supply, unfavorable conditions, respectively. Suggestions have been made for teachers' ongoing professional development to model new pedagogies and tools for learning to enhance the teaching-learning process. Teacher trainers and policymakers need to understand the barriers as their absence in the classroom affect the teacher's attitude, actions, and self-confidence, making ICT use in learning poor. Moreover, it was evident in the respondents' answers that the adoption of ICT is still at initial levels, as a lack of ICT usage was found in innovation, collaboration, and research.

5.7 Technological Competencies

As technology is introduced into the lessons, it is predicted that students will be more involved in the subjects they are learning. ICT offers different prospects to make learning more entertaining and amusing in terms of instructing similar things through new methods. With many online means, technology can help advance teaching. Teachers can use various apps or trusted online resources to develop conventional teaching methods and keep students more involved. Virtual lesson strategies, scoring software, and online evaluations can aid teachers to save time.

Furthermore, virtual learning environments in schools improves teamwork and knowledge sharing between teachers. ICT offers authors or even a community of authors a forum for sharing their views about topics for education, thus enhancing their readers' efforts. It is also an instant message forum where people can have conversations in the form of posted messages,

including different types of chat rooms. ICT enables various forms of formal communication. An email has become a standard form of communication, both inside an institution and with outside contacts. You may send emails to individuals or groups of people. This kind of technology-based communication allows easy external correspondence with private persons, organizations, and the public.

6 Summary

It was evident from the analysis that some resource-related issues have constrained teachers' use of ICT in their lessons. The most widespread resource-related issue was the lack of infrastructure. A significant number of respondents indicated that there were not enough resources needed to use technology where they taught and learned. Access is generally not very good. There are outdated computers, few software applications, and power supply not frequently in the classroom.

Teachers do not have adequate resources to encourage the ICT use. Physical infrastructure is a necessary condition for the successful use of digital technology (Searson, Laferriere & Nikolow, 2011, p. 1-5). Without physical resources, the cohesive integration of technologies into educational practices is unthinkable (Hew & Brush, 2007, p. 4-6). So, teachers are forced to give lectures in the traditional method with little use of digital technology.

The other issue affecting teaching practice is training related to the use of technology in educational practice. That gave rise to secondary contradictions in the activity system and influenced the technology used by the teachers. Because Teachers' technology skills were self-taught, they had limitations in what they could do. Therefore, they avoid using technology when they are not confident.

The provision of adequate ICT resources will ensure training personnel on how to use ICT can address technophobia, which may cause tutors and student-teacher trainees to fail to take up tasks that require integration of ICT. Given that the curriculum delivery was done in classrooms that were not ICT friendly, the study views that ICTs were mostly not aiding curriculum delivery in teacher training, and as a result, the student-teacher trainees lacked exposure on its integration.

6.1 Discussion

This study has investigated the integration of ICT teachers' competences and use at the school of education, Gambia College. This study has revealed the teachers' inadequate use of ICT platforms for teaching, among which the ICT infrastructure and access to resources and inadequate supply of power are significant impediments perceived by most teachers. Furthermore, the opinion of teachers signifies that fluctuation in the College's internet connection jeopardizes the integration and interest in using ICT platforms for teaching, and those incompatible classroom environments make it difficult to use ICT in some situations by lecturers. These results appear to be consistent with Lewis & Baker (2007) describing barriers to ICT integration as poor equipment, lack of skills, inadequate support, time constraints, lack of interest, or teachers' computer knowledge.

Lack of appropriate skills and knowledge in using computers is another factor that hinders the integration of ICT platforms for teachings and learning. Literature shows that teaching and learning is a complex process, including information, knowledge, representations, and beliefs from various sources and experiences. Moreno (2005) suggests that the research literature is the manifest in affirming that teacher education has many difficulties in overcoming the preconceived notions and attitudes that students carry when they begin their studies to become teachers. The efficiency and ethical management of information, skills, and attitudes will eventually be affected by technology. Subsequently, teaching and learning key skills, including digital skills, must be developed in this context (Plaza-de-la-Hoz, García-Gutiérrez & Moreno-Mediavilla, 2015).

6.2 Conclusion

The primary question this study attempted to find is the teachers' competences and use in integrating ICT into teaching. Based on the study results, the following conclusions have been drawn. The study shows that teachers at the school of education, Gambia College are not skilled enough in the integration of ICT and use in teaching due to inadequate training in technological use and pedagogical use.

The basic model of integration of ICT by the teacher, competence, and use, the theoretical framework laid in this study, recommends that teachers have absolute confidence in the use of ICT. Since both areas are essential for the use of ICT in classrooms, it is essential that teachers develop technological use and teaching ICT skills so that teachers can incorporate these technical tools into their teaching.

Integrating ICT into the teaching process is vital to focusing on pedagogical needs rather than technological skills. Suárez-Rodríguez et al., (2018) have pointed out the danger associated with it. When teachers have an interest in their training or continuous professional development, they are likely to start seeing ICT as a better tool to enhance their pedagogic practices. Secondly, after seeing the importance of changing their pedagogical practices, it is evident that they will start learning how to use ICT tools. In the course of learning, I suggest that this is one of the most crucial stages of teacher development because if they are not guided, they might focus more on the technological skills than pedagogical skills, resulting in limited influence in their classroom practices.

As a result, one may argue that when the right framework is put in place to focus on ICT integration in the curriculum, there will be a significant improvement in the teaching and learning process. However, clearly from this study that ICT itself cannot be performed as an added value, but resources strongly link technology and pedagogy, thus demands appropriate

skills. In order to support the teaching process, ICT is required to accommodate the curriculum subjects that are flexible to pedagogy.

The findings of this study suggest that ICT integration has been impeded by the lack of ICT resources, the ICT infrastructure and the classroom structure, teacher's attitudes, and students, teachers' skills, and the socio-economic conditions of teachers and students. If these programs are transformed so that training and professional development, teachers could be taught through ICT, it will eventually change their pedagogical practices, attitudes, and beliefs. When these trainings are appropriately organized with a sole focus on exposing teachers to ICT in relevant domains of pedagogy, it will be easier for them to use the tools in their classrooms effectively. Successful integration of ICT in teaching will demand some changes in the national curriculum. Also, teachers' individual efforts to integrate ICT are laudable efforts to influence the teaching and learning process. However, this individual initiative may not be enough in teaching and learning domains. Instead, I believe that the integration of ICT will be more successful in school. When the ministry of education, the school administration, the teachers, the students, and the community joint efforts and interest together and creates a professional learning environment.

In addition to ICT training for teachers, educators, and other stakeholders must start thinking of transforming their national curriculum framework entirely to integrate the use of ICT in the entire domain. After carrying out this study in the Gambia, it is indisputable that the national curriculum promotes the pedagogic use of ICT by the possible least means. A point made widely in the literature, analysis, and discussion part in this research is that developing countries such as the Gambia need to move from traditional teacher-centred and use ICT in the preparation of lessons plan, organizing students' assessment and report creating and managing ICT in pedagogic tasks.

Classroom structures should be created to promote collaborative practices. More investment should be directed to moving ICT tools to classrooms, allocating teachers' professional development to take effect. Despite their subject area and establishing a broadband network in the schools with a fast internet connection for easy access to the internet, teachers can access ICT for all teachers despite their subject area and establishing a broadband network in the schools. Furthermore, I will recommend more intervention studies to be carried to gather knowledge on the ICT situation, and the various means teachers can be helped to integrate ICT into their classrooms without any problems.

ICT has been a vital educational tool under proper conditions-where teachers are confident and reasonably skilled and competent in using ICT themselves. The teacher's philosophy must be to support a student-centred and constructivist pedagogy that could further integrate collaborative learning activities and aims at transforming the schools and prepare students to face the 21st-century knowledge economy.

To conclude, the first stage of implementing ICT should be useful in ensuring that teachers and students can make the most of it. In the teaching process, the application of ICT is more about practicality than theory. That is why it needs to be given teachers time to learn and experiment, to face the 'trial and error' process of their implementation and usage for teaching and learning. The teachers' ideology drives them into their teaching practice to integrate ICT (Arnseth & Hatlevik, 2012, p. 10). As this study finds, teachers will be encouraged to integrate ICT into the teaching and learning process, which will improve student achievement (Malaysia Education Blueprint, 2013, p. 16).

6.3 Recommendations

This study is limited to the school of education, Gambia College. Therefore, I would suggest researchers interested in conducting a similar study to investigate ICT integration and use in teaching and learning in different public and private schools where teachers graduating from training College are distributed.

It will be necessary to explore the pedagogical use of ICT from the students' views and their effect on their learning outcome to enhance the understanding of ICT integration in the Gambia education system. Moreover, since ICT is still an evolving concept within the Gambia education system, a comparative study examining the use of ICT by teachers in urban and rural areas will be necessary. In this way, a more general image which is not given in this study because of its qualitative nature could be achieved.

Teachers should use the potential of ICT resources to develop a broader range of skills, such as higher-level problem-solving skills, synthesis, analysis, and evaluation. The Head of Schools should encourage and promote appropriate ICT training for teachers. Schools should link with the relevant support services and seek to set up a mechanism to facilitate the staff members' sharing of good practice among themselves. Supporting service personnel should aim proactively to provide examples of how ICT resources can be used to promote the teaching process for all teacher trainees. Subsequently, in order to achieve this goal, teachers should also reiterate the benefits of using ICTs in the curriculum and support teaching practices to provide a more learning-centric and knowledge-based learning environment.

Among other issues, I recommend the following actions to take effect in order to integrate ICT into teaching and learning:

- Formulate the educator's role in implementing national ICT policies and strategies and develop ICT infrastructure standards for the college training programs, to ensure that teacher training program has adequate infrastructure.

- Develop ICT pedagogical standards to integrate ICT for teacher instructors and teacher students. The Colleges should establish strategies to identify the strengths and weaknesses of various ICTs applications with a view of adapting and integrating them into the process of teaching and learning.
- Use an advisory and participatory method to develop and promote ICT Standards. It could increase awareness and opportunities for standards to be adopted.

7 References

Ajayi, L. (2008). Towards effective use of information and communication technology (ICT) for teaching in Nigerian colleges of education. Asian Journal of information Technology, 5(5), 210-214.

Alhojailan, M. I. (2012). Thematic analysis: A critical review of its process and evaluation. West East Journal of Social Sciences, 1(1), 39-47.

Allen, A., & Hancock, S. D. (2017). Mapping culturally relevant pedagogy into teacher education programs: A critical framework. Teachers College Record, 119(1), n1.

Almerich, G., Orellana, N., Suárez-Rodríguez, J., & Diaz-García, I. (2016). Teachers' information and communication technology competences: A structural approach. Computers Education, 100, 110–125.

Almerich, G., Orellana, N., Suárez-Rodríguez, J., & Díaz-García, I. (2016). Teachers' information and communication technology competences: A structural approach. Computers & Education, 100, 110-125.

Anderson, J. (2010). ICT transforming education: A regional guide. *Published by UNESCO Bangkok*, *120*.

Angeli, C., & Valanides, N. (2005). Pre-service teachers as ICT designers: An instructional design model based on an expanded view of pedagogical content knowledge. Journal of Computer-Assisted Learning, 21(4), 292–302. https://doi.org/10.1111/j.1365-2729.2005.00135.x.

Angeli, C., & Valanides, N. (2009). Epistemological and methodological issues for the conceptualization, development, and assessment of ICT-TPCK: Advances in techonological pedagogical content knowledge (TPCK). Computers & Education, 52, 154–168. https://doi.org/10.1016/j.compedu.2008. 07.006.

Apergi, A., Anagnostopoulou, A., & Athanasiou, A. (2015). E-Learning for Elementary Students: The Web 2.0 Tool Google Drive as Teaching and Learning Practice. WorldJournal of Education, 5(3), 1-7.

Arnseth, H. C., & Hatlevik, O. E. (2010). Challenges in aligning pedagogical practices and pupils' competencies with the Information Society's demands: The case of Norway. In S. Mukerji & P. Triphati (Eds.), Cases on technological adaptability and transnational learning: Issues and challenges. Hershey: IGI global.

Aslan, A., & Zhu, C. (2016). Influencing Factors and Integration of ICT into Teaching Practices of Pre-Serviceand Starting Teachers. International Journal of Research in Education and Science, 2(2), 359-370.

Attride-Stirling, J., 2001. Thematic networks: an analytic tool for qualitative research. Qualitative research, 1(3), pp.385-405.

Avidov-Ungar, O., & Forkosh-Baruch, A. (2018). Professional identity of teacher educators in the digital era in light of demands of pedagogical innovation. Teaching and Teacher Education, 73, 183-191.

Ayeni, A. J. (2017). Teachers' Classroom Management and Quality Assurance of Students' Learning Outcome in Secondary Schools in Ondo State, Nigeria. *Journal of Social and Administrative Sciences*, *4*(2), 166-180.

Babbie, Earl. 1986. The Practice of Social Research. Belmont, California: Wadsworth Publishing Co.

Bada, S. O., & Olusegun, S. (2015). Constructivism learning theory: A paradigm for teaching and learning. Journal of Research & Method in Education, 5(6), 66-70.

Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. Psychological Review, 84(2), 191–215.

Barak, M., & Levenberg, A. (2016). Flexible thinking in learning: An individual differences measure for learning in technology-enhanced environments. Computers & Education, 99, 39-52.

Baylor, A. L., & Ritchie, D. (2002). What factors facilitate teacher skill, teacher morale, and perceived student learning in technology-using classroom? Computers & Education, 39(4), 395–414. https://doi. org/10.1016/S0360-1315(02)00075-1.

Biddix, J. P., Chung, C. J., & Park, H. W. (2016). Faculty use and perception of mobile information and communication technology (m-ICT) for teaching practices. Innovations in Education and Teaching International, 53(4), 375-387.

Bindu, C. N. (2016). Impact of ICT on teaching and learning: A literature review. International Journal of Management and Commerce Innovations, 4(1), 24-31.

Binyamin, S., Rutter, M., & Smith, S. (2017). Factors Influencing the Students' Use of Learning Management Systems: A Case Study of King Abdulaziz University.International Conference onE-Learning, 289.

Canales, A., & Maldonado, L. (2018). Teacher quality and student achievement in Chile: Linking teachers' contribution and observable characteristics. International journal of educational development, 60, 33-50.

Chan, C., & Holosko, M. J. (2016). A review of information and communication technologyenhanced social work interventions. *Research on Social Work Practice*, *26*(1), 88-100.

Creswell John, W. (2012). Planning, Conducting, and Evaluating Quantitative and Qualitative Research. Lincoln: University of Nebraska Daulat Purnama.

Creswell, J. W. (2008). Educational research: Planning, conducting, and evaluating quantitative and qualitative research. Upper Saddle River, N.J: Pearson/Merrill Prentice Hall.

Creswell, J. W. (2014). Research Design Qualitative, Quantitative, and Mixed Methods Approaches. Thousand Oaks, CA: SAGE Publications.

Creswell, J. W., & Creswell, J. D. (2017). *Research design: Qualitative, quantitative, and mixed methods approach*. Sage publications.

Creswell, J. W., & Poth, C. N. (2016). Qualitative inquiry and research design: Choosing among five approaches. Sage publications.

Danner, R. B., & Pessu, C. O. (2013). A survey of ICT competencies among students in teacher preparation programmes at the University of Benin, Benin City, Nigeria. Journal of Information Technology Education: Research, 12(1), 33-49.

Das, K. (2019). The role and impact of ICT in improving the quality of education: An overview. International Journal of Innovative Studies in Sociology and Humanities, 4(6), 97-103.

Department of State for Education. The Revised Education Policy 1988–2003. Banjul.

Emaliana, I. (2017). Teacher-Cantered or Student-Cantered Learning Approach to Promote Learning? Journal Social Humaniora, 10(2), 59-70.

Ertmer, P. & Ottenbreif-Leftwich (2010). Teacher Technology change: how knowledge, confidence, beliefs, and culture intersect. ISTE (International Society for Technology in Education), 42 (3), 255-284.

Ertmer, P. A., & Ottenbreit-Leftwich, A. (2013). Removing obstacles to the pedagogical changes required by Jonassen's vision of authentic technology-enabled learning. Computers & Education, 64, 175-182. doi: 10.1016/j.compedu.2012.10.008

European Commission. (2013). Survey of schools: ICT in education. Brussels: European Commission and Directorate-General for Communications Networks, Content and Technology. Retrieved from https:// ec.europa.eu/digital-agenda/node/51275.

Evaluation and Accountability of Department of Education and Training of Western Australia (EADETWA). (2007). Evaluation of the Information and Communication Technology (ICT) Knowledge and Skills Levels of Western Australian Government School Teachers. Department of Education and Training of Western Australia. Retrieved from http://det.wa.edu.au/accountability/detcms/ education/evaluation-and-accountability/binary-files/evaluation-reports/teacher-ict-skills-2006.en?cat-id=13027342.

Fakeye, D. (2012) Teacher's qualifications and subject masterly as predictors of achievement in English Language in Ibara Papa Division of Oyo State. Global Journal of Human Social Science, 12(3).[https://globaljournals.org/GJHSS_volume12/1-Teacher-Qualification-and-subject-Mastery.pdf (Accessed on 16/12/2012)].

Fraillon, J., Ainley, J., Schulz, W., Friedman, T., & Duckworth, D. (2019).Preparing for life in a digital world: theIEA International Computer and Information Literacy Study 2018International Report.

Fraillon, J., Ainley, J., Schulz, W., Friedman, T., & Gebhardt, E (2014).Preparing for life in a digital age: The IEA International Computer and Information Literacy Study international report. pringer Open.

UNICEF. (2000). Dakar framework for action. Education for all: Meeting our collective commitments.

From, J. (2017). Pedagogical Digital Competence--Between Values, Knowledge and Skills. Higher Education Studies, 7(2), 43-50.

Fu, J. (2013). Complexity of ICT in education: A critical literature review and its implications. International Journal of education and Development using ICT, 9(1), 112-125.

Gardner, C. M. (2011). *Qualifying for Quality: Unqualified Teachers and Qualified Teacher Shortages in the Gambia*. VSO.

Gardner, C. M. (2011). Qualifying for Quality: Unqualified Teachers and Qualified Teacher Shortages in the Gambia. VSO.

Gil-Flores, J., Rodríguez-Santero, J., & Torres-Gordillo, J. J. (2017). Factors that explain the use of ICT in secondary-education classrooms: The role of teacher characteristics and school infrastructure. Computers in Human Behavior, 68, 441-449.

Gil-Flores, J., Rodríguez-Santero, J., & Torres-Gordillo, J. J. (2017). Factors that explain the use of ICT in secondary-education classrooms: The role of teacher characteristics and school infrastructure. Computers in Human Behavior, 68, 441–449. https://doi.org/10.1016/j.chb.2016.11.057.

Gray, L., Thomas, N., and Lewis, L. (2010).Teachers' Use of Educational Technology in U.S. Public Schools: 2009 (NCES 2010-040).National Center for Education Statistics, Institute of Education Sciences, U.S. Department of Education. Washington, DC. Retrieved from https://nces.ed.gov/ pubs2010/2010040.pdf.

Hargreaves, A. (2010). Change from Without: Lessons from Other Countries, Systems, and Sector. En A. Hargreaves; A. Liberman; M. Fullan y D. Hopkins (eds.)Second International Handbook of Educational Change, 105-117. New York: Springer.

Hermawan, H. D., Deswila, N., & Yunita, D. N. (2018, July). Implementation of ICT in Education inIndonesia during 2004-2017. In 2018 International Symposium on Educational Technology (ISET) (pp. 108-112). IEEE.

Hernandez, R. M. (2017). Impact of ICT on Education: Challenges and Perspectives. Journal of Educational Psychology-Propositos y Representaciones, 5(1), 337-347.

Hinostroza, J. E. (2018). New challenges for ICT in education policies in developing countries: Theneed to account for the widespread use of ICT for teaching and learning outside the school. In ICT-Supported innovations in small countries and developing regions (pp. 99-119). Springer, Cham.

Hoepfl, Marie C., 1997. Choosing Qualitative Research: A Primer for Technology Education Researchers. Journal of Technology Education 9, 1: 1-16.

Hsu, S. (2010). Developing a scale for teacher integration of information and communication technology in grades 1–9. Journal of Computer Assisted Learning, 26, 175–189. https://doi.org/10.1111/j.1365-2729. 2010.00348.x.

Hsu, S., & Kuan, P. Y. (2013). The impact of multilevel factors on technology integration: The case of Taiwanese grade 1–9 teachers and schools. Educational Technology Research and Development, 61(1), 25–50. https://doi.org/10.1007/s11423-012-9269-y.

Ibieta, A., Hinostroza, J. E., Labbe´, C., & Claro, M. (2017). The role of the Internet in teachers' professional practice: Activities and factors associated with teacher use of ICT inside and outside the classroom. Technology, Pedagogy and Education, 26(4), 425–438.

Inan, F. A., & Lowther, D. L. (2010). Factors affecting technology integration in K-12 classrooms: A path model. Educational Technology Research and Development, 58(2), 137–154. https://doi.org/10.1007/ s11423-009-9132-y.

Ivongbe, M., Ojeifo, S., Akhator, P., & Omorogbe, H. (2010). ICT AND EDUCATION IN AFRICA: A PARADIGM SHIFT IN TEACHER PROFESSIONAL

DEVELOPMENT IN THE GAMBIA. In *INTED2010 Proceedings* (pp. 4384-4392). IATED.

Jabaka, S., & Danbaba, N. (2014). Barriers to ICT utilization in basic education in Nigeria. In Proceedings of South Africa International Conference on Education (pp. 71-77).

Johnes, J., Portela, M., & Thanassoulis, E. (2017). Efficiency in education.

Kabakci Yurdakul, I., & Coklar, A. N. (2014). Modeling preservice teachers' TPACK competencies based on ICT usage. Journal of Computer Assisted Learning, 30(4), 363–376. https://doi.org/10.1111/jcal. 12049.

Koehler, M. J., & Mishra, P. (2005). What happens when teachers design educational technology? The development of technological pedagogical content knowledge. Journal of Educational Computing Research, 32(2), 131–152.

Kristiawan, M., & Muhaimin, M. (2019). Teachers' Obstacles In Utilizing Information and Communication Technology. International Journal of Educational Review, 1(2), 56-61.

Krumsvik, R. J. (2011). Digital competence in the Norwegian teacher education and schools. Hö-gre utbildning, 1(1), 39–51.

Lai, C. (2015). Modeling teachers' influence on learners' self-directed use of technology for language learning outside the classroom. Computers & Education, 82, 74-83.

Law, N. (2009). Mathematics and science teachers' pedagogical orientations and their use of ICT in teaching. Education and Information Technologies, 14(4), 309–323. https://doi.org/10.1007/s10639- 009-9094-z.

Lee, J.C.K. & Yin, H.B. (2011). Teacher's emotions and professional identity in curriculum reform: A Chinese perspective. Journal of Educational Change, 12, 25-46.

Leu, E., & Ginsburg, M. (2011). First principles compendium: Designing effective education programs for in-service teacher professional development. Washington, DC: EQUIP1 and American Institutes for Research. Retrieved May, 23, 2016.

Lindberg, J. O., Olofsson, A. D., & Fransson, G. (2016). Contrasting views: Student and teacher perceptions on ICT in education. In ICICTE 2016, International Conference on Information and Communication Technologies in Education, Rhodes, Greece, 7-9 July, 2016 (pp. 1-10).

Liu, F., Ritzhaupt, A. D., Dawson, K., & Barron, A. E. (2017). Explaining technology integration in K-12 classrooms: A multilevel path analysis model. Educational Technology Research and Development, 65(4), 795–813. https://doi.org/10.1007/s11423-016-9487-9.

Lund, T. (2012). Combining qualitative and quantitative approaches: Some arguments for mixed methods research. Scandinavian Journal of Educational Research, 56(2), 155-165.

Makori, A., & Onderi, H. (2013). Evaluation of secondary school principals' views on the Use of untrained teachers in lesson delivery in a free secondary education system era in Kenya.

Makori, A., & Onderi, H. (2014). Examining the teaching and learning resources related challenges facing small and medium-sized public secondary schools in Kenya: A comparative analysis.

Malaysia Education Blueprint 2013-2025. (2013). Preliminary Report. Preschool to Post-Secondary Education. Ministry of Education Malaysia.

Mir, S. A. (2019). ICT integrated higher education: Prospects and challenges. International Journal of Research in Economics and Social Sciences (IJRESS), 8(2), 1-4.

Mobegi, F. O., & Ondigi, B. A. (2011). Coping with quality assurance challenges faced by secondary schools headteachers in Gucha district, Kenya. Educational Research and Reviews, 6(12), 746-752.

Murah, M. Z. (2012). Teaching and learning cloud computing. Procedia-Social and Behavioral Sciences, 59, 157-163.

Murati, R., & Ceka, A. (2017). The use of technology in educational teaching. Journal of Education and Practice, 8(6), 197-199.

Nowell, L.S., Norris, J.M., White, D.E. and Moules, N.J., 2017. Thematic analysis: Striving to meet the trustworthiness criteria. International Journal of Qualitative Methods, 16(1), p.1609406917733847.

Özdemir, S. (2017). Teacher views on barriers to the integration of information and communication technologies(ict) in Turkish teaching.

Pacific Policy Research Center. 2010. 21st Century Skills for Students and Teachers. Honolulu: Kamehameha Schools, Research & Evaluation Division.

Pelgrum, W. J. (2009). Indicators on ICT in primary and secondary education. Brussels: Education, Audiovisual and Culture Executive Agency. Retrieved from http://eacea.ec.europa.eu/llp/studies/ documents/study_on_indicators_on_ict_education/final_report_eacea_2007_17.pdf.

Philip A., Oluwagbemi O., Oluwaranti A. (2010) An Evaluation of the Impact of Information and Communication Technologies Diffusion in Nigeria's Higher Educational Institutions, Journal of Information Technology Impact 10 (1) pp. 25-34.

Plaza-de-la-Hoz, J., García-Gutiérrez, J., & Moreno-Mediavilla, D. (2015, November). How do teachers develop Digital Competence in their students? Appropriations, problematics and perspectives. In *2015 International Symposium on Computers in Education (SIIE)* (pp. 38-43). IEEE.

Prasad, C. V., Lalitha, P., & Srikar, P. V. N. (2015). Barriersto the Use of Information and Communication Technology (ICT) in Secondary Schools: Teacher's Perspective. Journal of Management Research, 7(2), 190-208.

Ratheeswari, K. (2018). Information communication technology in education. Journal of Applied and Advanced Research, 3(1), S45-S47.

Rowe, M., Bozalek, V., & Frantz, J. (2013). Using Google Drive to facilitate a blended approach to authentic learning. *British Journal of Educational Technology*, *44*(4), 594-606.

Sang, G., Valcke, M., Van Braak, J., & Tondeur, J. (2010).Student teachers' thinking processes and ICT integration :Predictors of prospective teaching behaviors with educational technology. *Computers & Education*, *54*(1), 103-112.

Sang, G., Valcke, M., van Braak, J., Tondeur, J., & Zhu, C. (2011). Predicting ICT integration into classroom teaching in Chinese primary schools: Exploring the complex interplay of teacher-related variables. Journal of Computer Assisted Learning, 27(2), 160–172. https://doi.org/10.1111/j.1365- 2729.2010.00383.x.

Searson, M., Laferriere, T., & Nikolow, R. (2011). Barriersto successful implementation of technology integration in educational settings. In *Conference presentation at EduSummIT, Paris. Retrieved from http://edusummit. nl/res2011/calltoaction2011/briefpapers2011*.

Semerci, A., & Aydin, M. K. (2018). Examining High School Teachers' Attitudes towards ICT Use in Education. International Journal of Progressive Education, 14(2), 93-105.

Sidorkin, A. M., & Warford, M. K. (2017). Reforms and innovation in education. Springer.

Skinner B.F (1938). The Behavior of Organisms: An Experimental Analysis. Cambridge, Massachusetts: B.F. Skinner Foundation.

Skinner, B. F. (1958). Teaching machines. Science, 128(3330), 969-977.

Stratton, C., Bailey, D. E., & Leonardi, P. M. (2019). Translating national discourse into teaching and learning outcomes: Portability and connectivity in developing countries' ICT in education (ICT4E) initiatives. New Media & Society, 1461444819884373.

Suárez-Rodríguez, J. M., Almerich, G., Díaz-García, I., & Fernández-Piqueras, R. (2012). ICT Competences of teachers: Influence of personal and contextual factors. Universitas psychologica, 11(1), 293-309.

Suárez-Rodríguez, J., Almerich, G., Orellana, N., & Díaz-García, I. (2018). A basic model of integration of ICT by teachers: Competence and use. *Educational Technology Research and Development*, *66*(5), 1165-1187.

Sultana, R., Christ, A., Feisst, M., & Curticapean, D. (2013, July). Learning in the cloud: A new challenge for a global teaching system in optics and photonics. In *Education and Training in Optics and Photonics* (p. EThF1). Optical Society of America.

Tallvid, M. (2016). Understanding teachers' reluctance to the pedagogical use of ICT in the 1: 1 classroom. Education and Information Technologies, 21(3), 503-519.

Taneri, P. O. (2017). The Viewpoints of Instructors about the Effects of Teacher Education Programs on Prospective Teachers' Affective Characteristics. Eurasian Journal of Educational Research, 70, 105-120.

Turner III, D. W. (2010). Qualitative interview design: A practical guide for novice investigators. The qualitative report, 15(3), 754.

Uerz, D., Volman, M., & Kral, M. (2018). Teacher educators' competences in fostering student tteachers' proficiency in teaching and learning with technology: An overview of relevant research literature. Teaching and Teacher Education, 70, 12-23.

UNESCO, (2002). Information and Communication Technology in Education–A Curriculum for Schools and Programme for Teacher Development. Paris: UNESCO.

UNESCO. (2011). UNESCO ICT Competency Framework for Teachers. Paris: UNESCO. Retrieved from http://iite.unesco.org/pics/publications/en/files/3214694.pdf.

Vanderlinde, R., Aesaert, K., & Van Braak, J. (2014). Institutionalised ICT use in primary education: A multilevel analysis. Computers & Education, 72, 1–10. https://doi.org/10.1016/j.compedu.2013.10. 007.

Voogt J. (2010). Teacher factors associated with innovative curriculum goals and pedagogical practices: differences between extensive and non-extensive ICT-using science teachers. Journal of Computer Assisted Learning 26, 453–464.

Wyatt, M., & Ončevska Ager, E. (2017). Teachers' cognitions regarding continuing professional development. Elt Journal, 71(2), 171-185.

Xu, W., & Zammit, K. (2020). Applying Thematic Analysis to Education: A Hybrid Approach to Interpreting Data in Practitioner Research. International Journal of Qualitative Methods, 19, 1609406920918810.

Zhang, J., Yang, J., Chang, M., & Chang, T. (2016). ICT in education in global context. The Best Pracices in K-12 Schools.

Zhou, G., Zhang, Z., & Li, Y. (2011). Are secondary preservice teachers well prepared to teach with technology? A case study from China. Australasian Journal of Educational Technology, 27(6).

APPENDIX A

Request for Thesis Research

Principal Aboubacarr Jallow
The Gambia College
PMB 144
West Coast Region
Brikama
Tel. +220 4484812
Email: principal@gambiacollege.edu.gm

29th January 2020

Saikou Marong
Address Ylikorvantie 25 As 23
96300 Rovaniemi
Finland
Tel. +358505434288
Email: smarong@ulapland.fi

Dear Mr. Jallow,

I am a student in the Master's degree program in Media Education at the University of Lapland, Finland, where I am writing my master's thesis, and the topic is **Integrating ICT use into teaching and learning in the teacher training program in The Gambia.** The supervisor of my thesis is Dr. Mari Maasilta.

The purpose of the study is to investigate teachers' ICT competencies and use of ICT technologically and pedagogically, personal-professional use, and the use in the classroom.

I am requesting for your kind permission to collect the research data in your institution for two days sessions, the first day an introduction and tutorial to Google Drive use as basic ICT resource and the second-day research data collection through an interview question.

The data will be collected and use for research purposes only and will be dealt with anonymously. In addition, I give assurance to provide you a copy of the thesis upon its conclusion.

Yours Sincerely,

Saikou Marong
Student

Dr. Mari Maasilta
Docent, University Lecturer

APPENDIX B

Postal Address: PMB 144
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General Office 220-44-83-136
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THE GAMBIA COLLEGE

PRINCIPAL: Aboubacarr Jallow

Ref: CA/GC/Vol. 1(15) 2020

31st January, 2020

Saikou Marong
Address Ylikorvante 25 As 23
96300 Rovaniemi
Finland
Tel. +358505434288

Dear Marong,

Your missive dated 29th January, 2020 requesting to conduct research in college is acknowledged.
I wish to inform you that the Principal has given directives to grant you permission to conduct your data collection as requested.

On behalf of the Principal I wish you a very successful data collection in advance.

Thank you.

Yours sincerely,

.....

Demba SM Yabou
Registrar

Cc: Principal
File

APPENDIX C

Informed consent

Your participation in this research is voluntary without any pre-conditions. However, the researcher assures you that none of your personal or private information will be shared or disclosed in public in this research under any circumstances. The data will be solely for academic purposes. Thank you for your participation.

APPENDIX D

Interview questions

1. Could you describe which software you are likely to use in Google Drive to support your teaching?
2. Could you describe your feelings and reflections about the use of resources in Google drive to support your teaching?

A) Describe your engagement with the class?

B) When selecting the teaching material?

C) How do you assess students after lessons?

3. Can you describe the benefits of using Google docs in your lesson?
4. Can you explain how to use Google slides and Google sheets in your teaching lesson?
5. Can you explain when and where you use email as a means of communication?
6. Can you explain how you use Word processor and spreadsheets with students in the class?
7. Can you explain how you use multimedia presentations, such as PowerPoint, with students' clarification?
8. Can you explain how you plan your lessons in different situations?
9. Can you describe your motivation using ICT with students' in the class?
10. Can you describe your participation in using ICT in training collaboration?
11. Can you describe your participation in ICT communication training and research?
12. Can you describe your participation in using ICT with the educational community?
13. Can you describe your participation in using ICT in innovative projects?
14. Can you describe your account of using ICT in your lessons?
15. Can you describe participating in using ICT in your private capacity?
16. Can you describe how to search the Internet for information and resources for communication in the blog and discussion forums?
17. Can you describe your perceptions of the impact of ICT use in the classroom?
18. Can you describe the conditions of having access to ICT resources for use in your teaching?

19. Can you describe if there is anything that prevents you from using ICT in your teaching?

20. Can you describe in opinion what should be done to achieve ICT integration at the College?