UNIVERSITY OF EDUCATION, WINNEBA

THE RELATIONSHIP BETWEEN PRE-SERVICE TEACHERS' WASSCE RESULTS AND THEIR ACADEMIC PERFORMANCE AT THE PRESBYTERIAN COLLEGE OF EDUCATION

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DECLARATION

Student's Declaration

I, William Agyei Brantuo, declare that this thesis, with the exception of quotations and references contained in published works which have all been identified and duly acknowledged, is entirely my own original work, and it has not been submitted, either in part or whole, for another degree elsewhere.

Signature: …….

Date: ……..……

Supervisor's Declaration

I hereby declare that the preparation and presentation of this work was supervised in accordance with the guidelines for supervision of thesis as laid down by the University of Education, Winneba.

Mr. Michael Edmund Amppiah (Supervisor)

Signature: …….

Date: ……..……

DEDICATION

This work is dedicated to my family for their support and encouragement towards the completion of this thesis.

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ABBREVIATIONS

ACT	:	American College Testing
ATAR	:	Australian Tertiary Admission Rank
B.Ed.	:	Bachelor of Education
BECE	:	Basic Education Certificate Examination
CGPA	:	Cumulative Grade Point Average
CoE	:	Colleges of Education
CPD	:	Continuous Professional Development
CRDD	:	Curriculum Research Development Division
DBE	:	Diploma in Basic Education
GES	:	Ghana Education Service
GPA	:	Grade Point Average
ICT	:	Information and Communication Technologies
ICTD	:	Information and Communication Technology Division
ILE	:	Innovative Learning Environments
InTASC	:	Interstate New Teacher Assessment and Support Consortium
JHS	:	Junior High School
KG	:	Kindergarten
MoE	:	Ministry of Education
NAB	:	National Accreditation Board
NaCCA	:	National Council for Curriculum and Assessment
NaSIA	:	National School Inspectorate Authority
NCTE	:	National Council for Tertiary Education
NEA	:	National Education Assessment
NIB	:	National Inspectorate Board

NTC	:	National Teaching Council
NTCE	:	National Council for Teacher Education
NTS	:	National Teaching Standards
OECD	:	Organisation for Economic Co-operation and Development
PISA	:	Program for International Student Assessment
PRINCOF:		National Conference of Principals of Colleges of Education
PTA	:	Parent Teacher Association
PTPDM	:	Pre-tertiary Teacher Development and Management
SAT	:	Scholastic Assessment Test
SDGs	:	Sustainable Development Goals
SHS	:	Senior High School
SMC	:	School Management Committee
SSSCE	:	Senior Secondary School Certificate Examination
TAD	:	Test Administration Division
TAFE	:	Technical and Further Education
TDD	:	Test Development Division
TED	:	Teacher Education Division
TIMSS	:	Trends in International Mathematics and Science Study
T-TEL	:	Transforming Teacher Education and Learning
UCC	:	University of Cape Coast
UEW	:	University of Education, Winneba
UN	:	United Nations
WAEC	:	West African Examination Council
WASSCE:		West African Senior School Certificate Examination

ABSTRACT

In line with international best practices, countries across the globe are intensifying their teacher education institutions in order to train world class teachers to feed their schools. It is against this background that this research work tried to find out how robust the admission process at the Presbyterian College of Education, Akropong is. This is because admitting students into the College of Education is the first step in ensuring a sound teacher training program. The correlational design was used for the study and the purposive sampling technique was employed to select the standardized tests scores of 2,097 students' WASSCE entry results against their Final GPA at the College of Education for the data analysis using SPSS 22.0 version. The results of the analysis proved that those who entered into the College of Education with good grades from the Senior High School exited with good GPAs and the inverse was true. Also on the issue of gender difference in terms of performance, it was revealed that males entered with slightly better results than their female counterparts and the final GPA were in the same manner. Again the average entry grades and the graduating CGPA for the four years were significantly different. However where the gender parity ratio was low, the differences in the male and female CGPA was minimal The researcher therefore recommends that the college must move beyond the normal training and put in measures to ensure that most of the students are able to improve on their performance to be at par with the current demands of a world class teacher. More importantly there should be enough gender sensitive and female- friendly measures to ensure that the gender parity ratio is reduced further so that the females can catch up with the males in terms of academic achievement.

CHAPTER 1

INTRODUCTION

1.0 Overview

This chapter gives an account of the research work, taking into consideration the background to the study, the problem statement, purpose and significance of the study. The research objectives and the research questions that guide the study have also been captured under this topic. Finally, the limitations and delimitations to the study have been taken care of as well as definition of some acronyms that were used in this research work.

1.1 Background to the Study

Colleges of Education in Ghana have discontinued the use of admission tests and interviews for admitting candidates into the Colleges of Education since 2012. Previously, admission into the then teacher training colleges was to a greater extent based on a student's performance at the Entrance examinations which was supervised by West African Examination Council (WAEC) across the country (Adu-Gyamfi & Otami, 2020). Principals of the colleges picked students based on their performance in the entrance examination and interview, but not solely on their academic performance at the West Africa Secondary School Certificate Examination (WASSCE)/Senior Secondary School Certificate Examination (SSSCE). This practice gave way to only interviews at the various colleges when the colleges were upgraded to Diploma status in 2005. Currently, students are admitted directly into the Colleges of Education based on their WASSCE performance due to the fact that the Colleges of Education have been affiliated to the five Public Universities in Ghana and now follow the admission procedures for admitting undergraduate students to the various public universities.

Critics of this direct (open access) admission system are of the view that as a teaching institution, it is appropriate to scrutinise the admission grades and be sure of the knowledge base of the students who offer themselves to be trained as teachers (Kwaa & Palojoki, 2018). This is because following the release of the 2018/2019 results from the WASSCE, some School Administrators, parents, and unsuccessful candidates questioned the credibility and independence of the results. Julius Kontoh reporting in 2019, stated that about 12,000 candidates, representing about forty-two schools across the nation failed in all subjects.(source) Parents and some cooperate organisation such as Africa Education Watch believed that the credibility of the WASSCE is dented. Some Senior High Schools or students, manoeuvre their way through to get excellent grades at the WASSCE (Kwaa & Palojoki, 2018) observed. A paper presented by Ashiagbor (2019) on examination malpractice in Ghana, also revealed that, examination malpractice has become a common practice. Ashiagbor (2019), observed that every examination season witnesses the emergence of new and ingenious ways of cheating. According to a report by International Final Awards and Examiners' Appointment Committee (IFAEAC) (2018) as cited from Ashiagbor 2019, the distribution of candidates involved in examinations malpractices yearly is alarming. Several researchers have bemoaned the prevalence rate of examination malpractice at the WASSCE citing reasons such as pressure of keeping up with high parental expectations of good performance, examination anxiety, lack of educational facilities such as furnished library and equipped laboratory for practical work, inadequate dormitories and hostels especially in some schools, stiff competition among students and schools, societal preference for paper qualification, poor preparations on all major stakeholders as well as poor invigilation of the examinations (Tawiah, et al. 2015; Nyamwange, Ondima, & Onderi, 2013). A report by Enoch Darfar Frimpong in the

Daily graphic in 2013 stated that occurrences of examination malpractices had assumed an alarming trend mainly due to candidates' fear of failing, lack of confidence, laziness, inadequate preparation and inability to apply themselves to their studies (Frimpong, 2013).

Dughah (2016) for instance, lamented that the incidence of examination malpractice in the WASSCE at senior high schools has become an annual ritual, a condition which is of great worry to WAEC, the government, schools, parents and the Ghanaian community as a whole. Even though the Test Development Division (TDD), Test Administration Division (TAD) and Information and Communication Technology Division (ICTD) of the WAEC are trying various technologies to curb the problem, statistics available show that the incidence increases annually (Ashiagbor, 2019). Mashanyare and Chinamasa (2014) is of the view that the incidence of examination malpractices at both the junior and senior high schools could undermine the credibility of examinations by the WAEC.

These reports of the examination malpractices cannot be a mere allegation as WAEC, which is the institution mandated to conduct the WASSCE, has over the years been sanctioning schools and students that are caught in the web of examination malpractices. In 2019, WAEC published names of candidates involved in examination malpractices in the newspapers. Seventeen heads of SHS, supervisors and invigilators were sanctioned for various roles played leading to examination malpractices (Kale-Dery, 2019). Again in 2013, the Graphic online reports indicated that 28 heads of SHSs, supervisors and invigilators were reported by the WAEC to the GES for disciplinary action for their action and inactions that led to examination malpractices in the May/June 2012 WASSCE. In that same report, 3,411 candidates were

sanctioned for their involvement in examination malpractices (Frimpong, 2013). Worrying is the fact that, these student- teachers upon completion of the Colleges of Education are awarded a diploma in basic education certificate which demands a higher remuneration when engaged. It is therefore worth saying that *to whom much is given, much is expected*. More so, researchers have proven that some students opt for the teacher education because of job security and not the passion for it. This was posited by Salifu et al. (2018) and Akpochafo (2020) that personal and social utility values that fall under intrinsic factors were the major reasons why teachers opt for teaching and seek admissions into the Colleges of Education. This is due to the fact that graduate unemployment has bedevilled the country to the extent that students no more follow their passion but they rather venture into the training institutions in order to be recruited immediately after the training (Gyarteng-Mensah, et al. 2020; Dadzie, Fumey & Namara 2020). Such pre-service teachers may not take the training seriously since the passion for it is non- existent. These people can only be identified and probably be disqualified if oral and entrance examinations were conducted after candidates had gotten the WASSCE results.

Ghanaian pupils have been performing poorly in all international assessments as reported in the Organization for Economic Co-operation and Development report (OECD 2018, 2019**)**. The story is not different when it comes to the local examination conducted by WAEC at the Basic School level. This worrisome condition has left many well-meaning Ghanaians and cooperate organisations thinking. One cannot help but to blame the teachers for their instructional delivery prowess (Tawiah, et al. 2015). The question has to do with whether or not the Colleges of Education are churning out teachers who have the needed repertoire of experience, skills and the desire for the teaching profession. Education is the only tool to accelerate national

development, peace and political stability in every country (Sayed & Ahmed, 2015). Teachers, especially those at the pre- tertiary, are supposed to be fortified with the pedagogical content knowledge and skills to be able to teach the young ones in line with the objectives and goals of the new curriculum. That is the only way our pupils can compete internationally.

The admission requirement for a student to be admitted to pursue the Diploma in basic Education Programme at the College of Education in Ghana was for an applicant to obtain (grade A1 to C6) for WASSCE or grade A to D for SSSCE in six subjects including English, Mathematics and Integrated Science / Social Studies. A pass in Mathematics and English is mandatory for all applicants. Applicants who applied to peruse a non-science related programmes are considered for admission based on the better of either Social Studies or Integrated Science. Applicants with more than one examination sittings are also considered for admission based on their best six subjects irrespective of the period in which a subject grade is the better. However, the rejection rate is very high due to the competitive selection nature. This places a lot of students from the less endowed schools at a serious disadvantage because of their performance at the WASSCE. If care is not taken, students may find different means of getting good grades at the WASSCE just to increase their chances of gaining admission into higher education (Onyema et al.; 2019, Board, 2017; Adekunmisi 2021; Ikechukwu, 2020).

The grading system of examinations scores by the West Africa Examination Council for Senior High Schools in Ghana; its comparisons and interpretations

Table 1.1: WAEC grading system and its interpretations for SSSCE and WASSCE

SCORE	SSSCE	WASSCE	EQUIVALENT	INTERPRETATION
75 – 100	A	A1	1	EXCELLENT
70– 74	B	B2	2	VERY GOOD
65 – 69	C	B3	3	GOOD
60 – 64	D	C4	4	CREDIT
55 – 59		C5	5	CREDIT
50 – 54		C6	6	CREDIT
45 – 49	E	D7	7	PASS
40 – 44		E8	8	PASS
0 - 39	F	F9	9	FAIL

Table 1.1 shows the grading system and its interpretation for the results of the WASSCE and the SSSCE for the WAEC. A score in the range of 75 – 100 for SSSCE is given a grade of A while it's A1 for WASSCE. This range of 75 -100 percentage is given a value of 1 which is the highest grade. The interpretation for this range of score is an excellent. A score in the range of 70% to 74% is given a grade of B and B2 respectively for SSSCE and WASSCE. A value of 2 is assigned to this grade and its corresponding interpretation is very good. For a candidate who obtain a score in the range of 65% to 69% are assigned grade C and B3 respectively for SSSCE and WASSCE respectively and a value of 3 is given to represent this range. A score below 40% is graded as F and F9 for SSSCE and WASSCE respectively with the interpretation as "fail". A grade of E is assigned for a score from 49% to 40% for SSSCE with the interpretation as a "pass" score. This range of score is broken into

two for the WASSCE with a score of 45%-49% as D7 and 40%-44% as E8 with the same interpretation as a "pass". Candidates who obtained a score in the range of 64%-50% are graded as D with "credit" as the interpretation. This range is divided into three ranges for the WASSCE in the following; 50%-54% as grade C6, 55%-59% as grade C5 and 60%-64% as C4. The three grades C4, C5, and C6 are all interpreted as "credit" for the WASSCE. A score in the range of 65% - 69% which is interpreted as "good" for both SSSCE and WASSCE has the respective grade of C and B3. An interpretation of "very good" is for the grades of B and B3 respectively for SSSCE and WASSCE for a score in the range of 70% - 74%. The highest grade of A and A1 for SSSCE and WASSCE respectively has an interpretation of an "excellent" for a score in the range of 75% - 100%.

Countries like the United States, United Kingdom and Australia who have trusted systems in place to conduct credible high school final examinations do not rely only on the scores to admit students into higher education (Richardson & Bond, 2012). This is premised on the fact that final examination is not the single best form of assessment of individual's academic success. There are a couple of factors that can influence a candidate's performance either positively or negatively. These factors may include but are not limited to sickness, tension, coalition at the examinations room, compromised invigilation among others. A thirteen-year vigorous research undertaken by Richardson and Bond (2012) revealed that there is a strong correlation between high school Grade Point Average (GPA) and performance at the university. However, other factors such as Scholastic Assessment Test (SAT) / American College Testing (ACT), grade goal and performance self-efficacies are all determinants of a students' performance at the tertiary. What the article puts across is that irrespective of the high school scores, the performance of a student at the tertiary depends on multiple factors

such as personality traits, motivational factors, self-regulatory learning strategies, students' approaches to learning and psychosocial contextual influences. Australia, for instance, has a robust system of admitting students into tertiary education known as the Australian Tertiary Admissions Rank (ATAR). The ATAR is a direct entry system but there is an alternative entry point for mature and Technical students who might not meet the ATAR standard. This one is known as (mature age or Technical and Further Education (TAFE) (Anderton, 2017).

On the issue of teacher education, a high premium is put on the admission, preparation and development of the teaching profession. Countries such as; Canada, Australia, Finland and Singapore have well-developed systems for teacher development. According to Stacy, Talbot, Buchanan and Mayer (2020), proper measures are put in place for teacher recruitment, preparation, induction and professional development through teacher education policies and practices. Finland for instance leapt from a relatively poorly educated nation to a twenty-first-century powerhouse within one generation, the paper noted. This has manifested in their high rankings in all areas on the PISA assessments. Any country that is serious to develop its education system must start from the teacher education. As posited by OECD, (2011) 'the quality of an education system cannot exceed the quality of its teachers and principals' (page 210)

Admission into teacher education institutions have been based not only on high-grade point averages but interviews and the likes. In Finland, according to Dousay (2020), some students resort to volunteer work in the teacher education institutions where they intend to enrol to increase their chances of gaining admission. This is as a result of the competitive nature of the admission process. This is because the Universities

need people who are committed to the teaching profession to enrol to be trained as such. Modern teacher training and preparation focus more attention on invigorating the pre-service teacher with pedagogical thinking skills that enable them to manage the teaching process in a diagnostic manner. The USA has the Interstate New Teacher Assessment and Support Consortium (InTASC) which is responsible for teacher licensing and preparation, according to Dousay (2020).

Ghana is a member of the United Nations organization and therefore a signatory to the SDGs. Therefore, the provision of inclusive quality education for all is a non-negotiable goal. The Ministry of Education has outlined several objectives towards the promotion of the socio-economic development of the country (MOE, ESP 2018). Ghana's philosophy of teacher education, according to (MOE, NTC 2018), is to enhance teacher education institutions to groom teachers who are versatile and fortified with professional skills, attitudes and values in addition to the content knowledge. Teachers are agents of change and therefore need the spirit of enquiry, innovation and creativity. This will enable them to adapt to changing conditions. The UN's agenda for life-long learning requires teachers to use inclusive strategies. In practice, the Ghanaian professional teacher is expected to demonstrate diligence, passion and leadership in the school community as well as the wider community (MOE, NTC 2018). This is because teachers are to be seen as role models as well act in loco parentis (Annan 2020; Ntim 2017).

1.2 Statement of the Problem

Ghana over the years has invested a lot into the Education Sector through various educational policy reforms. The motive is to improve the quality of education in the country, most especially at the pre-tertiary level. Consequently, the teacher education

institutions in the country have been elevated from certificate awarding to degree awarding. However, the impact on the performance of the pupils is yet to be felt. Ghana's performance in the eyes of the global world has never seen any improvement since the last abysmal performance in the TIMSS as observed by Butakor, Ampadu and Cole (2017). Meanwhile, Akropong College of Education and the other Colleges of Education in the country admit pre-service teachers based on high performance at the senior high school without a recourse to interviews or entrance examinations. A cursory look at the students' performance over the years of 2016 to 2019 graduates for the diploma in basic education program has revealed an average attrition rate of over 6% based on poor academic performance, with majority of the students graduating with a Pass or Third Class.

Record of the number of students who were admitted for the years 2013 to 2016 and the corresponding number of those who graduated from 2016 to 2019 with the associated number those who graduated with either a third class or pass from the Presbyterian College of Education.

Table 1.2: The attrition rate at Presbyterian College of Education, Akropong

Admission year	**Candidates**	**Graduating year**	**Graduates**	**Difference**	**Rate (%)**	**Pass and third class**
2013	595	2016	565	30	5.04	159
2014	547	2017	508	39	7.13	148
2015	475	2018	477	-2	-0.42	127
2016	582	2019	547	35	6.01	129

Source: Presbyterian College of Education, Akropong.

Table 1.2 shows the attrition rate at the Presbyterian College of Education, Akropong from 2013 to 2016 admissions who graduated from 2016 to 2019 respectively. The data was taken from the admission records at the Presbyterian College of Education and the Institute of Education from the University of Cape Coast. The highest rate of attrition (7.13%) was the 2014 admission and 2017 graduation years. The 2015 situation was as a result of candidates who were referred in the previous year and were given the opportunity to redeem themselves.

The condition is not different from other Colleges of Educational institutions across the country. Similar results from Wesley College of Education, Kumasi, for the same period gives an average attrition rate of 6.70%.

Record of the number of students who were admitted for the years 2013 to 2016 and the corresponding number of those who graduated from 2016 to 2019 with the associated number those who graduated with either a third class or pass from the Wesley College of Education, Kumasi.

Table 1.3: Attrition rate at Wesley college of Education

Admission year	**Candidates**	**Graduating year**	**Graduates**	**Difference**	**Rate (%)**	**Pass and third class**
2013	310	2016	290	20	6.45	84
2014	310	2017	288	22	7.10	98
2015	430	2018	399	31	7.29	140
2016	430	2019	404	26	6.05	130

Source: Source (Admission records and graduation brochure from the administration of Wesley College of Education)

The Table 1.3 shows a highest and lowest attrition rates of 7.29% and 6.05% for the 2015-2018 and 2016-2019 admission and graduation periods respectively. This performance is not in consonance with the motive of producing highly sophisticated diploma in basic education certificate holders with a repertoire of modern pedagogical knowledge and skills to teach the Basic School pupils in the country.

The continuous deterioration of pupil's performance despite the huge investment has been a source of worry to the players of education in the country and the international community as well. This has mandated the researcher to find out whether a higher performance in the WASSCE alone is a sufficient condition for admission to the College of Education (Oanda, 2020).

1.3 Purpose of the Study

The purpose of the study was to investigate how Pre-services teachers', admitted into the College of Education, performance at the West Africa Secondary School Certificate Examination results relate to their academic performance for the diploma in basic education programme at the Presbyterian College of Education, Akropong.

1.4 Objectives of the Study

This research work seeks to achieve the following objectives:

1. To find out whether there is a correlation between students' performance at West Africa Secondary School Certificate Examination results and the cumulative grade point average of graduating students at the College of Education for the diploma in basic education.
2. To find out whether there is a significant difference in the CGPA for males and females students who graduated from the Presbyterian College of Education with the diploma in basic education certificate.

3. To find out the extent of the overall performance in the West Africa senior secondary certificate Examination results candidates were admitted into the college of education for the diploma in basic education programme from 2013 to 2016
4. To find out the extent of the overall academic performance of the diploma in basic education graduates at the Presbyterian College of Education from 2016 to 2019.

1.5 Research Questions

In order to achieve the objectives stated for the study, the following research questions have been formulated to guide the study:

1. Is there a relationship between students' performance at West Africa Secondary School Certificate Examination and cumulative grade point average at the College of Education?
2. Is there any significance difference between the males and females CGPA for the diploma in basic education?
3. Is there any significance difference among the West Africa Senior High Secondary School Certificate examination results candidates were admitted into the Presbyterian College of Education from 2013 to 2016?
4. Is there any significance difference among the academic performance (CGPA) for the graduates of the diploma in basic education programme at the Presbyterian College of Education from 2016 to 2019?

1.6 Significance of the Study

1. The results from the study will be useful for policy makers and the relevant admission officers at the Presbyterian College of Education, Akropong, for admissions.
2. This research can be important for the Presbyterian College of Education administration quality assurance for revisiting its admission policy in line with the national one.
3. The results may suggest ways of providing individualized support to students who are admitted with different academic background in terms of their gender, performance and programs of study at the SHS level.

1.7 Limitation

There were some impeding factors to the smooth take off of the research work. Prominent among them was the early access to the data for the study from the admission office of the Presbyterian College of Education. The study mainly used pre-service teachers' results both the WASSCE from 2013 to 2016 and that of the Institute of Education, University of Cape Coast, from 2016 to 2019.The private nature of the information needed comes with its own protocols in getting them. The bureaucracy and its unnecessary delays in getting the data was very hectic and demoralizing. It therefore delayed in the data entering of the WASSCE scores to match with the CGPA scores received from the Institute of Education, University of Cape Coast.

1.8 Delimitation

This study involved only students from Presbyterian College of Education, Akropong Akuapem in the Eastern region of Ghana who were admitted from 2013 to 2016 for

the diploma in basic education programme and graduated successfully from 2016 to 2019. Students who did not complete the programme or failed were not included in the study. The study should have included at least all the Colleges of Education in the Eastern Region but for financial and time constrains.

1.9 Organisation of the Study

The research work has been consciously and systematically organized into five chapters. The first chapter focuses on the background to the study, the statement of the problem, the objectives of the study, research question to guide the study, limitation, delimitation and organisation of the study

The second chapter is dedicated to review of scholarly related works. There has been an introspective look and evaluation of both theoretical and empirical reports from educational Journals, publications and other books that contain information relating to the topic of study. The evolution of teacher education in Ghana and its development, different admission requirements into higher educational institutions, performance of pre-service teachers at the college of education for the past decade in Ghana, different performance indicators, means of measuring these indicators and gender and academic performance in teacher education have been captured.

Chapter three dealt with how the research was carried out; that is the methodology. This includes the research design, sample and sampling procedure, the research instrument, data collection procedure and the method of data analysis. Detailed data analysis, findings and discussions from the study have been captured at chapter four. The fifth and the final chapter makes available the summary conclusion, suggestions and recommendation emanating from the research.

CHAPTER 2

REVIEW OF RELATED LITERATURE

2.0 Overview

This chapter evaluates both theoretical and empirical literature. This includes reports from educational journals, publications, reports and other books that contain information relating to the topic of study. The evolution of teacher education in Ghana and its development, different admission requirements and practices into higher educational institutions, performance of pre-service teachers at the College of Education for the past decade in Ghana, different performance indicators, means of measuring these indicators and gender and academic performance in teacher education have been captured.

2.1 Theoretical Framework

Grant and Osanloo (2014) state that theoretical framework is the 'blueprint' for the entire dissertation enquiry that serves as the guide on which to build and support a research work and to provide the structure that will help one define philosophically, epistemologically, methodologically, and analytically approach the dissertation as a whole. Eisenhart (1991) explained a theoretical framework as "a structure that guides research by relying on a formal theory… constructed by using an established, coherent explanation of certain phenomena and relationships" (1991, p.205). In effect, the theoretical framework comprises the selected theory that undergirds the researcher's thinking with respect to how the researcher understands and plans to research a topic. There are many different theories such as psychological theories, social theories, organizational theories and economic theories which may be used to define concepts and explain phenomena in a study.

In their article, Bürgener and Barth (2018) revealed that, the need for sustainable development and societal transformation is gaining more and more relevance, and it is social learning processes that can contribute to real change. As stated in the (UN, 2015) 2030 Agenda and the Global Action Programme are the bedrock upon which education stands on. Education is prioritised because of its usefulness in global peace and development (Lerch & Buckner 2018). To ensure proper education, we must ensure inclusive quality education for all and empower everyone to support sustainable development (Mochizuki, 2019). More importantly, there is the need to enhance the competencies of the multipliers of education (Guskey, 2010, Zwick 2013). There is an increased acceleration of global unemployment, cyber fraud, road accidents, insecurity, natural disasters, and pandemics among others. As a result, our very survival on this earth has become a challenge. It is only through education that we can surmount some of these challenges if not all (Bevington, Kurian & Cremin 2020). But how do we position teacher education to respond to these challenges?

According to Lerch and Buckner (2018), the UNESCO has embarked on a number of policy reforms which aim at positioning teacher education in an enviable pedestal. Noticeable among them are the recently ratified Millennium Development Goals (MDGs) to Sustainable Development Goals (SDGs), otherwise known as the Agenda 2030. The main reason is to ensure that by the year 2030, the 17 set goals would be reached globally. The fourth goal is the one which makes special mention of inclusive quality education for all, and the promotion of lifelong learning. Another move is the Global Action Programme (GAP) which aims at attaining sustainable development by making sure that everyone has the opportunity to acquire the needed knowledge, skills, values and attitudes (UNESCO, 2014). Teachers are the most important determinant when it comes to success in students´ learning. If teachers' competencies

are enhanced, they can create learning opportunities with one greatest potential for learning outcomes (Guskey, 2010).

In view of this, various countries have developed standards for professional teachers. National Board for Professional Teachers Standards lays down what teachers should know and be able to do in the United States (NBPTS 2002). As is the case in Ghana, the National Teaching Council set by an ACT of Parliament (Education ACT 2008, ACT 778) is to improve the professional standards of teachers, register and licence teachers in Ghana.

2.2 Entry into Tertiary Education

According to OECD (2019), more than half of countries and economies with available data on huge budget for pre-tertiary education have majority of their citizens getting access into higher education. This implies that entry into universities across the world are mostly based on a certain minimum qualification level for both public and private institutions. (Alavi 2012; Golnaz, Azizeh & Hossein 2014; Tesema 2014) However, access to certain fields of education can be subjected to some selection criteria in some countries. But in all the national or main examinations taken upon completion of high school education, entrance examinations administered by tertiary institutions are the dominant standards for entry into the first-degree tertiary programmes (Chathuranga 2016; Baker, Ulpen & Irwin 2020). In some jurisdictions, work experience is also considered for admission into tertiary institutions. The criteria most universities used for admission to public tertiary institutions are grade point averages, candidate interviews and work experiences. (Kapinga & Amani 2016; Zezekwa & Mudavanhy, 2011)

Education at a Glance (OECD, 2019) has taken retrospective look at the investments that countries have made into education and the outcome these investments have yielded. The report is based on the SDG Goal 4 which encompasses access to education, participation and progression. It focuses on the full education system from early childhood to tertiary education with particular attention on Teacher education. Teachers are the change managers, there is therefore the need to assess the factors that can impede or enhance their activities. The factors include the learning environment and organisation of schools, instructional time, teachers' working time and teachers' salaries. These indicators not only represent policy levers that can be manipulated, but also provide contexts for the quality of instruction and for the outcomes of individual learners. The OECD monitors and reports on the pathways that youth can take throughout their journey in life through education. Particularly, the transition from High school to higher levels of education, and their progression through higher levels of education, and from education into the labour market (Cyrenne & Chan 2010; Aidoo-Buameh & Ayagre 2013; Zlakin-Troischankaia & Schlax 2020). This is because the UN believes that it is only education that can propel individuals to acquire the skills needed to contribute meaningfully to society.

2.3 History of Teacher Education in Ghana

Teacher Education in Ghana dates back to 1848 with the establishment of the first Basel Mission College (the Presbyterian Training College) as posited by Asare-Danso (2014). The various educational policies that were introduced then have served as the blueprint which guides curriculum development and implementation, as well as the management of teacher education delivery in Ghana. Even though the mission's educational policy sought to promote the interest of its activities and that of the mother country rather than our beloved country, it has been a great asset to us. Ghana

has been able to take advantage of the opportunity provided by the colonial masters to reposition itself to providing a world class teacher education to enhance smooth quality education for all.

The journey of teacher education in Ghana has never been a smooth one, however with political will and concerted efforts by some great academicians, the process has never been stagnated. Researches have revealed that, the programmes offered at the college started from a 2-year post primary and navigated through 3-year post primary, 4-year post primary, 4-year post middle, 2-year specialist, 2-year post-secondary, 3-year post-secondary, 3-year certificate "A", 3-year diploma in Basic Education and 2-year diploma in Basic Education and now 4-year B.Ed (Acheampong & Kayange 2017; Adu-Gyamfi & Otami 2020). This is as a result of various policy reforms and educational reviews. As observed by Anamuah-Mensah and Benneh, as cited by Asare & Nti, (2014) the teacher education was following a traditional system which was not dynamic enough in producing quality teachers to face the challenges being posed by the emerging technologies. The reforms after independence as posited by the Ministry of Education yielded little impact on students' learning outcomes (MoE, 2012). This is because students' achievement and development of critical values like problem solving, innovative thinking and creative skills were deficient.

In order to rectify the ills in the curriculum and its implementation, two pieces of major legislation related to teacher education preparation which were aimed at transforming the country's educational system were passed. The Education ACT 2008 (ACT 778) which gave birth to the National Teacher Council (NTC) is mandated to register and license teachers and also see to the professional development of the Ghanaian teacher. The Education ACT 778 is bent on making teaching in Ghana a

profession with clear codes of ethics and minimum acceptable competencies of those who get to teach at the pre-tertiary institutions in the country. This is to ensure that teachers in the country get the needed pedagogical content knowledge and skills to be able to train the young ones to compete anywhere in the world.

Another move was the passage of Colleges of Education Act 2012, Act 847 which provided the legal background for the elevation of the status of TTCs to COEs. This has now placed the CoEs under the tutelage of the National Council for Tertiary Education (NCTE). The colleges have since been under the NCTE, a role which was previously the reserve of the Ghana Education Service (GES). Even though the legislation was passed in 2012, the full implementation took effect in 2018.

Prior to the implementation of the current teacher education reforms in 2018, the preparation of pre-service teachers for the basic school level followed a dual mode where both content and methodological courses were taken within the stipulated period of the programme. In this structure, prospective teachers took a number of content courses as well as the pedagogical courses concurrently (Adu-Gyamfi & Otamni, 2020). The Diploma in Basic Education programme was structured to allow for three types of prospective teachers. There are those who are trained in a Generals course. This group of pre-service teachers will be able to teach all subjects at the Early Grades (Basic 1 to 6). There is another group who offer the Early Childhood course. They are trained specifically for the preschool pupils. And the last group who undertake the Specialist Course. Those pre-service teachers are supposed to handle the Junior High schools upon completion of their course.

The Diploma in Basic Education programme was structured to provide three competency areas to be undertaken by the prospective teachers. These are the content

of various subject to be mastered by trainees. These subjects are mostly the subject being offered at the Basic Schools of which trainees are expected to teach upon assumption of duty. The next one is the methodology courses to equip prospective teachers with the pedagogical skills and professional development to deliver the content. The final one is the practical session which comes in two folds; on-campus teaching practice and off-campus teaching practice. Both practices are well structured and supervised by the school to provide field experience, opportunity for perfection as well as boosting the self-confidence of the individual pre-service teacher. The Diploma in Basic Education programme comparatively galvanised all the vital knowledge and skills that a modern teacher requires to teach. However, there was the need to step it up to meet international standards where most countries in the world require a minimum of a First degree to teach at the Basic schools (Kwaa & Palojoki 2018; Acheampong & Kayange 2017). Hence the introduction of the Four-year Bachelor of Education programme.

Findings from the OECD Innovative Learning Environments (ILE) Project (Organisation for Economic Co-operation and Development (OECD, 2013) reveals that teacher education must be restructured to accommodate the needs of today's learners. Conner and Sliwka (2014) demonstrated the need to adhere to the seven transversal learning principles by the ILE work for initial teacher education. This is the only way pre-service teachers will be effective in their learning and the environments in which they will be expected to teach.

Another crown call was the need to harmonise the CoE training programme with that of the other tertiary institutions who have been accredited to run teacher education programmes in the country. The University of Education, Winneba (UEW) and the

University of Cape Coast (UCC) run both regular and distance programmes for pre-service teachers. The Institute of Education had developed a common curriculum that the CoE were following but there were some variations when it comes to that of the tertiary institutions as they seem to follow different pathways. One of such variations has to do with the practicum, whiles the CoE provide a yearlong school-based teaching practice in addition to a semester long campus-based peer teaching for Diploma in Basic Education (DBE), University of Cape Coast (UCC) had only a Semester long school-based teaching experience for Degree in Basic Education (Asare- Danso 2014**).** Such variations were perceived to have implications on the learning experiences of prospective teachers hence the need to find a common approach in the teacher education dispensation in the country. This led to the development of the National Teacher Education Curriculum Framework (NTECF, MOE, 2019) under the guidance of the National Council for Tertiary Education (NCTE).

2.4 Concerns with Initial Teacher Education Curriculum

The numerous reforms in the teacher education system in Ghana in the recent decades have had little impact on children's learning outcomes according to Abakah, (2019) as cited in (NTECR, MOE, 2018). This is because the teacher education curriculum has not adequately responded to the lack of improvement in learning outcomes at the basic school level. The curriculum for teacher education is weighted heavily towards subject-content knowledge to the detriment of curriculum space for developing understanding of pedagogy and practical classroom teaching skills (Armah, 2017). More so, there exists a lack of connection between the initial teacher education curriculum and the Primary, JHS and SHS curricula. Courses in Mathematics, English and Science focus far more significantly on content that is not required to be taught at

primary, JHS and SHS level. Again, the concerns and needs of today, that is, of the 21st century, are not reflected in the teacher education curriculum which makes it outmoded and old fashioned. Although teacher education provides structures and expectations of mentor support and practicum placement, mentoring, visits by subject specialists and pre-and post-supervisory conferences rarely occur as intended. The assessment system in the initial teacher education curriculum was found to be too information-oriented, extremely quantitative and lacks comprehensiveness. It is also summative with 60% assessment by examination and 40% continuous assessment which can consist of a few quizzes and an assignment. The student's progression depends on success in the examinations. This makes the curriculum both theory laden and examination focused, thereby preventing students from developing appropriate pedagogical skills. The teacher education programmes lacked the impetus to develop the attitudes, values, dispositions, habits and interests of teachers (Nketsia, Opoku, Saloviita & Tracy 2020) since the curriculum had no mechanism in place for assessing the above-mentioned areas.

2.5 Rationale for the New Curriculum for Teacher Education

There have been constant and consistent recommendations by the international communities (Foy, Fishbein Von Davier & Yin 2019) for encouraging the development of transversal skills such as problem solving, critical thinking, creativity, collaboration, communication, innovation, entrepreneurship, digital literacy among others (Larraz, Vazquez & Liesa 2017; Tam & Trzmiel 2018). The need for these mechanisms to embed in the ITE to enhance productivity in the twenty-first century was a contributory factor to the development of a new curriculum (Yasin, *et. al* 2012; Sarkodie *et al*. 2018; Adu-Gyamfi & Otami 2020).

According to Abudu and Mensah (2016) the coming into force of the National Teachers' Standards (NTS, 2016) and the Pre-tertiary Teacher Development and Management (PTPDM) policies further deepened the call for change in the teacher education programme in the country. The National Teachers' Standards (NTS) set out the minimum levels of practice that all trained teachers must reach by the end of their pre-service teacher education course in order to play a critical role in inspiring and challenging all pupils to achieve their potential. There was also the need for all initial teacher education to provide the opportunity for student teachers to fully meet all the standards of NTS. This and many other pressing issues demanded a new Curriculum Framework for the Initial Teacher Education (ITE) in the country. Thus, to prepare competent qualified and dedicated teachers to handle the country's pre-tertiary education (TEMAG 2014b; Ntim 2017). Hence the introduction of the Teacher Education Curricula which gave birth to the 4-year Bachelor of Education (B.Ed) programme. This new curriculum is presented in terms of the four pillars and the cross-cutting issues which have been explicitly designed intended to prepare effective, engaging and inspirational teachers. The four pillars espouse in the National Teacher Education Curriculum Framework by the Ministry of Education, co-sponsored by the T-TEL (Transforming Teacher Education and Learning) are Subject and Curriculum Knowledge, Literacy Studies, Pedagogic Knowledge and Supported Teaching in Schools (Armah 2018).

The driving force for this innovation is the desire to produce teachers who can inspire learners and encourage critical thinking, problem solving and creativity rather than simply focusing on factual recall and computational algorithms to pass examinations (Ntim, 2017). The B.Ed programme has been designed to ensure that, it produces a cadre of skilled, knowledgeable and motivated Ghanaian teachers to meet the

standards of the NTS (www.t-tel.org). All the 46 CoEs in Ghana have been resourced to deliver this mandate (Armah 2018). To ensure smooth implementation and sustainability, the CoEs have been affiliated to six public universities in the country. No wonder the team of international assessors of the B.Ed. programme in Ghana described it as "World Class".

2.6 Category of Teachers in Ghana

All teachers in the pre-tertiary education sector are categorised into professional and non-professional teachers (MOE, 2012). The minimum teaching qualification of professional teachers for basic school level had been the Diploma in Basic Education obtained from an accredited College of Education (CoE) in Ghana (Armah 2017; Institute of Education, 2016). The minimum teaching qualification of professional teachers for second cycle level is a Bachelor's degree in Education designed in the appropriate subject(s) for that level, or a Bachelor of Arts or Bachelor of Science, in a teaching subject, in addition to a post-graduate diploma in education (PGDE) or its equivalent (Acheampong, 2017). The other category is the non-professional teachers grouped into two: persons holding the Senior High School (SHS) certificate with three credits including English and mathematics and persons with diploma from accredited polytechnics (now technical universities) and university graduates without certificate in education (MoE, 2012). Buabeng *et. al*. (2020) argues that the situation raises concerns about the professionalism of teaching in Ghana considering that any graduate with any academic qualification can be employed to teach. Also, there are various pathways that an individual can use to enter the teaching profession (Buabeng et al., 2020). The first group is those who have the Diploma in Basic Education (DBE). The accredited Colleges of Education (CoE) were responsible for the training of these teachers to teach at the basic school level. There are some teachers who were

offered a two-year DBE (sandwich) program to upgrade their teacher's Certificate "A". These teachers had received the initial professional 3-Year post-secondary qualification from the then TTC (Asare & Nti, 2014). The UCC designed the program to upgrade such teachers when the TTC were upgraded to CoE and were awarding DBE. Similarly, there are others who obtained a Four-year distance education leading to the award of DBE. These were teachers who had not received the initial teacher education but were employed by the GES due to shortage of professional teachers then. The programme was christened Untrained Teacher's Diploma in Basic Education (UTDBE) for practicing teachers who have not received initial professional teacher training (non-professional teachers with senior high school certificate). This programme was organised in the CoE in partnership with the Teacher Education Division (TED) of the Ghana Education Service as a means to enhance the knowledge and skills of those teachers (Asare & Nti, 2014).

Another category is the cadre of teachers who possess Bachelor's degrees. This includes those who offered a Two-year post-DBE (for basic school teachers) programme at the UCC or UEW. The programme was designed for teachers who already possess the DBE. These teachers obtained the degree through Sandwich or Distance Education system. The other group of the degree holders are those who pursued the Four-year bachelor's degree (for both basic and second cycle schools) at the universities. These are graduates from mostly the University of Cape Coast and University of Education, Winneba. That is, while the CoE prepared teachers who graduated with a DBE to teach at the basic school level, the two traditional teaching universities offered degree programmes for prospective teachers at this level. The next crop of teachers are those who are currently undertaking the Four-year B.Ed programme which will lead to the award of a Bachelor's degree (Quansah &

Ankomah-Sey 2020). The programme has been designed to train professionals for specific roles. These includes the B. Ed Early Childhood Education for the pre-school, B.Ed General (with specialisation in Primary and Junior High School), B.Ed Science and Mathematics and B.Ed French. The first batch is expected to graduate in 2022.

2.7 Gender and Academic Performance in Teacher Education

Research has shown that females face a lot of challenges that can affect their academic performance (Britt et al., 2020). These challenges if left unattended to can have a debilitating impact on the country's education sector. Practically there have been several legislations to ensure the protection of the girl child against any form of harassment, abuse or discrimination. All these aim at helping the girl child compete favourable with their male counterparts when it comes to academic performance.

For instance, the Ministry of Education, its agencies and stakeholders have put strategies in place to deal with existing and future challenges of gender in the education sector. Notable among these is the Education Strategic Plan, 2010 – 2020, which has Gender Equity (GE) and Women Empowerment (WE) concerns such as girls educational issue at all levels of education particularly the basic level, the use of female role models among others (MOE. ESP, 2019). Moreover, the National council for Tertiary Education has developed a framework on how to help students of the public colleges of education live free from sexual harassment (ncte.edu.gh). All these are measures to ensure that the female get the conducive atmosphere to learn.

The Ghana MDG report (2013) observed that, Ghana continues to make progress towards achieving gender parity at all levels of formal education. To eliminate gender disparity in primary and secondary education, preferably by 2005, and in all levels of education no later than 2015, the Ghana MDG report (2013) further states that,

Gender Parity in schools in Ghana is closest to being achieved at the primary level, where the net enrolment rate in 2011 was 84.04 for girls and 83.77 for boys. The literacy rate for young women has increased considerably with these policies: from 66% in 2000 to 79.9% in 2010. The overall literacy rate for females stands at 61.2% in 2010 due to regional disparities. (National Gender Policy, 2015).

Researches continue to prove false many past beliefs that males perform better than females (Abubakar, 2010; JICA 2013; OECD, 2019). Britt et al., (2020) for instance revealed that academic performance was nearly the same for males and females. The argument continues as Armah, Akayuure, Armah, (2021) found that there were statistically significant differences in the achievement of Mathematics between male and female distance learners in each of the three years with the males attaining higher grades than their female counterparts. To this end many investigations are being carried out to ascertain the reality when it comes to parity in performance at the colleges of education for males and females.

The enrolment statistics from the Colleges of Education has demonstrated that more and more females are entering colleges to be trained as teachers. MOE ESP, (2018) revealed that the female student at the public Colleges of education stands at 46.70% whiles those at the Private sector constitute 50.43% (MOE, ESP, 2018 pg 43). The Government of Ghana is making a lot of efforts in ensuring that gender parity is achieved in both enrolment and performance at all levels of education in the country. Below are some of the strategies;

a. Increase commitment and allocation of adequate resources to consolidate gender parity in all schools starting from enrolment and retention in challenging areas and communities.

b. Promote school attendance by enabling relevant sectors and agencies to address specific needs of girls and boys especially relating to school environment and attendance. These include gender based violence in schools; sexual harassment in school; personal care and development; safety and protection.

c. Promote and enforce the availability of female teacher role models in schools and communities starting with rural and less endowed schools.

d. Review and enforce re-entry policies for pregnant school-girls to enable them continue their education after delivery. Regarding this, there is therefore the need to enforce the teaching of age-appropriate education to girls and boys on sexuality and reproductive health and rights in school curricula, including issues of gender relations and responsible sexual behaviour, focused on preventing teenage pregnancies.

e. Develop and implement scholarship schemes for the girl child and ensure girls are retained in school to complete and move on to the next levels to avoid being victims of child and early marriage and motherhood situations that disempowered them.

f. Develop and implement national programmes and district based projects to facilitate continuous education and livelihood for young boys and girls trapped in the transitional gaps between Junior High Schools (JSH) and Senior High School (SHS), and SHS to Tertiary Levels.

g. Develop and promote an all-inclusive and accessible education for persons with disability.

h. Sensitize parents, families and stakeholders in communities to send children with disability to school and stop hiding them.

i. Provide standard sanitary facilities for the girl-child in schools and sensitize them on personal/ menstrual hygiene. Source (Ministry of Gender, Children and Social Protection (MoGCSP) National Gender Policy, 2015).

2.8 Some Factors that Affect Academic Performance

Major stakeholders in education all over the world are interested in the products that come out from all levels of education. Sayeed *et. al* (2013) and Namale & Buku (2014) explained that education is a systematic process that seeks to produce well balanced individuals with the requisite knowledge, skills, values, aptitudes and attitudes to become functional and productive citizens for national development.

Thomas & Rugambwa (2011) posit that the provision of education for all children has been a focus of many Governmental and Non-Governmental Organizations. Some countries show an equitable balance in primary education achievement and others face difficulties in meeting educational objectives either for boys or for girls. Lugayila (2014) points out that Sub-Saharan Africa (SSA) is among the few regions with comparatively poor academic performance of girls in their final primary education examinations compared to boys.

Mupa (2015.) defined an ideal environment as one in which girls and boys feel safe and are able to achieve their full intellectual, physical, and emotional potential in whatever that respects differences in gender, inabilities in kind and degree in culture while Cohen (2016), describes school as an institution, with specialized personnel apparatus, formal and stereo typed means of instruction, a curriculum and rationally defined manifesto objective, Cohen further noted that schools intended so that pupils may learn things and do so under the guidance of the teachers. Okwach & Anyango (2005) reported that harsh school and classroom, environment including sexual

harassment of the girl pupil by male teachers were common practices experienced in urban public primary schools in Abuja.

Aloyce M.C. (2021) identified four key environmental factors as contributing to the low academic performance of students, especially the female in schools;

1. Harsh school environment: School environment factors for the surveyed schools are not friendly to students and that it contributes to their poor academic performance although the extent of poor performance was not studied.
2. Pest teachers; Harsh school and classroom, environment including sexual harassment of the girl pupil by some male teachers were common and that more than 1,000 teachers had been sacked in Kenya for sexually abusing school girls in the past two years.
3. Longer distance from the school; Lockheed and Vespoor (2016) agree with Aloyce M.C. (2021) that children who lived a long way from school are prone to absenteeism and fatigue. This particularly increased the constraints for girls and it affected their school attendance and concentration in class and therefore affects their academic performance.
4. Inadequate facilities; Kwesiga (2013) and Aloyce (2021) noted that school facilities determined the quality of the school which in turn influenced the achievements and attainment of its students. Knutzen and Smith (2012) referencing from UNICEF (2012) report stated that, recent studies have pointed to the fact that lack of privacy for girls such as the absence or poor toilet facilities contributed to periodic truancy and ultimately led to some girls dropping out of school.

2.9 Performance Indicators at the College of Education

Table 2.1: Grading System at the Colleges of Education

Marks	Grade	Interpretation	Credit value
80 – 100	A	Excellent	4.0
75 – 79	B+	Very Good	3.5
70 – 74	B	Good	3.0
65 – 69	C+	Average	2.5
60 – 64	C	Fair	2.0
55 – 59	D+	Barely Satisfactory	1.5
50 – 54	D	Week Pass	1.0
Below 50	E	Fail	0.0

Source: Institute of Education, University of Cape Coast

From table 2.1 academic performance of students is divided into eight sections with the corresponding grades and credit values. A score above 80% and above is awarded a grade A with a corresponding credit value of 4.0. A candidate that score this grade is described as an excellent candidate. A grade B+ is assigned to a candidate's score ranging from 75% – 79%. The corresponding credit value of 3.5 is assigned to such a grade. A candidates with this range of marks and credit value is described as a very good candidate. 3.0 is the credit value for a grade B which represents a score ranging from 70% to 74%. Any candidates who obtains this grade is described as a good candidate. A candidate who obtains a score within the range of 65% to 69% is given a grade C+ Grade C+ is assigned a credit value of 2.5 and the candidate that obtains this grade is described as an average candidate. If a candidate scores a mark in the range of 60% to 64%, the candidate is assigned a grade of C and a value of 2.0 is given for such a range. Such a candidate is described as having performed fair. A grade of D+ is assigned to a candidates who score a mark in the range of 55% to 59% and a description of barely satisfactory is used for that candidate. Grade D, which has a

credit value of 1.0, is assigned to a candidate's score within the range of 50% - 54%. Such a candidate is described as a candidate with a weak pass. Any candidate who scores below 50% has a credit value of 0.0 and the grade is E.

2.10 Determination of the final GPA (CGPA)

Students CGPA are calculated from the various GPAs of the various semesters. The GPAs of each semester depends on the number of courses a student studied and wrote examination during the semester. To determine the GPA for a particular semester, the credit value of the grade for each course is multiplied by the corresponding credit hours assigned to the course for the semester. The sum of these products for the particular semester are found and the results divided by the total credit hours for that semester to obtain the GPA for that particular semester. The final GPA (CGPA) is obtained by dividing the sum of all the products of the credit values by their corresponding credit hours for the whole program by the total credit hours for the program. The table indicates the categorisation of the grading system for the Diploma in Basic Education program at the CoE.

2.11 Categorisation of the grading system for Diploma in Basic Education

Table 2.2: *Cumulative grade point average interpretation*

CGPA	Interpretation
4.0 – 3.6	First Class
3.5 – 3.0	Second Class Upper
2.9 – 2.5	Second Class Lower
2.4 – 2.0	Third Class
1.9 – 1.0	Pass
Below 1.0	Fail

From the Institute of Education, University of Cape Coast

From Table 2.2, a student who completed a program of study and obtained a cumulative grade point average within the range from 3.6 to 4.0 is awarded a first class honours. A second class upper is awarded to a student who completed a programme of study with a cumulative grade point average in the range of 3.0 to 3.5. A candidate who completed a programme of study with a cumulative grade point average of 2.9 to 2.5 is awarded a second class lower honours. A third class is awarded to a candidate who completes a programme with a CGPA within the range of 2.4 – 2.0 while a CGPA in the range of 1.9 – 1.0 is awarded a pass. A cumulative grade point average below 1.0 for a candidate after completing the diploma in basic education program is awarded a fail.

2.12 Pre-service teachers' academic progression

Dagila (2010) researched on performance of students in the Senior School Certificate English Language examination as a predictor of performance in use of English course at the university. The researcher used a sample size of six hundred and seventy-five (675) students drawn from government owned secondary schools in Katsina State, Nigeria. The instruments for data collection were the students' scores in the Senior School Certificate English Language examination and their scores in the Use of English course. The researcher concluded that poor performance of students in English in the Senior School Certificate does not mean that performance will be poor in the Use of English course at the university. Geishina (2008) studied students' achievement in the Senior School Certificate English Language examination to find out if the achievement correlates with that of Use of English at the tertiary institution. The study involved seven hundred (700) students from three universities in the Middle Belt Zone of Nigeria. The result of the study showed that there was correlation between achievement in the Senior School Certificate English Language

examination and that in the Use of English course. This means that those who did well in the Senior School Certificate English Language examination also did well in the Use of English course in the university. Çökük and Kozikoğlu (2020) conducted a study aiming to analyse the relationship between school readiness and adaptation problems of first-grade students in primary school and it was concluded that there is a high level, negative and significant relationship between primary school first-grade students' school readiness and school adaptation problems. Accordingly; a high level, negative and significant relationship was found between students' adaptation problems and school readiness scale's sub-dimensions of cognitive skills, affective skills, psychomotor skills; a medium level, negative and significant relationship was concluded between students' adaptation problems and self-care skills.

Regression equations predicting the CGPA in essence predict an average grade for individuals with particular values on the predictors. The prediction will not be correct for a student who takes mostly leniently graded or stringently graded courses—the predicted grade will be too low or too high. Ramist, Lewis, and McCamley (1990, p. 261) studied grading standards for first-year college grades and found that there was more than one grade point difference (on a 4-point grading scale) between the most leniently graded courses and the most stringently graded courses. The lower uncorrected correlation found by Elliott and Strenta in the senior year (0.41) as compared to the first year (0.57) was explained by Willingham's (1985) finding that able students tend to migrate into stringently graded majors while less-able students migrate into leniently graded majors. They concluded that students with very different levels of accomplishment and knowledge receive similar GPAs in their major subject areas. This increased relativity of grading standards would lower observed correlations (Armah 2018). (Den Brok, Wubbels, Van Tartwijk 2017) found that the

rates of graduation at different institutions were predictable, although whether or not a given individual would graduate was generally not predictable. In his nine-institution study, a variable identifying which institution the student attended raised the correlation of preadmission measures with graduation from 0.3 to 0.4. This result was also observed by Adam et al. (2021). Willingham found very low correlations within individual institutions. The average correlation between preadmission predictors and graduation within an institution is not significant different from institutions studied (Bok & Bowen 2019) Quansah & Ankoma-Sey, (2020).

Admission practice has valued a range of academic and non-academic outcomes (sometimes tacitly) and has traditionally considered a range of academic and non-academic credentials. Selective colleges are known to consider many factors besides academic qualifications because most of their applicants have high test scores and high school records (Blackburn, 1990). The private liberal arts colleges studied by Willingham (1985) varied in acceptance rate from about 20 to about 90 percent, and they varied in the percentage of applicants with SAT scores over 600 from less than 10 to about 60 percent. All nine of these colleges considered a variety of academic and non-academic factors in selection.

The methods of considering other factors vary widely from college to college, and the specific factors considered and the subset of factors most valued also vary (Blackburn, 1990). The ratings may be narrative, numerical, or both; the evaluation may be holistic or focused on details; they may be done by admission professionals or faculty or both. In general, however, these evaluations have several elements in common. They are based on a reading of the entire admission file (and thus the effect of any specific student quality is difficult to determine), and they are based on

professional judgment. In their study of Personal Qualities and College Admissions, Willingham and Breland (1982) found that intended weights on areas of achievement and background were not always consistent with the weights that predicted actual admission decisions. A major challenge is to develop effective connections between admission practices and a broad conception of college outcomes. A solid beginning was made in Willingham's 1985 study entitled Success in College, which developed individual institutional definitions of success in collaboration with nine participating undergraduate institutions; developed outcome measures; proposed possible predictors of success; gathered these indicators for an incoming class; monitored its coded by trained research staff. The criteria of success were defined by institutional committees, and students were nominated in the categories of success by faculty.

2.13 Professional development in College of Education

The Colleges of Education in Ghana have been involved in a continuous professional development for over four years with support from Transforming Teacher Education and Learning (T-TEL). A report from National Academies of Sciences, Engineering and medicine in 2015 stated that with the changes in the educational sector brought about largely by technology coupled with government reforms, all teachers will require some new knowledge and skills which comes in a form of professional development applicable to both experience and beginning teachers.

According to Darling-Hammond and Richardson (2009), teachers' ability to teach the 21st century skills needed by students, will depend on a more effective professional development which is sustainable, job-embedded and collaborative. Luft and Hewson (2014) posit that professional development is an on-going learning experience which begins and end with the teachers' career. Wilson and Berne (1999) concluded in their

work that reforms in education are done with believe that changes in curriculum would lead to changes in teaching practice. This calls for new ways of teaching with professional development as key driver of such reforms that sets school improvement in motion. Soine and Lumpe (2014) make a strong recommendation by stating that professional development is generally recognized as essential when it comes to introducing educational reforms.

Soine and Lumpe (2014), van Driel, *et al* (2012), Wilson and Berne (1999) with Desimone (2009) asserting that teacher learning and for that matter professional development is an essential focus when it comes to educational reforms. This is because educational innovations and reforms demand changes in classroom practices. It is therefore appropriate to reason that attempts to bring innovation and reforms in education are accompanied by professional development programmes. Van Driel, *et al* (2012) assert that teachers will need a great deal of learning which mostly come in a form of professional development to be able to meet demands expected of them during such reforms. Professional development can provide a lot of benefits to the teachers in terms of boosting their confidence, providing opportunity for them to experience and apply some new skills, and improving their content and pedagogical knowledge. Price & Chiu (2018) assert that professional development is considered as an important process to reforms in teaching and learning. Professional development enhances effectiveness of teachers bringing about improvement in teacher quality thereby improving educational outcome. Kang, Cha, and Ha (2013) maintain that teacher professional development can influence teachers' learning, instructional practice and students learning. Therefore teacher professional development is essential for school improvement.

Professional development can also be provided as boot camps, seminar series, mini courses, webinars, hands-on workshops, peer training, or meetings with experts (Gosselin et al., 2016; Johnson et al., 2012; Meyer & Murrell, 2014; Reilly, Vandenhouten, Gallagher-Lepak, & Berg, 2012; Roby, Ashe, Singh, & Clark, 2013; Signer, 2008; Wang, 2007). These professional development opportunities can be more meaningful if they are designed based on the content that participants find applicable and useful (Walters et al., 2017). Some researchers also support the idea of individualized and customized training (McQuiggan, 2012; Rhode, Richter, & Miller, 2017; Wingo, Peters, Ivankova, & Gurley, 2016), while others emphasize the importance of regularly scheduled, standardized trainings (Meyer & Murrell, 2014).

However, only a few existing studies relied on modelling best practices for online teaching and learning through the delivery of online professional development. This is consistent with the overwhelming prevalence of face-to-face delivery of online teacher professional development as described in a national study of 39 higher education institutions (Meyer & Murrell, 2014). While it might take some instructors longer to adopt online teaching (e.g., McQuiggan, 2012), the aforementioned studies reported that online professional development increased knowledge and improved faculty perceptions. For instance, Ginzburg, Chepya, and Demers (2010) reported that the majority of faculty felt confident in their ability to develop and teach in an online environment after an 8-week online cohort program. In their study, cohorts consisting of 8–14 faculty members participated in the course led by staff from the Office of Instructional Technology. The authors attributed positive learning outcomes to the fact that faculty were able to experience online learning from the perspective of a student. Rienties, Brouwer, and Lygo-Baker's (2013) analysis of pre- and post-tests found that, in addition to increased confidence, the 33 participants demonstrated

significant increases in TPACK knowledge following completion of four online modules designed to improve faculty's ability to teach online. The modules were designed to last 8–12 weeks, allowing flexibility and autonomy for instructors to complete the work and reflect on their progress. Similar improvements in TPACK as well as increased satisfaction were found in another study by Rienties et al. (2013). As online learning technology continues to develop, little information exists on the effectiveness and preference of an online format to foster interactive professional development for instructors preparing to teach online (Elliott et al., 2015; Norton & Hathaway, 2015).

A national effort is on-going to transform and upgrade teacher educational programmes in Ghana to produce high quality teachers for the country T-TEL (2017). The Government of Ghana has aimed at overcoming the poor learning outcomes and identifies teaching both as a hindrance and solution to that progress. It has therefore instituted a four-year programme called Transforming Teacher Education and Learning (T-TEL) with the financial support of £17 million from the UK government which is aimed at transforming the pre-service teacher education in Ghana by improving the quality of teaching and learning in the country. T-TEL seeks to initiate a reform programme to instigate effective professional learning for college tutors and student teachers with the view to developing professional teachers who are well-equipped with knowledge, skills, and the disposition to learn, and who will guide their pupils to achieve the learning outcomes of the national curriculum in basic education. The intended outcome of the programme is the development of beginning teachers who demonstrate interactive, student-focused instructional methods, who demonstrate gender-sensitive and student-centred instructional strategies, and who know and can apply the school curriculum and assessment (T-TEL, 2017; p.9).

In view of the reform of teacher education in Ghana, ongoing professional development sessions have been instituted for the tutors of the colleges of education. The main reason behind the professional development is that an intervention to improve tutors teaching skills will lead to changes in the behaviour, delivery performance, and teaching skills of student teachers (T-TEL, 2017; p.10). This implies that as College tutors learn and adopt interactive and student-centred instructional strategies, the pre-service teachers will also teach using these students-centred approaches as they have experienced in their training. T-TEL provides support for the college based professional development of the tutors. This is a weekly professional development session which is organized in every semester to improve teachers teaching practice. The programme which was started in 2015 has been sustained till now.

2.14 Presbyterian College of Education, Akropong Akuapem

Information from the 170th anniversary brochure (June, 2018) provides the following information about the Presbyterian College of Education The Presbyterian College of Education, which is located in Akropong Akuapem of the Akuapem North municipality in the Eastern region of Ghana, formally known as Presbyterian Training College was established on 3rd July 1848 by the Basel Missionaries who had then established the Presbyterian Church in 1882. It is the first and oldest higher institution of learning in Ghana and second to Foura Bay College in Sierra Leone, in West Africa. It remained the only higher institution of learning in Ghana (Gold Coast) for almost fifty years after its establishment in 1848. The Presbyterian College of Education began as a Seminary with the core mandate to equip teachers with sound basic education and sound attitudes necessary for living exemplary lives. Strict discipline was key to their training and this reflected in their lifestyles. In 1850, at a

meeting of the European missionaries at Akropong, a decision was taken which laid down rules for selecting candidates for admission into the Teachers' Seminary. The first rule was that one should be admitted if he has been baptised. The second rule states that those who have received baptism on pillow or who want to be trained teachers but did not want to be trained to preach were not to be admitted in the college. To them such people give trouble to the Church afterwards as they have no interest in the Church. Later the Seminary became a separate entity and the Training College's main mandate to train teachers continued. In the year 2006, the Presbyterian Training College was among the Training Colleges in the country that were promoted to tertiary status to run Diploma in Basic Education Programmes. In the first one and half decade of the College, from 1848 to 1863, the lower level of education were not adequately developed and therefore, fewer years were spent in the acquisition of the basic knowledge of reading, writing and working with numbers. Students within this period had to spend the first three years in the seminary in further work in:

i. Reading lessons in the English Bible and in Twi language
ii. Translation exercises from English to Twi
iii. The study of English grammar
iv. Spelling lessons , both in English and Twi
v. Calligraphy
vi. Arithmetic
vii. Geography
viii. Hymn singing

In 1863 the College started a course in theology and therefore, other subjects such as Greek, Hebrew, Dogmatic, Homiletics and others were taught. Later, practical courses

such as gardening, blacksmithing and wood work were introduced. The first batch of students who were admitted on July 3, 1848 completed their course on April 27, 1853.

After 1863 the College run a four year course for students who were admitted into the college. Until 1958, the College remained a male institution. In 1958 the last white Principal of the College, Rev. Noel Smith admitted 17 women into the College. Currently the Presbyterian College of Education offers General programme, Science and Mathematics and Technical Programme. The College was the first to start the training of visually impaired students in 1945. Currently the College also trains hearing impaired students. Presbyterian College of Education is the only College in the country that trains both visually impaired and hearing impaired students as well as runs the three major programmes preparing pre-service teachers for the basic schools in the country. The missionaries who established the college were the first to introduce the cocoa crop into the country far before Tetteh Quarshie brought some from Fernando Po. The small cocoa farm they established still exist on the compound of the College. The Presbyterian College of Education now has a Tertiary status and is fully accredited with Accreditation certificate. The College is currently affiliated to the University of Cape Coast and the University of Education, Winneba. The College has had twenty five past Principals and has produced prominent men and women who have served and continue to serve the country in all areas of the nation's development. The current student population is over one thousand five hundred.

CHAPTER 3

METHODOLOGY

3.0 Overview

This chapter provides a detailed description of the methods used in the study. The research design, the target population, the research sampling techniques and sample size, location of the study, construction of research instruments, data collection techniques, logistical and ethical considerations for the study have been discussed in this chapter.

3.1 Research Methodology

Research methodology according to (Kothari, 2004) is a way to systematically solve the research problem. According to Lapan (2011), research methodology refers to the strategies that researchers use to ensure that their work can be critiqued, repeated, and adapted. These strategies guide the choices researchers make with respect to sampling, data collection, and analysis. He posits that there is and must be a close association and integration among research questions, research methodology, and methods of data collection. Kumar (2018) reveals that research methodology may be understood as a science of studying how research is done scientifically. In it, we study the various steps that are generally adopted by a researcher in studying his research problem along with the logic behind them (Kothari, 2004). The outcome of every scientific enquiry is as important as the processes, sources and principles that led to the discovery of knowledge. Lapan (2011) points out that research methodology drives the assumptions we make and our choice of topic and methods and situates us in a particular geopolitics of time and space. He further states that methodology determines whether we are looking for the truth, a point of view, a structural cause or

an individual failing, an answer, or a question. Again research methodology determines whether we will believe we own what we find or whether we believe we enter into a relationship with those ideas to learn from them, to care for them, and to pass them on to the next generation. Methodologies, driven by beliefs about the nature of truth and data, encourage us to consider not only how to engage in the process of research but also *why* and *to what end* we engage in it in the first place. McMillan and Schumcher (2014) in their book, "Research in Education Evidenced-Based Inquiry" mention quantitative, qualitative and mixed method research approaches as the three main modes of inquiry or approaches to research. Purists, stating from (Denzin & Lincoln, 2000) suggests that quantitative and qualitative research methods are based on six different assumptions. These assumptions are;

i. Assumptions about the world. He explains this by stating that while quantitative research is based on some form of positivism which assumes that there stable, social facts with a single reality, separated from the feelings and belief of individuals, qualitative research is based more on constructionism, which assumes that multiple realities are socially constructed through individual and collective perceptions or views of the same situation.

ii. Research purpose. The main purpose of the quantitative research is to establish relationships and explain causes of changes in measured outcomes. The purpose of qualitative research is more focus with understanding the social phenomena from the participants' perspectives.

iii. Research methods and process. There is an established set of procedures and steps that guide the researcher in quantitative studies. In qualitative studies, there is a greater flexibility in both the strategies and the research process.

iv. Prototypical studies. Experimental or correlational designs are usually employed by quantitative researchers to reduce error, bias, and the influence of extraneous variables. The prototypical qualitative study of ongoing events is an ethnography, which helps readers understand the multiple perspectives of the social scene or system by the persons studied. Whereas quantitative research seeks to control for bias through design, qualitative research seeks to take into account subjectivity in data analysis and interpretation.

v. Researcher role. The ideal quantitative researcher is detached from the study to avoid bias. The qualitative researcher becomes immersed in the situation and the phenomena being studied. Emphasis is placed on the importance of data collected by a skilled, prepared person in contrast to an instrument.

vi. Importance of the context in the study. Quantitative research, mostly attempts to establish universal, context-free generalizations. In qualitative research, the researcher believes that human actions are strongly influenced by the settings in which they occur. Hence the researcher cannot understand human behaviour in isolation. It must be understood in the framework within which subjects interpret their thoughts, feelings, and actions. This framework is critically noted by the qualitative researcher during data collection and analysis.

Mishra and Alok (2017) in their book, *"Handbook of Research Methodology"* provided an important distinction between research methods and research methodology. According to them, "*research methods include all the techniques and methods which have been taken for conducting research whereas research methodology is the approach in which research troubles are solved thoroughly*". The research methodology used in this study is non-experimental. For this type of study,

the researcher cannot control, manipulate or alter the predator variables but instead, relies on interpretation, observation or interactions to come to a conclusion.

3.2 The Research Design

McMillan and Schumcher (2014) describe a research design as the procedures for conducting the study which looks at when, from whom and under what conditions the data will be obtained. They further explain that the purpose of a research design is to specify a plan for generating empirical evidence that will be used to answer the research questions. Again the intent is to use a design that will result in drawing the most valid, credible conclusions from the answers to the research questions. Research design is very important because certain limitations and cautions in interpreting the research results are related to each design. The given research design selected also determines how the data should be analyzed. McMillan and Schumcher classified research design into four major categories as quantitative, qualitative, mixed method and analytic. Creswell (2012) defines research designs as the specific procedures involved in the research process: data collection, data analysis, and report writing.

3.2.1 Quantitative research designs

McMillan and Schumcher (2014) groups the quantitative research designs into two main categories; Experimental and non-experimental designs. Quantitative research designs emphasizes objectivity in measuring and describing phenomena. As a result the research designs maximize objectivity by using numbers, statistics, structure and control. Experimental designs can be a true experimental, quasi-experimental or Single-subject. In an experimental design, the researcher intervenes with a procedure that determines what the subjects will be. Non-experimental designs on the other hand describe phenomena and examine relationships between different phenomena without

any direct manipulation of conditions that are experienced. There are six types of non-experimental designs. These are: descriptive, comparative, correlational, survey, ex post facto, and secondary data analysis.This study made use of correlational research method. Correlational research is a type of non-experimental research method in which a researcher measures two variables, studies and weighs the statistical relationship between them with no influence from any extraneous variable. That is, the researcher does not control or manipulate any of the two variables. Correlational studies are concerned about the relationship between two or more variables or things but cannot tell us anything about cause and effect (Amoako, et al., 2019).

Correlational research as already indicated, measures the numerical strength between two variables and therefore lends itself to quantitative data analysis. The quantitative data is a type of research method which tries to quantify data and establish cause and effect relationship between variables with the help of statistical or mathematical methods (Rubin, & Haridakis, 2016). The quantitative research method focuses on the quantity of things and generally takes the form of number, and their analysis which involves counting or quantifying these to draw conclusions. Quantitative research emphasizes objective measurement and the statistical, mathematical, or numerical analysis of data. Using quantitative data analysis makes the conclusion generalizable due its larger sample size (Babbie 2010). Its analyses according to Benny and Blonder (2016) are considered reliable due to the statistical methods employed and it is appropriate for situations where systematic and standardized comparisons are needed. This type of study involves a statistical measure of the degree of relationship, called the correlation. The relationship measured is a statement about the degree of association between the variables of interest. A positive correlation means that high values of one variable are associated with high values of a second variable. A

negative correlation means that high values of one variable are associated with low values of a second variable.

3.2.2 When to use correlation

There are mostly two conditions that pre-empt researchers' interest to find statistical relationships between variables by choosing to conduct a correlational study rather than an experiment. Firstly, when the researcher wants to find out if there is a relationship between two variables, but do not expect to find a causal relationship. For instance, you want to know if there is any correlation between the number of children people have and which political party they vote for. You do not think having more children causes people to vote differently. It is more likely that both are influenced by other variables such as age, religion, ideology and socioeconomic status. But a strong correlation could be useful for making predictions about voting patterns (McCombes, 2019).

Also, correlational study is done when the researcher thinks there is a causal relationship between two variables, but is impractical or unethical to conduct experimental research that manipulates one of the variables. This implies that even though the researcher might think the relationship is causal, the researcher cannot manipulate the independent variable because it is impossible, impractical, or unethical. For instance, you hypothesized that, passive smoking cause asthma in children. It would be unethical to do an experiment to test this hypothesis where you will deliberately expose some children to passive smoking. But you can do a correlational study to find out if children whose parents smoke are more likely to have asthma than children whose parents do not indulge in smoking (McCombes, 2019).

3.3 Methods of Data Collection

There are basically two approaches in conducting correlational studies; naturalistic observation and archived data. Naturalistic observation is a method that involves observing subjects in their natural environment. The goal of this approach is to look at behaviour in a natural setting without intervention. During this period the researcher may take notes or tallies of various behaviours they observe. This period can also be used to consider the appropriate sample for the study. Archived data are any data that are collected prior to the beginning of the research study. Archived data generally falls under the following categories; public data sets, private data sets and private records. Public data sets are data collected by various government agencies and academic institutions that make their data available to the public for research purposes. The use of public data set does not involve human subjects and therefore does not require Institutional Review Board (IRB) review as long as the following criteria are met:

i. The research work will not involve merging any of the data sets in a way that individuals might be identified.
ii. The researcher will not enhance the public data set with identifiable , or potentially identifiable data
iii. Researcher will not use a restricted data set
iv. Researcher will use a public data set that is included on the list of institutional Review Board – Health Services Research (IRB-HSR) approved list of public data set
v. Researcher will not use data from the NIH GWAS (National Institutional of Health Genome-Wide Association Studies) data repository

vi. The data set does not have any additional requirements other than a Data Use Agreement.

Private data sets may include (but not limited to):

i. Data collected previously by another researcher for another study,
ii. Data collected by another agency for evaluative or research purposes,
iii. The researcher's own data that was collected for a previous study.

Private data sets generally require permission to access the data, and the IRB-HSR will need to know that the researcher will obtain proper permission to access the data. Private records are data that were not collected with the intent to conduct research, but instead exists for the purpose of collecting information on individual's own sake. Example of such are student records, medical records, credit histories are private records that are maintained by agencies other than the individual but contain personal information about the individual.

This research adopted the use of archived data otherwise known as secondary data or documented data. Archived data is a data which has been collected already for some other purposes. The data used for the study was obtained from the aggregates WASSCE scores that students used to seek for admission into the Akropong College of Education for the diploma in basic education programme and their final GPA values that they exited with which was awarded by the University of Cape Coast. Permission letters were written to the administration of the Presbyterian College of Education, and the Institute of Education, University of Cape Coast for the request to use the data. The Presbyterian College of Education administration provided me with files of students who were admitted into the college for the years, 2013, 2014, 2015 and 2016. Students' entry grades for admission were picked from their files and

recorded for the study. The Institute of Education, University of Cape Coast gave the researcher the results of graduates who were awarded the diploma in basic education certificate for the 2016, 2017, 2018 and 2019 graduating years. The data included gender, programme of study, cumulative grade point averages and class awarded.

3.3.1 Interpretation of the correlation co-efficient

The correlation coefficient is the statistical measure of the strength of the relationship between two variables. The values range from -1.0 to 1.0. When the correlation coefficient is close to +1, there is a positive correlation between the two variables. If the value is close to -1, there is a negative correlation between the two variables. When the value is close to zero, then there is no correlation between the two variables (Arthur, 2019).

A positive correlation indicates a positive relationship between two variables. That is when an increase in one variable leads to a rise in the other variable. A decrease in one variable will see a reduction in the other variable. For example, the amount of money a person has might positively correlate with the number of cars the person owns.

A negative correlation is quite literally the opposite of a positive relationship. If there is an increase in one variable, the second variable will show a decrease and vice versa. For example, being educated might negatively correlate with the crime rate when an increase in one variable leads to a decrease in another and vice versa. If the level of education in a country is improved, it can lower crime rates.

A no correlation between two variables indicates that there is no relationship between the two variables. This means that a change in one variable may not necessarily see a

difference in the other variable. For example, being a millionaire and happiness is not correlated. An increase in money may not lead to happiness.

Size of Correlation coefficients is critical in correlational studies. Correlations such as 0.87, 0.95, and -0.88 are high; 0.42, -0.36, and 0.58 are moderate; and 0.07, -0.01, and 0.12 are small, but these words only provide a hint at the magnitude of the relationship (Arthur, 2019). The coefficient is a mathematical way of expressing the degree to which there is covariance between the variables, not an indication of the degree to which the variables share common properties or characteristics. To determine the proportion of the variance that the two measures share or have in common, the coefficient of determination, which is the square of the correlation coefficient expressed in percentages is used. A correlation of 0.40 indicates that the variables have 16% (coefficient of determination) of their variance in common and that the remaining 84% is left unexplained or unpredicted by the 0.40 correlation. Another consideration with respect to the size of correlation is that many correlations are termed significant even though they may be quite low, for example 0.15 or 0.18. The term significant in the context of correlations indicate that the coefficient is statistically different from zero (meaning no relationship for correlation coefficient of zero) at a specified level of significance. If a study has a very large number of subjects, more than one thousand (1,000), then small correlations can be significant but only in a statistical sense. For research in which prediction is the primary goal, the low correlations, even though statistically significant, are of little practical significance. Generally, in studies investigating relationships only, correlations as low as 0.30 are useful, but in prediction studies or estimates of reliability and validity, higher correlations are needed. The usefulness of correlations varies, depending on whether the research work is focusing on groups or individuals. In general a much

larger correlation is needed for use with individuals than groups.The Pearson correlation or Spearman correlation is used when a researcher wants to explore the strength of the relationship between two continuous variables. This gives an indication of both the direction (positive or negative) and the strength of the relationship. A positive correlation indicates that as one variable increases, so does the other. A negative correlation indicates that as one variable increases, the other decreases.

3.3.2 Characteristics of correlational research

Correlational study is non-experimental: It means that researchers need not manipulate variables with a scientific methodology to either agree or disagree with a hypothesis. The researcher only measures and observes the relationship between the variables, without altering them or subjecting them to external conditioning.

Correlational research is backward looking: It only looks back at historical data and observes events in the past. Researchers use it to measure and spot historical patterns between two variables. A correlational study may show a positive relationship between two variables, but this can change in the future.

Correlational research is dynamic: The patterns between two variables from correlational research are never constant and are always changing. Two variables having a negative correlation in the past can have a positive correlation relationship in the future due to various factors. Correlational designs can be subdivided into the following studies.

i. Bivariate Correlational studies. In this study researchers obtain scores from two variables for each subject and then use the pairs of scores to calculate a correlation coefficient. The variables are selected because theory, research, or

experiment suggests that they may be related. The instrument selected for must be reliable and provide a range of responses. Instruments such as tests, questionnaire, interviews, and observations may be employed.

ii. Prediction studies. There are many situations in education in which there is the need to make predictions. In prediction studies outcomes are related to behaviours that occurred prior to the criterion. When researchers make predictions based on two variables, the statistical procedure that they use is called bivariate regression.

iii. Multiple correlational studies. This is a situation where several predicted variables are used to make a prediction. The statistical procedure is called multiple regression. A multiple regression can also be a Logistic regression. This is a situation in which the dependent variable is dichotomous.

iv. Spurious correlations. When a correlation over represents or underrepresents the actual relationship, it is called a spurious correlation. Spurious correlations that overestimate relationships are obtained if there is a common variable that is part of both the independent and the dependent variables.

3.3.3 Assumptions underpinning the use of the correlational research design

Pullant (2016) states a number of assumptions underpinning the technique of correlational research. He indicates the usefulness of these assumptions to the relevant of the research design and the results from the analysis.

i. Level of measurement

The scale of measurement for the variables should be interval or ratio (continuous). One exception to this is if you have one dichotomous independent variable (with only two values e.g. sex) and one continuous dependent variable.

ii. Related pairs

Each subject must provide a score on both variable X and variable Y (related pairs). Both pieces of information must be from the same subject.

iii. Independence of observations

The observations that make up the data must be independent of one another. That is, each observation or measurement must not be influenced by any other observation or measurement. Any situation where the observations or measurements are collected in a group setting, or participants are involved in some form of interaction with one another, should be considered suspect.

iv. Normality

Ideally, scores on each variable should be normally distributed. This can be checked by inspecting the histograms of scores on each variable.

v. Linearity

The relationship between the two variables should be linear. This means that when the scatterplot of scores are observed one should see a straight line (roughly), not a curve.

vi. Homoscedasticity

The variability in scores for variable X should be similar at all values of variable Y. Checking this from the scatterplot, a fairly even cigar shape along its length must be observed.

vii. Missing data

When conducting a research, particularly with human beings, it is very rare that a complete data from every case will be obtained. It is thus important that data is critically inspected for any missing data from the file data. A descriptive is run on a

given statistical package to find out what percentage of values is missing for each of variables under study. The missing values should be checked if they are happening randomly or whether there is some systematic pattern.

3.4 Target Population

Target population is the aggregate cases about which the researcher would like to make generalisations and it is the unit from which a sample is required and actually studied (Amedehe, 2002). According to Amedehe (2002), researchers normally sample from the accessible population and hope to make generalisation to the target population. The Presbyterian College of Education admits students each year to study different course for the diploma in basic education certificates. The target population for this study was all students who applied to the college and were given admission and studied, wrote and pass all the required examination conducted by the Institute of Education, University of Cape Coast and were issued with the Diploma in Basic Education certificate at the end of their studies.

3.5. Sample Size and Sampling Techniques

Sampling as a technique is a way to use small number of units of a whole population to make generalisation about the population. Crossman and Hardesty (2018) observed that using the sample instead of the population helps to reduce cost and save time. One of the methods employed in selecting a representative sample is Purposive sampling. Etikan, Musa and Alkassim (2016) described Purposive sampling as a form of non-random sample method whereby the researchers use their own judgement in choosing participants for the study. The researcher used purposive sampling because the research was about a category of students. That is the students of Presbyterian College of Education, Akropong who were admitted in 2013, 2014, 2015 and 2016

and completed all the required courses, wrote examination and graduated in 2016, 2017, 2018 and 2019 respectively with the Diploma in Basic Education certificate awarded by the University of Cape Coast.

3.5.1 Sample size

The sample size was 2,097 and this comprised all the past student of Presbyterian College of Education, Akropong who graduated with the Diploma in Basic Education from 2016 to 2019.

3.6 Research Instrument for Data Collection and Ethical Consideration

Data collection instruments are tools used by researchers to collect data in the research process. In quantitative research, data collection techniques that can be employed, according to McMillan & Schumacher (2014), are Interviews, Observations, Alternative Assessment, Questionnaires, Noncognitive measures and the Paper-and-Pencil Tests. The standardized test is an example of the paper-and-pencil tests instrument for data collection. McMillan & Schumacher (2014) explained that standardized test provides uniform procedures for test administration and scoring.

The research instruments for this study were the standardized tests scores of the West Africa Secondary School Certificate Examination for Pre service teachers who were admitted into the Presbyterian College of Education from 2013 to 2016 academic years and the graduating GPAs awarded by the Institute of Education, University of Cape Coast for graduates from the Presbyterian college of Education from 2016 to 2019. These instruments were used because they have high validity and reliability. Validity refers to the degree to which evidence and theory support the interpretation of test scores entailed by the specific uses of test (Standard, 2000, p.9). These data were sourced from the academic unit of the Presbyterian College of Education with a

written permission to the Principal for the use of the data for the research. The anonymity of the data collected was assured and ensured by the researcher. Standard test scores from the West Africa Examination Council are carefully and commercially prepared by measurement experts who pay attention to reliability and validity.

Standard test scores from the WEAC are used by national and international post-secondary educational institutions for admitting students. Again standardized test is an instrument with established validity, reliability, direction and scoring procedures.

The University of Cape Coast is a prestigious and recognized higher educational institutions, which is among the Universities in Ghana that mentors and supervises the Colleges of Education in training teachers for the basic schools in the country. Tests scores for graduates are of high quality and lacks bias. Organisations and institutions have over the years and continue to rely on the GPAs on certificates issued by the University of Cape Coast for promotions, job placements and admissions for higher studies, nationally and internationally.

McMillan and Schumacher (2014) explained that standardized test, as an instrument for collecting data, is a carefully constructed instrument which establishes validity, reliability, directions and scoring procedures and possesses characteristics such as low relevance and sensitivity, high technical quality such as relativity and lack of test bias, test items constructed are of a high quality, has specific set of instructions relating to the procedures to administer and score, scoring interpretations, most of the times depend on national norm, content tested in standardized test are general and not specific, and test have a high ability to provide variability. Calucg, *et al*, (2016), Shiyue, HE. *et al,* (2015), Stemler S. E. (2012), Wright V.J. (2015) and Davidovitch & Soen (2015) all used standardized test scores and grades of students in similar

predictive and correlational studies. Selim & Alzarooni (2009) used students' high school GPA to predict their performance in an engineering study program. Austin (1993) argues that high school grades provides institutions' admission office one good indicator of students' academic ability. The selected research instrument therefore will provided the best data for this work.

Labels were used to represent pre-service teachers whose information was used for the study. A_i and Z_i indicated the standardized scores for admissions score and graduation CGPA respectively for the candidates. This ethical consideration was adopted to protect the identity of pre-service teachers whose standardized scores and GPAs were used in the study. Again the data was stored securely so that no other person could have access to the raw data collected from the College administration and the Institute of Education, University of cape Coast.

3.7 Validity and Reliability of the Instrument

Validity and reliability of an instruments are key in using the standardized test as an instrument for data collection. Reliability refers to the dependability or consistency of the scores of students. Content validity however refers to a test's ability to effectively evaluate what it is supposed to measure. The West Africa Examination Council (WAEC) is an internationally recognised examination body that develops test items and conduct examinations for pre-tertiary schools in Ghana and other West Africa countries. The test items are constructed by measurement experts who place much attention to the nature of the norms, reliability and validity. Results issued by WAEC are internationally accepted for admissions into post-secondary education, locally and internationally and for a variety of settings. The WASSCE results issued to candidates for admission into the Colleges of Education are therefore reliable, adequate and valid

for the conduct of this research. The Institute of Education, University of Cape Coast, oversees the conduct of examinations for the Colleges of Education in Ghana for the award of the diploma in basic education. The tests are developed and conducted by measurement experts who place premium on validity, objectivity and reliability. The University of Cape Coast is a reputable educational institution with a track record. The process for conducting examinations have been tested to be resilient and scores from the examinations gone through professional test administration. Results and certificates issued by the University of Cape Coast are recognized and accepted by all universities, locally and internationally, for individuals who wish to use it for further studies. Industries and organizations depend largely on the results and certificate awarded by the University of Cape Coast to prospective job seekers for recruitment. The CGPA of graduating diploma in basic education from the University of Cape Coast are valid and reliable for the conduct of this research work. Due process and due diligence guided the process for securing the data for the studies. No result was altered and the identity of the students involved was to greater extent remained anonymous.

3.8 Data Collection Procedure

The study used secondary data that was obtained from the Institute of Education, University of Cape Coast and the admission office of the Presbyterian College of Education, Akropong. An application letter through, the Principal of Akropong Presbyterian College of Education, was sent to the Institute of Education, University of Cape Coast. The letter sought permission to collect data of entry grades (WASSCE) from Akropong Presbyterian College of Education for students admitted in 2013, 2014, 2015, and 2016 and the records of the Cumulative Grade Point Average (CGPA) of the students who graduated and were awarded the diploma in

basic education certificate from the Institute of Education, UCC for 2016, 2017, 2018 and 2019. The study population consisted of students who read General, Science, and Technical programs at the Akropong Presbyterian College of Education. A total of 2,097 students from sets "2013-2016", "2014-2017", "2015-2018", and "2016-2019" were used for the study with no gender biased. Students who were admitted with either a single sitting or more than one sitting and coming from either a public or private secondary school were all included. The documentary data received from the Institute of Education, University of Cape coast came with the following heading: Students' index number, Gender, Programme of study and the Cumulative Grade Point Average. Additional column was created by the researcher and the WASSCE total score for the best six subject for admission entered for each graduate in an Excel format.

3.9 Data Analysis

In the analysis of the data collected, each student's WASSCE and CGPA results were coded with numerical value and keyed into the data view of the Statistical Package for the Social Sciences (SPSS version 22.0) computer software. A Pearson Product Moment Correlation Coefficient (r) was computed to ascertain the relationship between students' performance at West African Senior School Certificate Examination (WASSCE) and their Cumulative Grade Point Average (CGPA) Results at College of Education. The independent–samples t-test was performed to determine if there was any significant difference between the CGPA of the males and the females. The mean entry grades and the mean graduating CGPA for the data sets were computed for each year of entry and the year of graduation. The output results were discussed and used to address the research questions posed in the study.

CHAPTER 4

RESULTS AND DISCUSSION

4.0 Overview

This chapter is devoted to the presentation and discussion of the results generated by the SPSS (version 22.0) software. The relationship between WASSCE results and CPGA was investigated using the Pearson product-moment correlation. Preliminary analysis were performed to ensure no violation of the assumptions of normality, linearity and homoscedasticity. Demographic characteristics of the students; particularly gender, their performance at WASSCE and CGPA results at College of Education are also discussed. The independent samples t-test was performed on the various dataset to ascertain if the academic performance of the males were significantly different from the females.

4.1 Explanation of Data

WASSCE and SSSCE results are graded using labels and values whereas CGPA are graded using values. A WASSCE grade of "A", which indicates the highest performance, has a value of "1". A WASSCE grade of 'F' or 'F9' indicates the worst performance and has a value of '9'. For the CGPA, a larger value indicates a better performance and a smaller value shows a weaker performance. A WASSCE candidate who scores A in all the six required subjects for admission will have a WASSCE score 6 while the candidates who scores B2 in all the six required subjects for admission gets a WASSCE score of '12'. The highest value for an excellent graduating grade is 4.0 and for the WASSCE, the highest performance value indicator is 1. Therefore a smaller total value of WASSCE/SSSCE indicates a better performance while a smaller value of CGPA indicates a worse performance. This

means a positive correlation indicates a higher performance at WASSCE leads to a lower CGPA for the diploma in basic education and a negative correlation means the lower the value of WASSCE total results, the higher the CGPA value .

Ratio of male and female students who graduated in 2016 but were admitted in 2013 at the Presbyterian College of Education

4.1.1 Set 1: 2013 – 2016 - Gender of students

595 students were admitted in 2013 and 565 graduated in 2016. Table 4.1 shows 359 (63.5 %) males and 206 (36.5 %) were females graduated for 2016

Table 4.1: Total Number of Male and Female Students Admitted in 2013 and graduated in 2016

	Number	Percentage (%)
Male	359	63.5
Female	206	36.5

Source: Akropong Presbyterian College of Education, Akropong.

The mean and standard deviation for the 2013 WASSCE admission scores and the CGPA of 2016 graduating students at the Presbyterian College of Education.

Table 4.2: Mean and standard deviation of WASSCE and CGPA

	Mean	St. Deviation	N
CGPA	2.714	0.4137	565
WASSCE	20.726	5.4744	565

From Table 4.2 the mean WASSCE entry score for admission into Presbyterian College of Education in the year 2013 was 21.726 with the corresponding mean graduating CGPA of 2.714 in 2016.

In order to test the assumptions underlying the use of the correlational research, leading to the calculation of the correlation coefficient, a histogram was plotted separately for the two variables, total WASSCE/SSSCE and CGPA to give an idea of the normality of the variables, the total aggregate entry grades for admission to college and the cumulative grade point average of graduating candidates for the diploma in basic education for the 2014 admitted candidate and the corresponding graduating in 2017.

The normal distribution curve for the 2013 candidates WASSCE admission score at the Presbyterian College of Education.

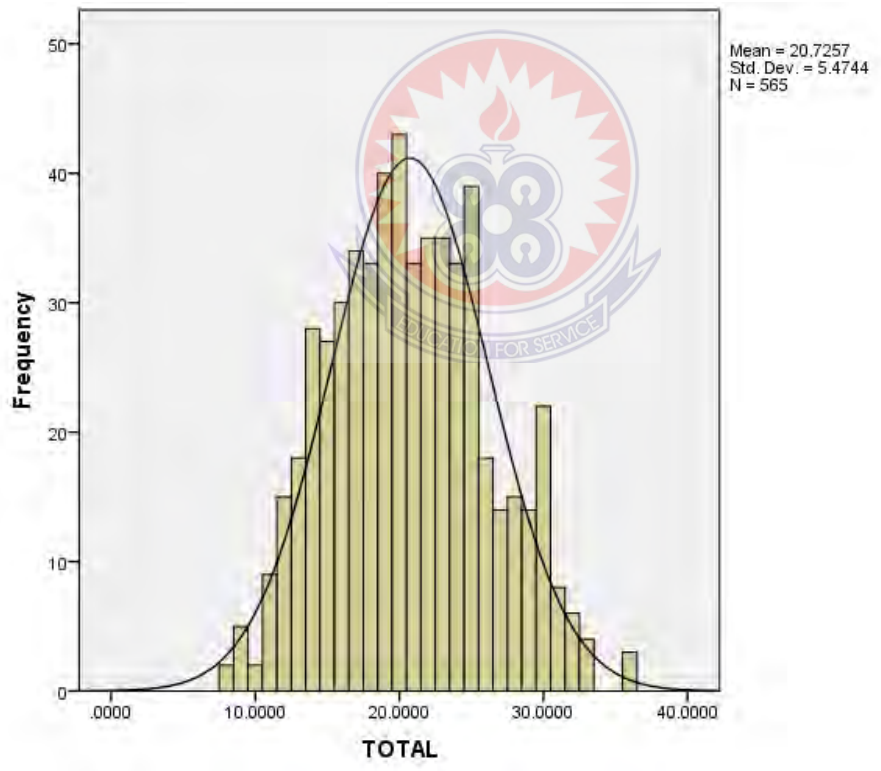

Figure 4.1: Histogram (normal curve) for Total aggregate for 2013-2016 dataset

The histogram (normal) for the WASSCE/SSSCE shows that admission entry grades are normally distributed about a mean WASSCE/SSSCE value of 20.7257 and a

standard deviation of 5.4744. The nature of the graph therefore satisfies the normality assumption. The normality assumption is one of the assumptions about normality underpinning the use of the correlational design.

The normal distribution curve for the 2016 graduating students CGPA at the Presbyterian College of Education for the diploma in basic education.

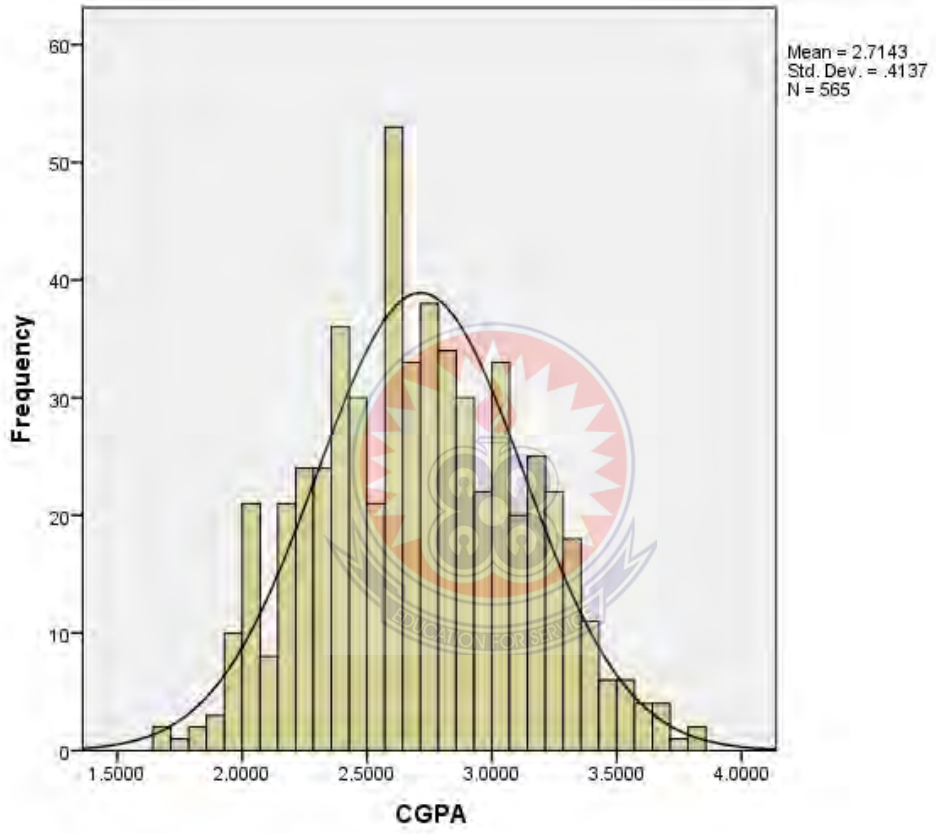

Figure 4.2: Histogram (normal curve) for CGPA for 2013-2016 dataset

Figure 4.2 shows the histogram (normal) for the cumulated grade point average CGPA for graduates of the diploma in basic education for the year 2016. These were candidates who were admitted in the year 2013 with the WASSCE/SSSCE results. The graph indicates that the variable is normally distributed and therefore satisfies one of the key assumptions underpinning the use of the correlational design. The variable

is normally distributed about the mean value of 2.7143 and a standard deviation of 0.4137.

The scatter plot of the 2013 candidates' admission WASSCE scores and the 2016 graduating students CGPA at the Presbyterian College of Education. The CGPA are found on the vertical axis while the WASSCE scores are on the Horizontal axis

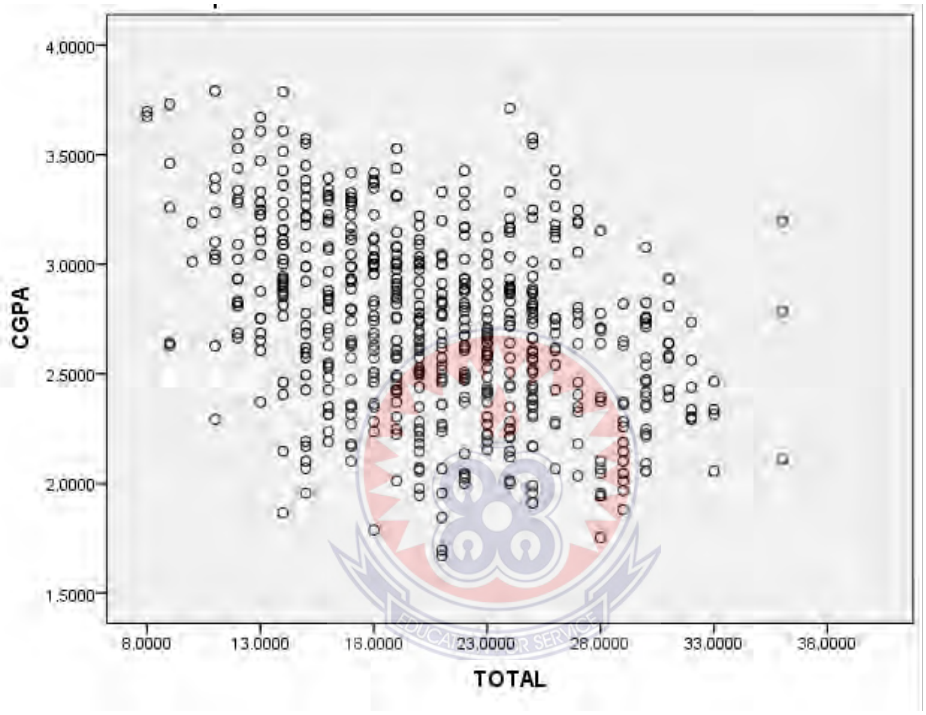

Figure 4.3: Scatter plot for 2013 – 2016 dataset between total and CGPA

In order to calculate the Pearson correlation coefficient between the WASSCE/SSSCE entry grades and the graduating cumulative grade points, a scatter plot was drawn to test the assumptions of linearity and homoscedasticity. Fig. 4.3 shows that there is an evidence of linearity for the total aggregate score (WASSCE/SSSCE) and the cumulative grade point average (CGPA). The scatter plot for the data set showed that there is a negative correlation between the two variables. There are no extraneous values and the homoscedasticity assumption is also satisfied.

Pearson Correlation coefficient between the 2013 candidates WASSCE admission score and the 2016 graduating students CGPA values at the Presbyterian College of Education.

Table 4.3: Correlation between Performance at WASSCE and CGPA results at College of Education for students admitted in 2013 and graduated in 2016.

		CGPA	WASSCE
CGPA	Pearson Correlation	1	-0.397**
	Sig. (2-tailed)		0.000
	N	565	565

***Correlation is significance at the 0.01 level (2-tailed) Note: N = 565, p < 0.05

The Pearson Product Correlation between the students' performance at WASSCE and their CGPA results was found to be.-0.397 which implies that there is a medium relationship between their WASSCE performance and CGPA results. r (565) = -0.397, p = 0.000 P <.05 infers that there is a significant relationship between the two variables. This indicates that for an increase in students' performance at WASSCE there is an increase in their CGPA results at College of Education and vice versa. The two variables are related. The effect size is medium since the value of r = -0.397 falls between the absolute value of 0.30 – 0.49.

Percentages of male and female students who graduated in 2017 but were admitted in 2014 at the Presbyterian College of Education.

4.1.2 Set 2: 2014 – 2017 – Gender of students

547 students were admitted in 2014 and 508 graduated in 2017. 312 (61.4 %) were males representing majority and 196 (38.6 %) were females for the graduating students.

Table 4.4: Total Number of Male and Female Students Admitted in 2014.

	Number	Percentage (%)
Male	312	61.4
Female	196	38.6

Source: Akropong Presbyterian College of Education, Akropong.

The mean and standard deviation for the 2014 WASSCE admission scores and the CGPA of 2017 graduating students at the Presbyterian College of Education.

Table 4.5: Mean and standard deviation of WASSCE and CGPA

	Mean	St. Deviation	N
CGPA	2.717	0.482	508
WASSCE	22.34	4.805	508

From Table 4.5 the mean WASSCE entry score for admission into Presbyterian College of Education in the year 2014 was 22.34 while the corresponding mean graduating CGPA was 2.714 in 2017.

A histogram was plotted to give an idea of the normality of the two variables, the total aggregate (WASSCE/SSSCE) entry grades for admission to college and the cumulative grade point average (CGPA) of graduating candidates for the diploma in basic education for the 2014 admitted candidate and the corresponding graduating students in 2017 as shown in Figs 4.4 and 4.5

The normal distribution curve for the 2014 candidates WASSCE admission score at the Presbyterian College of Education

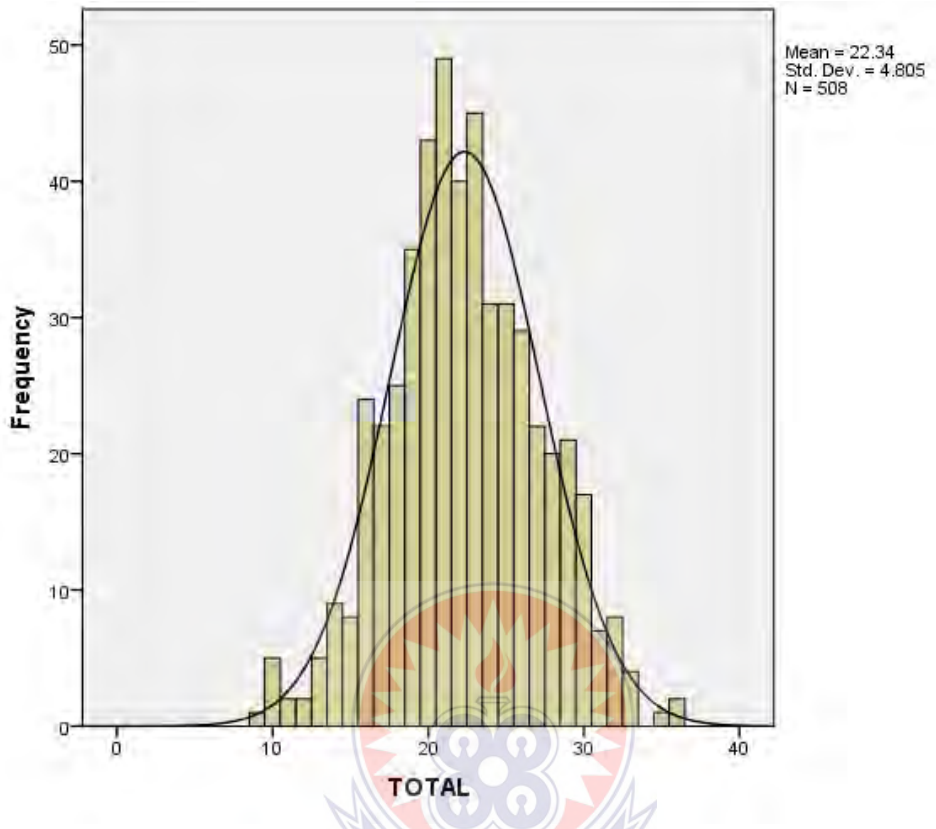

Figure 4.4: Histogram (normal curve) for Total aggregate for 2014-2017 dataset

The histogram shows that the total WASSCE/SSSCE entry grades for admission into the Presbyterian College of Education in 2014 was normally distributed variable. The total WASSSCE/SSSCE entry score is normally distributed with a mean entry total of 22.34 and a standard deviation of 4.805. This normality of the variable, therefore satisfies one of the assumptions underpinning the use of the correlational design.

The normal distribution curve for the 2017 graduating students' CGPA at the Presbyterian College of Education for the diploma in basic education.

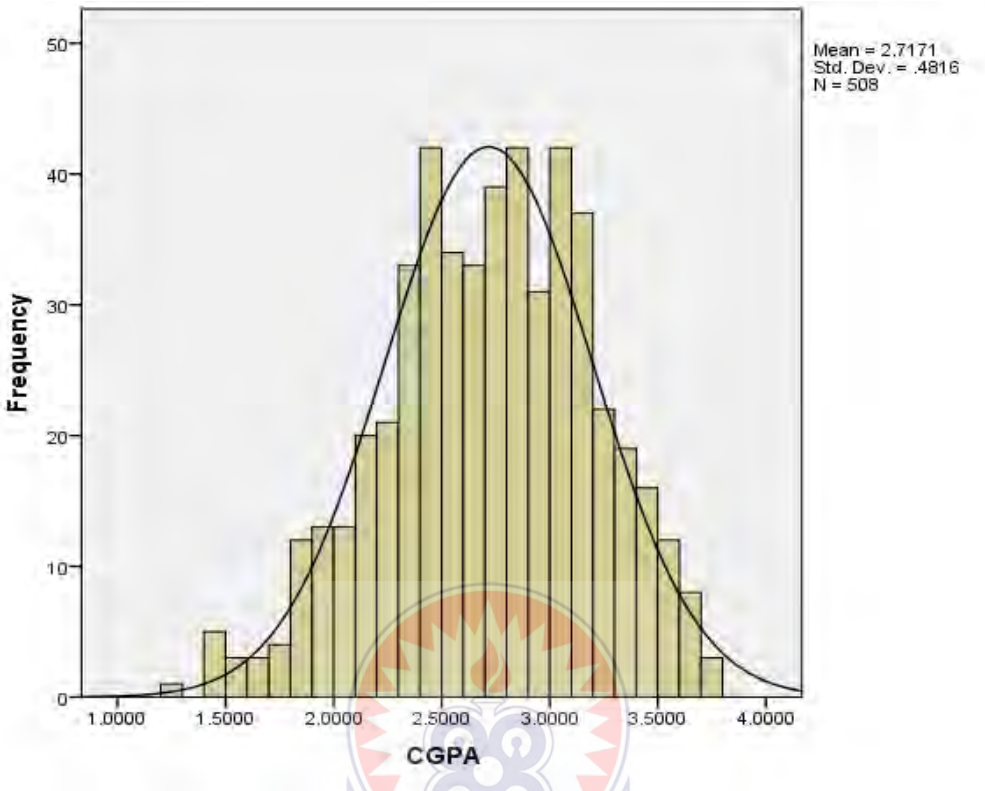

Figure 4.5: Histogram (normal curve) for CGPA for 2014-2017 dataset

The normality assumption was tested for the cumulative grade point average (CGPA) for the students who graduated in the year 2017. The above histogram shows that the CGPA for the 2017 graduating candidates are normally distributed with a mean CGPA of 2.7171 and a standard deviation of 0.4816. The normality of the CGPA satisfies a major assumption that guides the use of the correlational design, and therefore the calculation of the correlation coefficient.

Again the assumptions about linearity and homoscedasticity of the total aggregate WASSCE/SSSCE score and the cumulative grade point average were tested by plotting the scatter plot between the total aggregate and the CGPA as in Fig 4.6 The scatter plot for the data set showed that there is a negative correlation between the two

variables. There are no extraneous values and the homoscedasticity assumption is also satisfied.

The scatter plot between the 2014 candidates' admission WASSCE scores and the 2017 graduating students CGPA at the Presbyterian College of Education. The vertical axis represents the CGPA while the WASSCE scores are shown on the Horizontal axis.

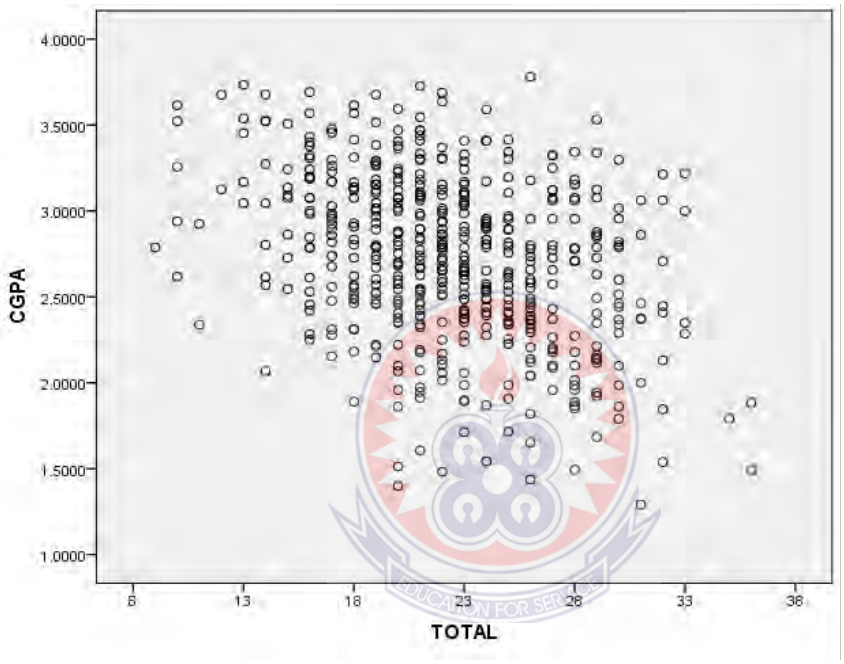

Figure 4.6: Scatter plot for 2014-2017 data set between Total aggregate and CPGA

The Pearson correlation coefficient was computed to ascertain the kind of relationship between the total aggregate and the CGPA and the result is presented in the table below.

Pearson Correlation coefficient between the 2014 candidates WASSCE admission score and the 2017 graduating students CGPA values at the Presbyterian College of Education

Table 4.6: Correlation between Performance at WASSCE and CGPA results at College of Education for students admitted in 2014 and graduated in 2017.

		CGPA	WASSCE
CGPA	Pearson Correlation	1	-0.363**
	Sig. (2-tailed)		0.000
	N	508	508

***Correlation is significance at the 0.01 level (2-tailed) Note: N = 508, p < 0.05

From Table 4.6, the Pearson Product Correlation between the students' performance at WASSCE and their CGPA results was found to be.-0.363 which implies that there is a medium relationship between their WASSCE performance and CGPA results, r (508) = -0.363, p = 0.000 P <.05 which also shows that there is a significant relationship between the two variables. This shows that for an increase in students' performance at WASSCE there is an increase in their CGPA results at College of Education. These two variables therefore relates. The effect size of this model is medium because the correlation coefficient r=-0.363 is between the absolute value of 0.3 – 0.49.

Percentages of male and female students who admitted in 2015 and graduated in 2018 at the Presbyterian College of Education.

4.1.3 Set 3: 2015 – 2018 – Gender of students

475 students were admitted and 477 graduated. The graduated number were more than those admitted because two students who could not complete their study the previous year joined the 2018 graduation year. 298 (62.5 %) of the graduates were males, representing majority, and 179 (37.5 %) were females.

Table 4.7: Total Number of Male and Female Students Admitted in 2015.

	Number	**Percentage (%)**
Male	298	62.5
Female	179	37.5

Source: Akropong Presbyterian College of Education, Akropong.

The mean and standard deviation for the 2015 WASSCE admission scores and the CGPA of 2018 graduating students at the Presbyterian College of Education.

Table 4.8: Mean and standard deviation of WASSCE and CGPA for 2015-2018 set

	Mean	**St. Deviation**	**N**
CGPA	2.763	0.541	477
WASSCE	23.45	5.210	477

From Table 4.8 the mean WASSCE entry score for admission into Presbyterian College of Education in the year 2015 was 23.45 with the corresponding mean graduating CGPA of 2.763 in 2018.

The normal distribution curve for the 2015 candidates WASSCE admission score at the Presbyterian College of Education

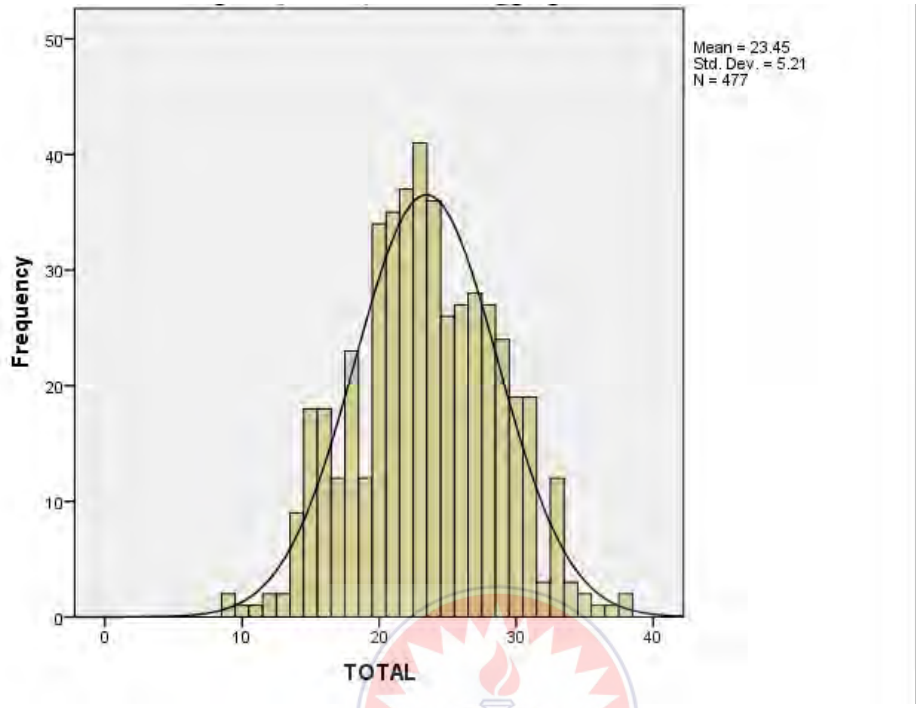

Figure 4.7: Histogram (Normal) for Total Aggregate for 2015 - 2018

Figure 4.7 shows that the total WASSCE/SSSCE entry grades for admission into the Presbyterian College of Education in 2015 was a normally distributed variable. The total WASSSCE/SSSCE entry score is normally distributed with a mean entry total of 23.45 and a standard deviation of 5.21. This normality of the variable, therefore satisfies one of the assumptions underpinning the use of the correlational design.

The normal distribution curve for the 2018 graduates CGPA graduating values at the Presbyterian College of Education

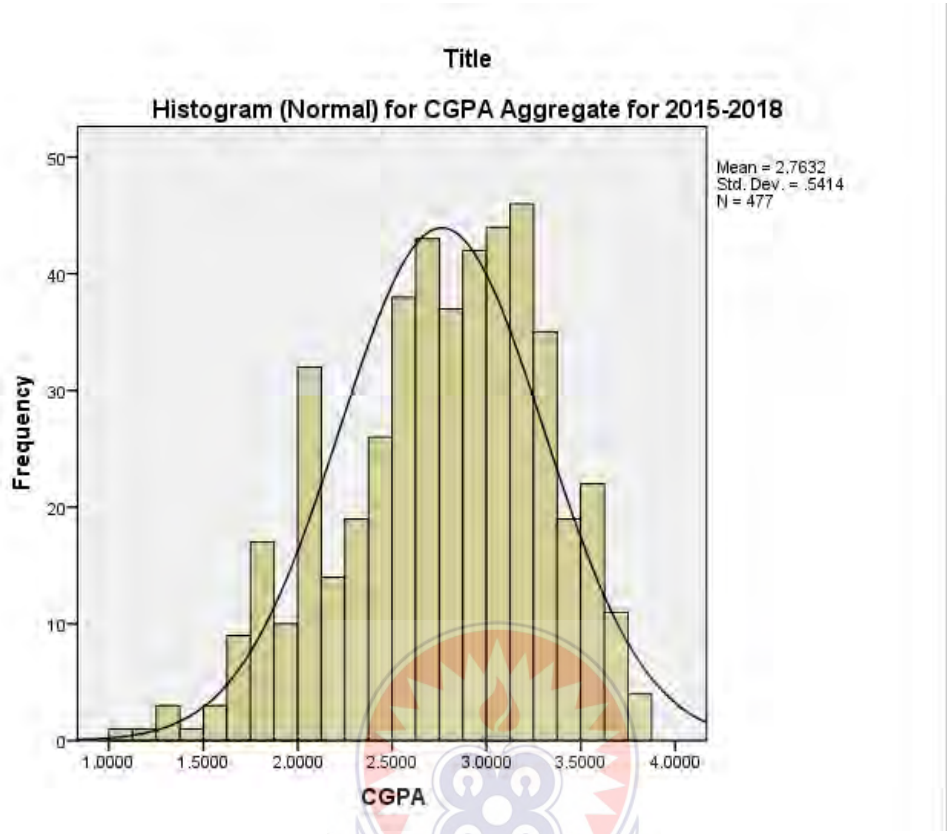

Figure 4.8: Histogram (Normal) for CGPA Aggregate for 2015 - 2018

The normality assumption was tested for the cumulative grade point average (CGPA) for the students who graduated in the year 2018. The above histogram shows that the CGPA for the 2017 graduating candidates is a normally distributed variable with a mean CGPA of 2.7632 and a standard deviation of 0.5414. The normality of the CGPA as a variable satisfies a major assumption that guides the use of the correlational design, and therefore the calculation of the correlation coefficient.

Linearity and homoscedasticity are two other assumptions necessary for testing for the correlational design. The assumptions about linearity and homoscedasticity of the total aggregate WASSCE/SSSCE score and the cumulative grade point average were tested by plotting the scatter plot between the total aggregate and the CGPA for the

2015 and 2018 admission entry grades and the 2018 graduating CGPA respectively. The scatter plot for the data set showed that there is a negative correlation between the two variables. There is an indication of a straight line that can be used to fit the data. There are no extraneous values and the homoscedasticity assumption is also satisfied.

The scatter plot between the 2015 candidates' admission WASSCE scores and the 2018 graduating students CGPA at the Presbyterian College of Education. The vertical axis represents the CGPA while the WASSCE scores are shown on the horizontal axis

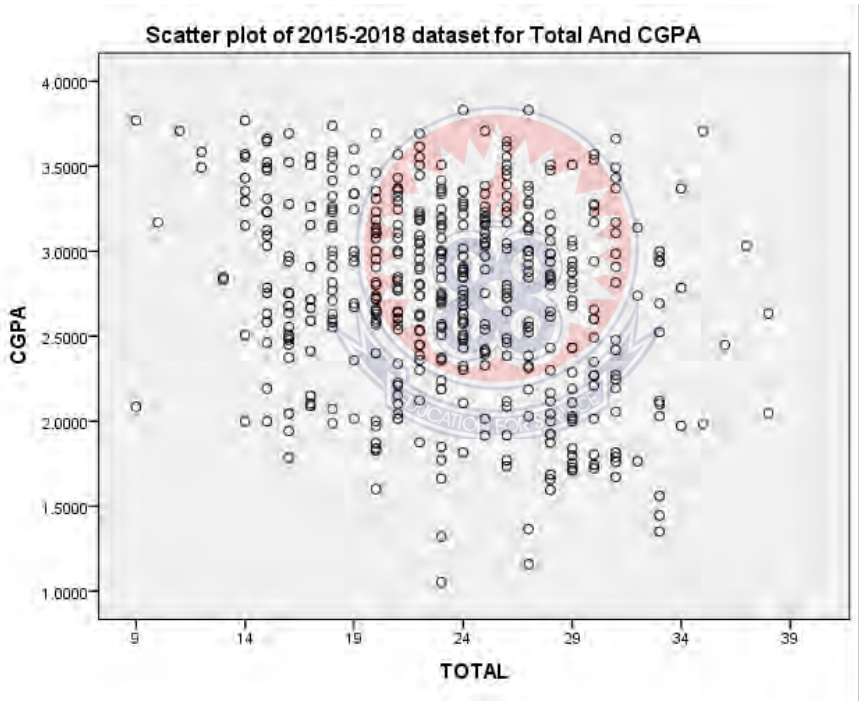

***Figure 4.9*: Scatter plot of 2015 – 2018 dataset for total and CGPA**

In order to determine the kind of relationship between the CGPA of 2018 graduating students' and their corresponding entry WASSCE/SSSCE grades the Pearson correlation coefficient was computed and the result is presented in the table below;

Pearson Correlation coefficient between the 2015 candidates WASSCE admission score and the 2018 graduating students' CGPA values at the Presbyterian College of Education

Table 4.9: Correlation between Performance at WASSCE and CGPA results at College of Education for students admitted in 2015 and graduated in 2018

		CGPA	WASSCE
CGPA	Pearson Correlation	1	-0.232***
	Sig. (2-tailed)		0.000
	N	477	477

***Correlation is significance at the 0.01 level (2-tailed) Note: N = 477, p < 0.05

From Table 4.9, the Pearson Product Correlation between the students' performance at WASSCE and their CGPA results was found to be.-0.232 which implies that there is a small relationship between their WASSCE performance and CGPA results, r (508) = -0.232, p = 0.000 P <.05 which also shows that there is a significant relationship between the two variables. This shows that for an increase in students' performance at WASSCE, there is a corresponding increase in their CGPA results at College of Education at the end of the Diploma in Education programme. There is therefore a relationship between the WASSCE results and the CGPA at the Presbyterian College of Education. The effect size of this is small due to the fact that the correlation coefficient r=-0.232 is between the range of 0.1 – 0.29.

Ratio of male and female students who graduated in 2019 but were admitted in 2016 at the Presbyterian College of Education

4.1.4 Set 4: 2016 – 2019 - Gender of students

582 students were admitted and 547 graduated. 290 (53.0 %) of the graduates were males while 257 (47.0 %) were females.

Table 4.10: Total Number of Male and Female Students Admitted in 2016.

	Number	**Percentage (%)**
Male	290	53.0
Female	257	47.0

Source: Akropong Presbyterian College of Education, Akropong

The mean and standard deviation for the 2016 WASSCE admission scores and the CGPA of 2019 graduating students at the Presbyterian College of Education.

Table 4.11: Mean and standard deviation of WASSCE and CGPA for 2016-2019

	Mean	**St. Deviation**	**N**
CGPA	2.797	0.487	547
WASSCE	23.90	5.756	547

From Table 4.11 the mean WASSCE entry score for admission into Presbyterian College of Education in the year 2016 was 23.90 with the corresponding mean graduating CGPA of 2.797 in 2019.

The normal distribution curve for the 2016 candidates' WASSCE admission score at the Presbyterian College of Education

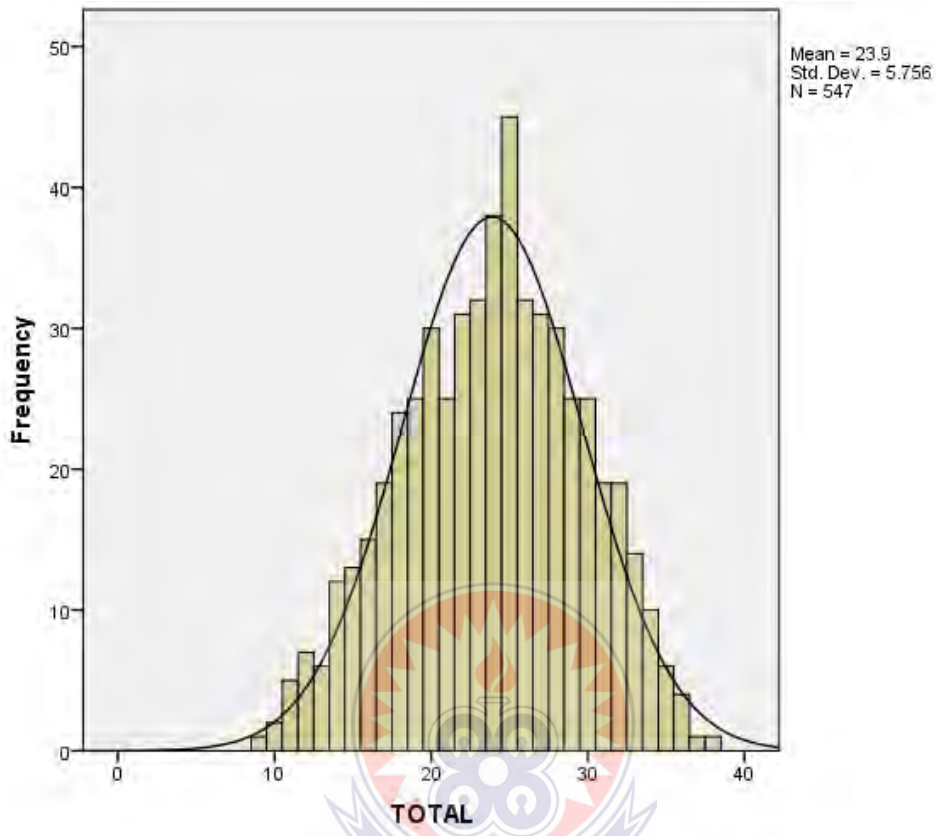

Figure 4.10: Histogram (normal curve) for Total aggregate for 2016-2019 dataset

Figure 4.10 shows that the total WASSCE/SSSCE entry grades for admission into the Presbyterian College of Education in 2016 was a normally distributed variable. The total WASSSCE/SSSCE entry score is normally distributed with a mean entry total of 23.90 and a standard deviation of 5.56. This normality of the variable satisfies one of the assumptions that guides the use of the correlational design.

The normality assumption was also tested for the cumulative grade point average (CGPA) for the students who graduated in the year 2019. The histogram below shows that the CGPA for the 2019 graduating candidates is a normally distributed variable with a mean CGPA of 2.7967 and a standard deviation of 0.4872. The normality of

the CGPA as a variable satisfies the assumption that guides the use of the correlational design, and hence the calculation of the correlation coefficient.

The normal distribution curve for the 2019 graduates' CGPA values at the Presbyterian College of Education

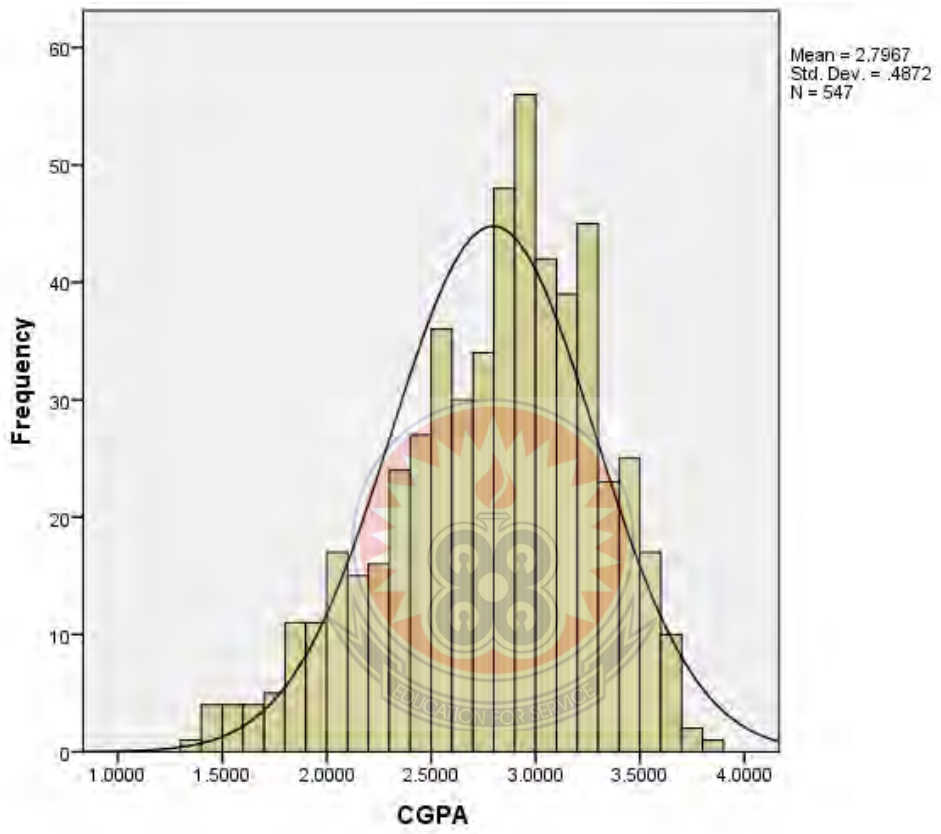

Figure 4.11: Histogram (normal curve) for CGPA for 2016-2019 dataset

Linearity and homoscedasticity are two critical assumptions necessary for testing for the correlational design. The assumptions about linearity and homoscedasticity of the total aggregate WASSCE/SSSCE score and the cumulative grade point average were tested by plotting the scatter plot between the total aggregate and the CGPA for the 2016 and 2019 admission entry grades and the graduating CGPA respectively. The scatter plot for the data set showed that there is a negative correlation between the two

variables. There is an indication of a straight line that can be used to fit the data. There are no extraneous values and the homoscedasticity assumption is also satisfied.

The graph below shows the scatter plot between the 2016 WASSCE/SSSCE entry grades and the 2019 CGPA of the graduating students from the Presbyterian College of Education.

The scatter plot between the 2016 candidates' admission WASSCE scores and the 2019 graduating students' CGPA at the Presbyterian College of Education. The vertical axis represents the CGPA while the WASSCE scores are shown on the horizontal axis

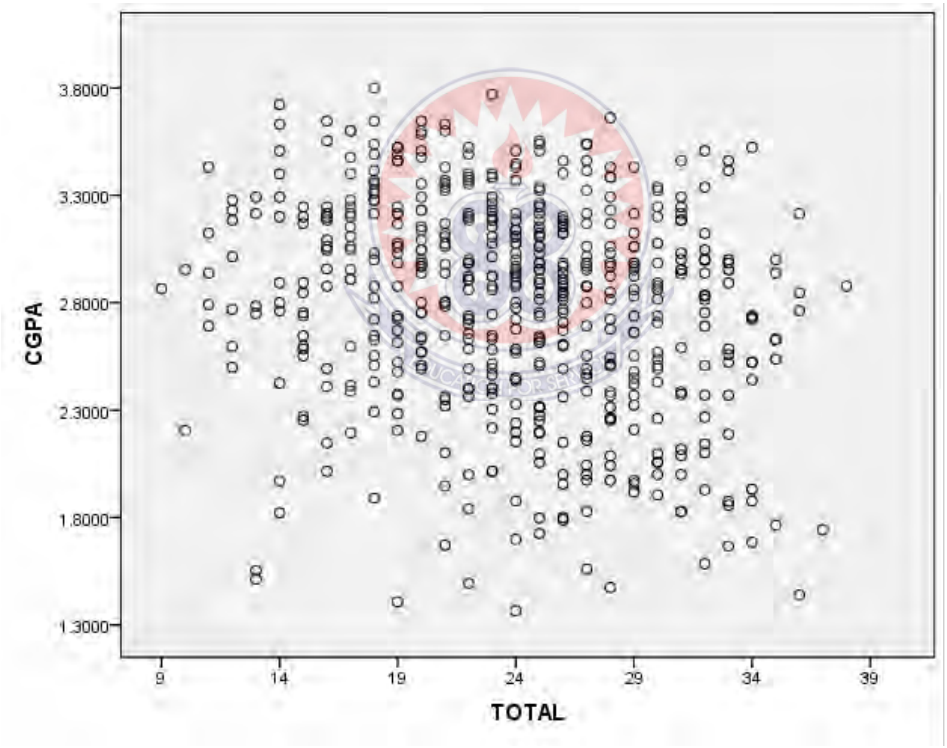

Figure 4.12: Scatter plot of Total Aggregate and CGPA for 2016 – 2019 dataset

In order to determine the kind of relationship between the CGPA of 2019 graduating students' and their corresponding 2016 entry WASSCE/SSSCE grades the Pearson correlation coefficient was computed and the result is presented in Table 4.12

Pearson Correlation coefficient between the 2016 candidates WASSCE admission score and the 2019 graduating students CGPA values at the Presbyterian College of Education

Table 4.12: Correlation between Performance at WASSCE and CGPA results at College of Education for students admitted in 2016 and graduated in 2019

		CGPA	**WASSCE**
CGPA	Pearson Correlation	1	-0.206***
	Sig. (2-tailed)		0.000
	N	547	547

***Correlation is significance at the 0.01 level (2-tailed) Note: N = 547, p < 0.05

From Table 4.12, the Pearson Product Correlation between the students' performance at WASSCE and their CGPA results was found to be.-0.206 which indicates that there is a relatively medium relationship between graduates' WASSCE performance and their CGPA results at the end of the diploma in basic education. , r (547) = -0.206, p = 0.000 P <.05 also shows that there is a significant relationship between the two variables. This shows that for an increase in students' performance at WASSCE there is an increase in their CGPA results at College of Education. These two variables are related. The effect size of the Pearson correlation coefficient r = -0.206 is small since it falls within the range of the absolute value of 0.10 – 0.29.

The mean and standard deviation for WASSCE admission scores and graduates CGPA, and the Pearson correlation coefficient for the 2013-2016, 2014-2017, 2015-2018 and 2016-2019 dataset and the corresponding number of graduates.

Table 13: Summary of results from the histogram and scatter plot for the four dataset

Dataset	Number of students	WASSSCE/SSSCE		CGPA		Pearson Correlation coefficient
		Mean	STDV	Mean	STDV	
2013 – 2016	565	20.7257	5.4744	2.7143	0.4137	-0.397
2014 – 2017	508	22.3400	4.8050	2.7171	0.4816	-0.363
2015 – 2018	477	23.4600	5.2100	2.7632	0.5414	-0.232
2016 – 2019	547	23.9000	5.7650	2.7966	0.4872	-0.206

From Table 13 above, the 2013 – 2016 dataset showed the highest number of students, 565, who graduated with a diploma in basic education from the Presbyterian College of Education. This was followed by the 2016 – 2019 dataset which recorded 547 students. This showed that 18 students less than those who were admitted and graduated in 2013 -2016 dataset. The lowest number of students who were admitted and graduated was recorded in the 2015 – 2018 dataset. A total number of 477 who were admitted in 2015 graduated in 2018.

The best mean for the WSSCE/SSSCE total aggregate for admission into the Presbyterian College of Education for the four years under discussion occurred in the 2013 with the mean value of about 21. The worst mean for WASSCE/SSSCE total aggregate for the same period happened in 2016 with the mean aggregate of about 24. The standard deviation for the 2013 admission year was smaller than that of the 2016 admission year. While the standard deviation for the 2013 admission year was 5.4744, it was 5.7650 in the 2016 admission year. This means that students who were admitted in the 2013 admission year had better WASSCE/SSSCE grades than the 2016 batch of students. However a standard deviation of 4.8050, which is the smallest among the four years of admission, was recorded in the 2014 admission year. This

indicates that candidates who were admitted in that year came with results that were relatively clustered around the mean admission entry grades of about 22.

Table 13 shows the highest mean CGPA of 2.7966 for the 2019 graduating students with a corresponding standard deviation of 0.4872. Even though candidates who graduated with this mean CGPA were admitted with the worse mean WASSCE/SSSCE in 2016, they produce the best mean CPGA among the four years. Ironically the 2016 graduating students were those who were admitted with the best WASSCE/SSCE aggregate but recorded the worst mean CGPA of 2.7143. This indicates a better performance for the 2019 graduating candidates. Further studies can be conducted to determine what may have accounted for the disparities among the performances of these two set of groups since one would have expected that students with better mean admission entry grades would have graduated with a corresponding best mean CGPA.

The Pearson correlation coefficient for the 2013-2016 data set reported the highest absolute value of -0.397 while the lowest value was reported for the 2016-2019 data set. The Pearson correlation coefficient absolute values decreases from 2016 graduating year group through to the 2019 graduating year.

Addressing Research Question 1

Research question one sought to find out if there is a relationship between students' performance at West African Senior School Certificate Examination (WASSCE/SSSCE) and their Cumulative Grade Point Average (CGPA) results at the end of the diploma in basic education at the Presbyterian College of Education. In order to address this research question, a Pearson Product Moment Correlation Coefficient (r) was computed (for data set 1, 2013 – 2016, set 2, 2014 – 2017, set 3,

2015 – 2018 and set 4, 2016 – 2019) to ascertain if there is a relationship between students' performance at WASSCE/SSSCE and their CGPA results at College of Education. The output results as presented in Table 13 for set 1, set 2, set 3 & set 4 altogether revealed that there is a relationship between students' performance at WASSCE and their CGPA results at College of Education. From Table 13, the Pearson correlation coefficients for the four data sets are -0.397 for 2013 -2016, -0.363 for 2014 -2017 dataset, -0.232 for the 2015-2018 dataset and -0.206 for the 2016-2019 dataset. This implies that an increase or a decrease in students' performance at WASSCE/SSSCE would influence an increase or decrease in their CGPA results at College of Education. The two variables, WASSCE/SSSCE and the CGPA therefore relate.

Addressing Research Question 2

Research question two sought to find out if there is any significant difference between males and females cumulative grade point averages (CGPA). From research question one, we observed that there is a relationship between students' performance at WASSCE/SSSCE and their CGPA results at College of Education as shown in Table 13. The study reveals that students' performance at WASSCE/SSSCE contributes to the prediction of their CGPA results at College of Education.

Therefore, since there is a relationship between the two variables it is statistically correct or possible to tell if there is any significance differences between the CGPA of the males and females graduates. This was done by computing the independent – sample t-tests for the mean CGPA of males and females for the four data set. McMillan & Schumacher (2014) states that the t-test for independent groups is used to determine whether the mean value of a variable on one group of subjects is

different from the mean value on the same variable on a different group of subjects. They further state that three statistical assumptions must be met before the t-test is used. These assumptions are:

i. That the frequency distributions of scores for both populations of each group are normal. This assumption is tested by drawing a Histogram with the normal curve showing a bell-shape to indicate that the variable has a normal distribution. This assumption when satisfied guides the researcher to specify a level of probability (alpha level, level of significance, p) as a criterion for acceptance.

ii. That the variances in each population are equal. This assumption is verified by considering the homogeneity of variance. Homogeneous variances exists when the standard deviations of the data are approximately equal.

iii. That the observation of scores in one group is independent of the other group.

The Independent Sample t-Test compares the means of two independent groups in order to determine whether there is a statistical evidence that the associated population means are significantly different.

The assumptions for normality for the mean CGPA for each of the male and female groups of the four data set were tested by plotting a histogram (normal) to check if the bell-shaped picture is seen from the histogram (normal). The homogeneous variances were checked by computing the standard deviation of the samples to find out if they are equal.

Test of assumptions for the t-test for the independent t-test for the mean CGPA for males and females.

The normal curve (histogram) for the female graduates' CGPA for the 2016 graduating year at the Presbyterian College of Education.

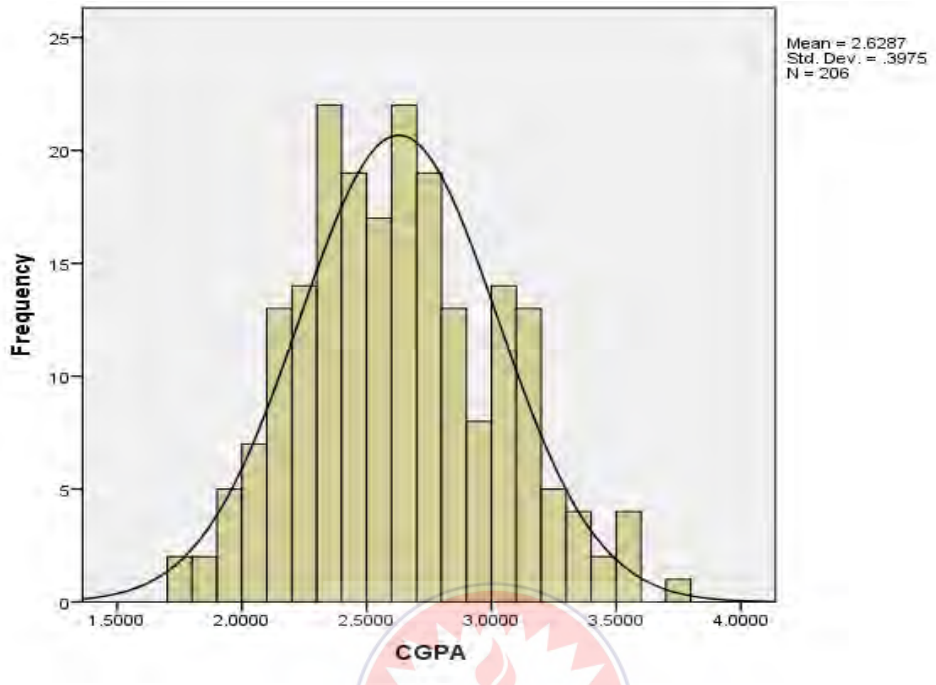

Figure 4.13: Histogram for the female CGPA for 2016 graduating year.

From Fig. 4.13 and Fig. 4.14 for the CGPAs for females and males for the 2016 graduating diploma in basic education, the normality assumption of the variables has been satisfied because the two graphs, Fig 4.13 and Fig 4.14, indicate the bell-shape. The CGPA for the males in Fig.4.14 looks more normal than that for the female CGPA in Fig 4.13

The normal curve (histogram) for the male graduates' CGPA for the 2016 graduating year at the Presbyterian College of Education

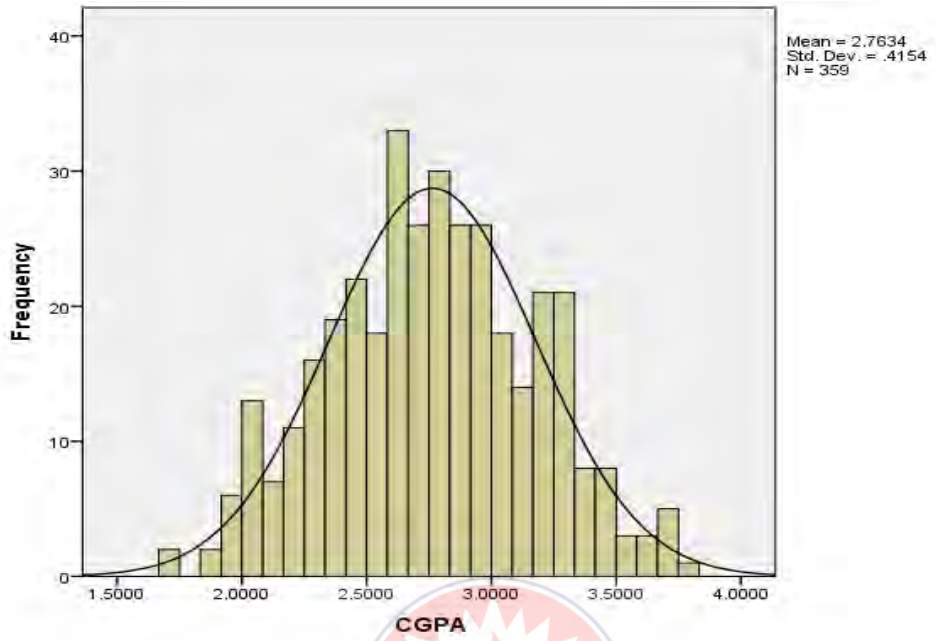

Figure 4.14: Histogram for the male CGPA for 2016 graduating year.

The means, standard deviations and the standard error for the male and female CGPA scores for 2016 graduates for the diploma in basic education at the Presbyterian college of Education

Table 4.14: Descriptive Statistics for mean CPGA for females and males (2013 – 2016 data set)

GENDER		N	Mean	St. Deviation	Std. Error mean
CGPA	Female	206	2.6287	0.3975	0.02769
	Male	359	2.7634	0.4154	0.02193

It can be inferred from the group descriptive Statistics results in Table 4.14 that the 206 females had an average CGPA score of 2.6287, while the 359 males had an average CGPA score of 2.7634. The mean CGPA of the males is higher than the females. In order to ascertain whether the difference in the means CGPA of the males

and the females are statistically significant, an independent sample t-test was conducted. The result of the analysis is presented in Table 4.15

The result of the independent sample t-test for the mean difference of the CGPA values for the 2016 graduates for the diploma in basic education at the Presbyterian College of Education

Table 4.15: Independent-samples t-test for females and males CGPA

		T	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference
CGPA	Equal variances assumed	-3.769	563	.000	-.13473	.03574
	Equal variances not assumed	-3.814	442.866	.000	-.13473	.03532

The independent –sample t-test indicated that mean CGPA were significantly higher for males (M = 2.76, SD = 0.415) than for females (M = 2.63, SD = 0.398), $t(563) = 3.77$, $p < 0.05$.

The normal curve (histogram) for the female graduates' CGPA for the 2017 graduating year at the Presbyterian College of Education.

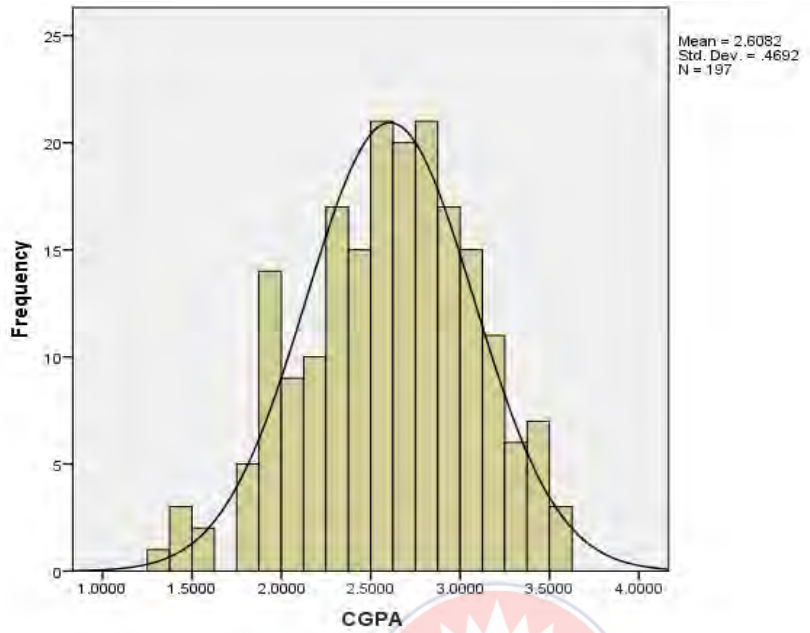

Figure 4.15: Histogram for the female CGPA for 2017 graduating year.

The normal curve (histogram) for the male graduates' CGPA for the 2017 graduating year at the Presbyterian College of Education.

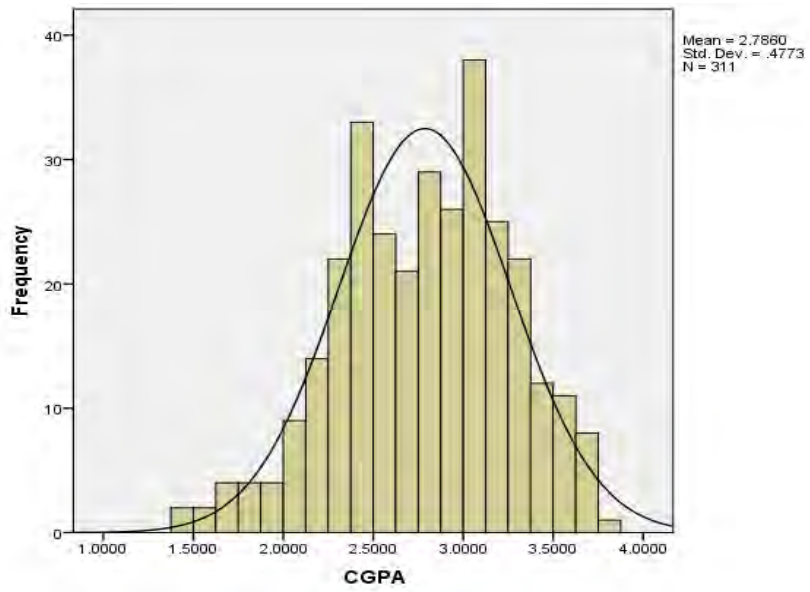

Figure 4.16: Histogram for the male CGPA for 2017 graduating year.

From the two graphs in Fig. 4.15 and Fig. 4.16 above for the CGPA for females and males for the 2017 graduating diploma in basic education at the Presbyterian College of Education, the normality assumption of the variables have been satisfied because the two graphs in Figs. 4.15 and 4.16 indicate the bell-shape. The graph for the CGPA for the females looks more normal than that for the males CGPA.

The means, standard deviations and the standard error for the male and female CGPA scores for 2017 graduates for the diploma in basic education at the Presbyterian college of Education

Table 4.16: Descriptive Statistics for mean CPGA for females and males (2014 – 2017 data set)

GENDER		**N**	**Mean**	**St. Deviation**	**Std. Error mean**
CGPA	Female	197	2.6082	0.4692	0.03343
	Male	311	2.7860	0.4773	0.02706

The descriptive statistics for mean CGPA for females and males for the 2014 -2017 data set indicates that the 197 females had an average CGPA score of 2.61, while the 311 males had an average CGPA score of 2.79. The mean CGPA of the males for this data set is also higher than the females.

The result of the independent sample t-test for the mean difference of the CGPA values for the 2017 graduates for the diploma in basic education at the Presbyterian College of Education

Table 4.17: Independent-samples t-test for females and males CGPA for 2014 – 2017 data set

		t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference
CGPA	Equal variances assumed	-4.118	506	.000	-.17778	.04317
	Equal variances not assumed	-4.133	422.409	.000	-.17778	.04301

The independent –sample t-test indicated that mean CGPA were significantly higher for males $(M = 2.79, SD = 0.477)$ than for females$(M = 2.61, SD = 0.469)$, $t(506) = 4.12, p < 0.05$.

From the two graphs in Fig. 4.17 and Fig. 4.18 the CGPA for females and males for the 2018 graduating diploma in basic education, the normality assumption of the variables has been satisfied because the two graphs indicate the bell-shape. The shape for the CGPA for the females looks more normal than that for the males CGPA.

The normal curve (histogram) for the female graduates' CGPA for the 2018 graduating year at the Presbyterian College of Education.

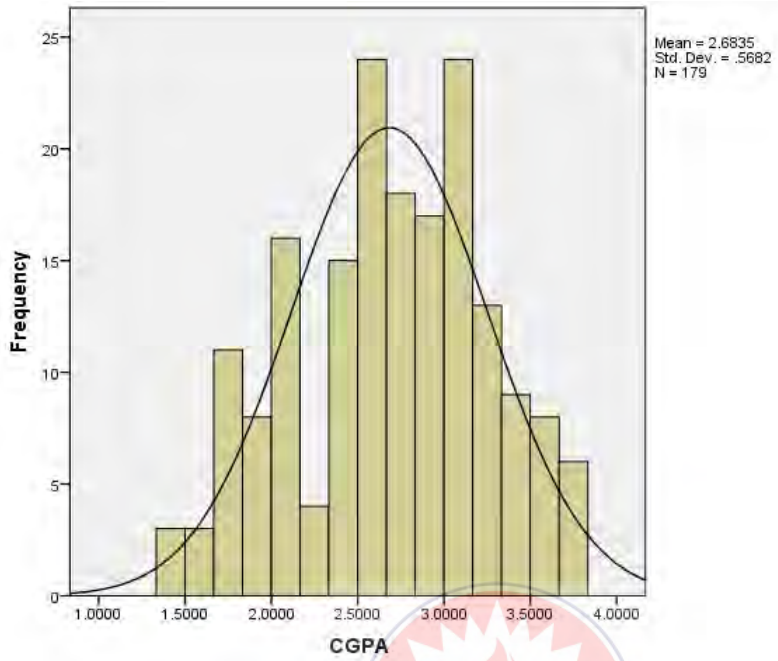

Figure 4.17: Histogram for the female CGPA for 2018 graduating year.

The normal curve (histogram) for the male graduates' CGPA for the 2018 graduating year at the Presbyterian College of Education.

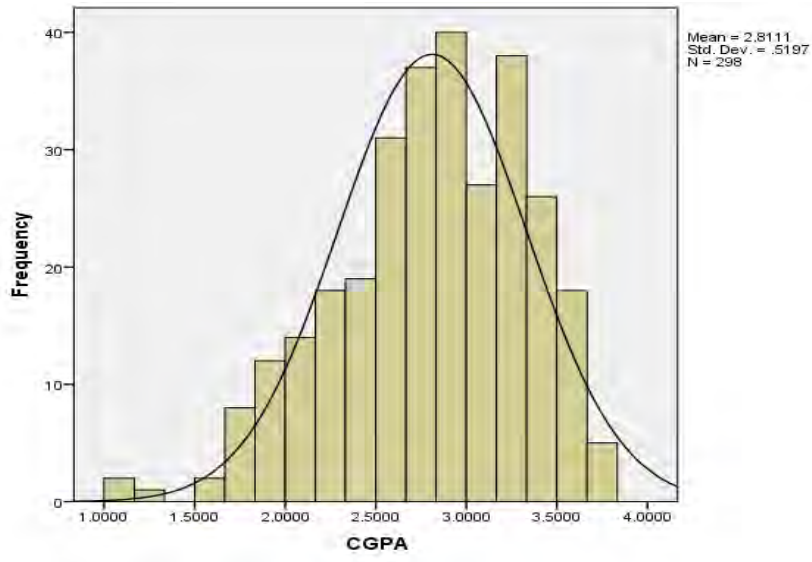

Figure 4.18: Histogram for the male CGPA for 2018 graduating year.

The means, standard deviations and the standard error for the male and female CGPA scores for 2018 graduates for the diploma in basic education at the Presbyterian college of Education.

Table 4.18: Descriptive Statistics for mean CPGA for females and males (2015 – 2018 data set)

GENDER		N	Mean	St. Deviation	Std. Error mean
CGPA	Female	179	2.6835	0.5682	0.04247
	Male	298	2.8113	0.5197	0.03011

The descriptive statistics for mean CGPA for females and males for the 2015 -2018 data set indicates that the 179 females had an average CGPA score of 2.68, while the 298 males had an average CGPA score of 2.81. The mean CGPA of the males for this data set is also higher than the females' CGPA.

The result of the independent sample t-test for the mean difference of the CGPA values for the 2018 graduates for the diploma in basic education at the Presbyterian College of Education

Table 4.19: Independent-samples t-test for females and males CGPA for 2015 – 2018 data set

	t	Df	Sig. (2-tailed)	Mean Difference	Std. Error Difference
Equal variances assumed	2.508	475	0.012	0.12767	0.05091
Equal variances not assumed	2.452	349.010	0.015	0.12767	0.05205

The independent –sample t-test indicated that mean CGPA were significantly higher for males (M = 2.81, SD = 0.520) than for females (M = 2.68, D = 0.568), (475) =

2.51, p<0.05. Hence the mean CPGA for males and females are significantly different.

The two graphs in Fig. 4.19 and 4.20 are the histogram (normal) curve for the CGPA for females and males for the 2019 graduating diploma in basic education at the Presbyterian College of Education. The graphs indicated that the normality assumption of the variables has been satisfied because Figs. 4.19 and 4.20 depicted the bell-shape. The CGPA for the females looked more normal than that for the males CGPA.

The normal curve (histogram) for the female graduates' CGPA for the 2019 graduating year at the Presbyterian College of Education.

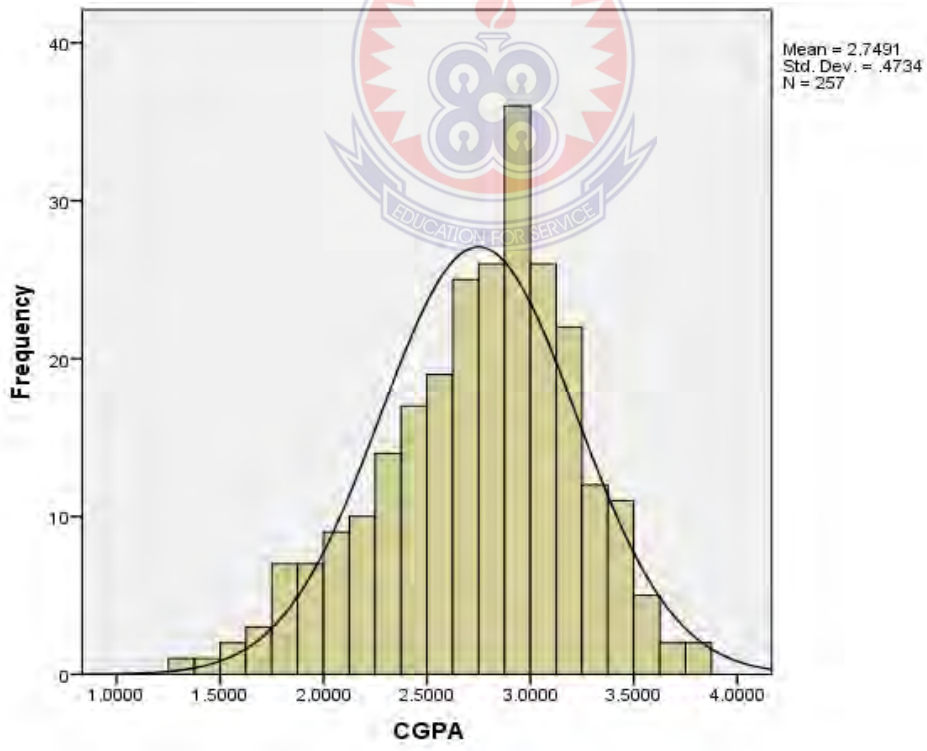

Figure 4.19: Histogram for the females CGPA for 2019 graduating year.

The normal curve (histogram) for the male graduates' CGPA for the 2019 graduating year at the Presbyterian College of Education.

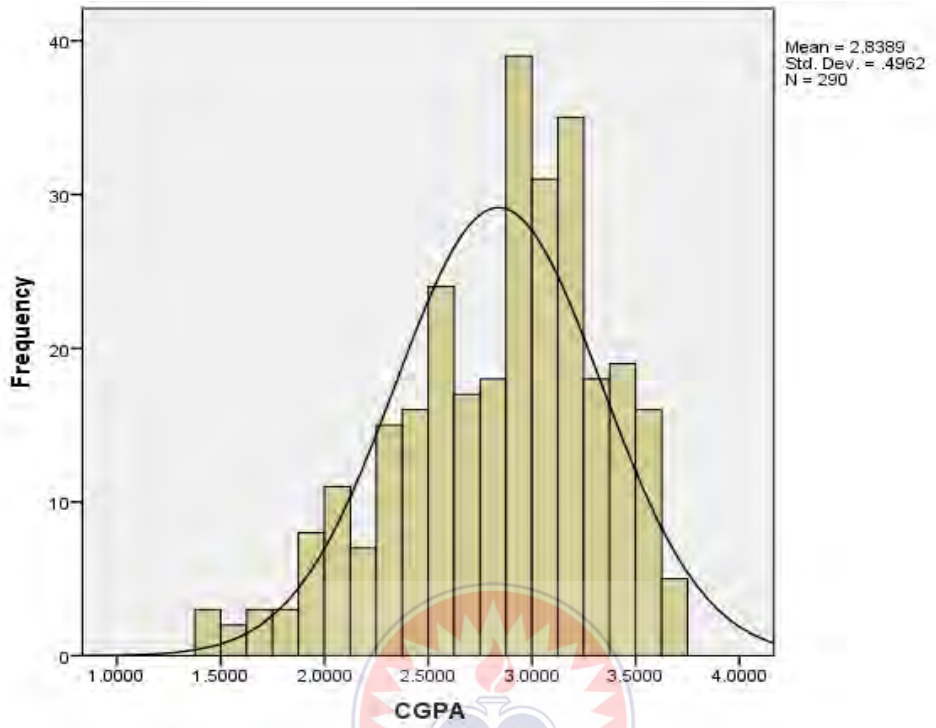

Figure 4.20: Histogram for the males CGPA for 2019 graduating year.

The means, standard deviations and the standard error for the male and female CGPA scores for 2019 graduates for the diploma in basic education at the Presbyterian college of Education.

Table 4.20: Descriptive Statistics for mean CPGA for females and males for 2016 - 2019 data set (2016 – 2019 data set)

GENDER		N	Mean	St. Deviation	Std. Error mean
CGPA	Female	257	2.7491	0.4734	0.02953
	Male	290	2.8389	0.4962	0.02914

The descriptive statistics for mean CGPA for females and males for the 2016 -2019 data set shows that the 257 females had an average CGPA score of 2.75, and the 290 males had an average CGPA score of 2.84. The mean CGPA of the males is higher than the females' CGPA.

The result of the independent sample t-test for the mean difference of the CGPA values for the 2019 graduates for the diploma in basic education at the Presbyterian College of Education

Table 4.21: Independent Sample T-Test for Equality of Means for 2016-2019 data set

		T	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference
CGPA	Equal variances assumed	2.160	545	0.031	0.08986	0.04160
	Equal variances not assumed	2.166	542.02	0.031	0.08986	0.04148

The independent –sample t-test indicated that the mean CGPA were significantly higher for males (M = 2.84, SD = 0.50) than for females (M = 2.75, SD = 0.47), $(545) = 2.160$, $p<0.05$. Hence the mean CGPA for males and females are significantly different.

The results from the studies indicated that, in all the various groups of data, there were significant difference between average CGPA scores of males and females in favour of the males.

The summary of results from Tables 4.14, 4.16, 4.18 and 4.20 showing the number of males and females for the four years of graduation and the mean CGPAs for the respective years by gender and their corresponding standard deviations. (Academic performance by gender)

Table 4.22: Summary of results

Graduating year	**Number of graduates**			**Mean CGPA**		**Standard deviation**	
	Males	**Females**	**Total**	**Males**	**Females**	**Males**	**Females**
2016	359	206	565	2.7634	2.6287	0.4154	0.3975
2017	311	197	508	2.7860	2.6082	0.4773	0.4692
2018	298	179	477	2.8111	2.5835	0.5197	0.5682
2019	290	257	547	2.8369	2.7491	0.4962	0.4734

From Table 4.22, the graduation year 2016 recorded the highest number of students while 2018 recorded the least number of students graduating from the Presbyterian College of Education. While the highest number of females (257) graduated in 2019 the least female number of graduates (179) was recorded in 2018. The highest number of male graduates was recorded in 2016 while the least number of male graduates was recorded in 2019 over the four year period. However the differences between the number of female and male students reduced marginally from 2016 to 2019. In 2016 the difference between the male and female graduates was 153. It reduced to 114 in 2017, increased marginally to 117 in 2018 and reduced drastically to 33 in 2019. Hence the gender parity ratio was reduced for the 2016-2019 admission and graduation years.

The highest mean CGPA for both males and females from Table 4.22 were recorded in 2019. The mean CGPA for males was 2.8369 and that for the females was 2.7491. However, while the least mean CPGA for the males was recorded in 2016, with a

value of 2.7634 that for the females was recorded in 2017 with a mean CGPA of 2.6082. There was a marginal increase of the mean CGPA for the males from 2016 through to 2019. This was not the case for the females' mean CGPA over the same period. There was a marginal decrease of the mean CGPA from 2.6287 in 2016 to 2.6082 in 2017 for the females but marginal increases were recorded from 2017 through to 2019. The differences between the mean CGPA for the corresponding years for males and females for the four years from 2016 to 2019 are respectively, 0.1347, 0.1778, 0.1276 and 0.0878. The least difference between the mean CGPAs of males and females over the periods occurred in 2019. This was the year in which the disparities between the number of males and females graduates were the least, 33. Could there be a possibility that when the ratio of males and females at the Presbyterian College of Education is almost 1:1, this will lead to an increase in the average academic performance of the females?

The normal curve (histogram) for the female candidates' WASSCE admission scores for the 2013 admission year at the Presbyterian College of Education.

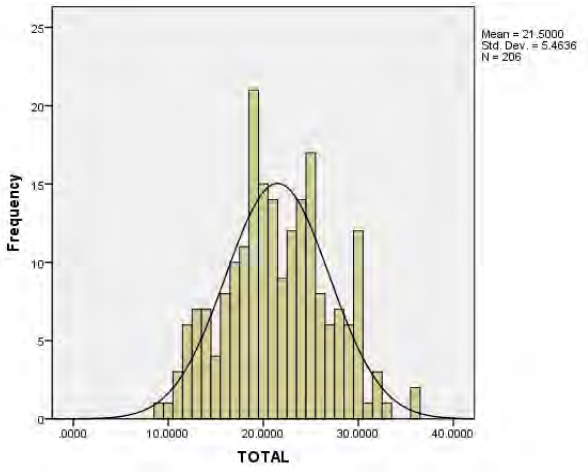

Figure 4.21: Histogram for the females WASSCE/SSSCE for 2013 admission year.

The normal curve (histogram) for the male candidates' WASSCE admission scores for the 2013 admission year at the Presbyterian College of Education.

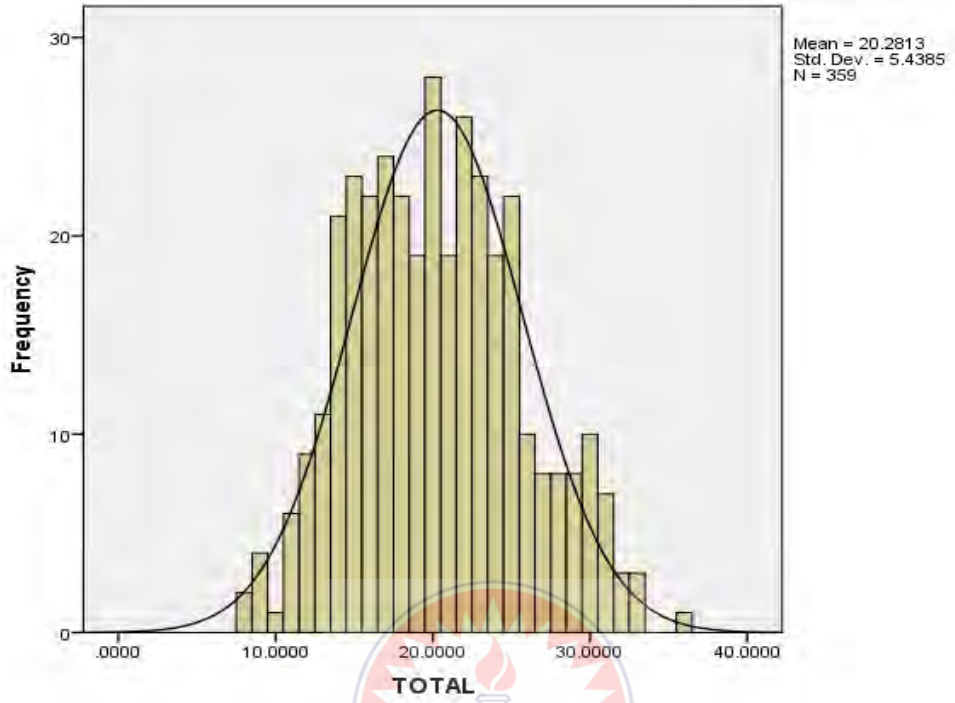

Figure 4.22: Histogram for the males WASSCE/SSSCE for 2013 admission year.

Figs 4.21 and 4.22 above show the histogram (normal) for the female and male WASSCE/SSSCE for the 2013 admission years. Both graphs show that the variable are normally distributed. The mean WASSCE results for the male is 20.28 while the female is 21.50. The WASSCE performance for the males for were better than the females for the 2013 admission year.

The 2014 admission WASSCE grades for females and males also follow the normal distribution. This is evident from the graphs below. The shape of the graphs are bell-shaped and do not skewed significantly. The mean WASSCE entry grades for admission for the males and females were almost the same. While the male mean entry grades was 22.3 it was 22.4 for the females. However their standard deviations were different, 5.071 for males and 4.363 for the females.

The normal curve (histogram) for the male candidates' WASSCE admission scores for the 2014 admission year at the Presbyterian College of Education.

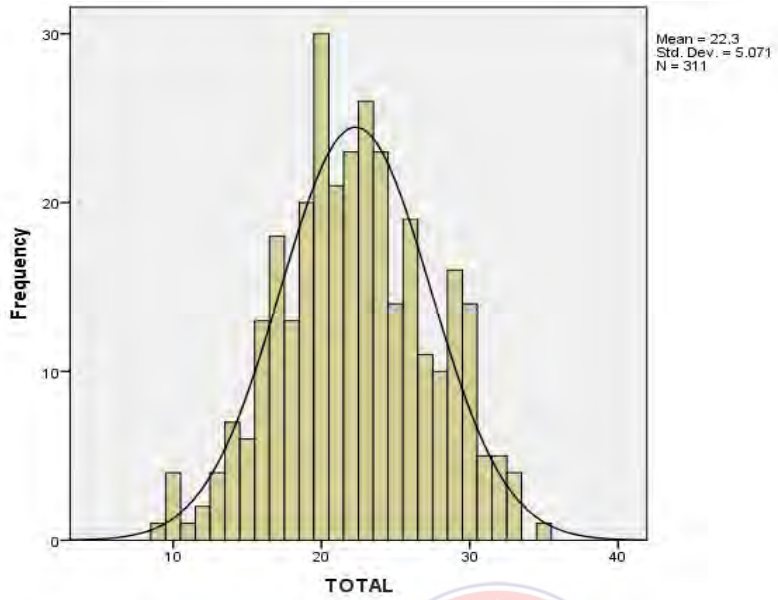

Figure 4.23: Histogram for the males WASSCE/SSSCE for 2014 admission year.

The normal curve (histogram) for the female candidates' WASSCE admission scores for the 2014 admission year at the Presbyterian College of Education.

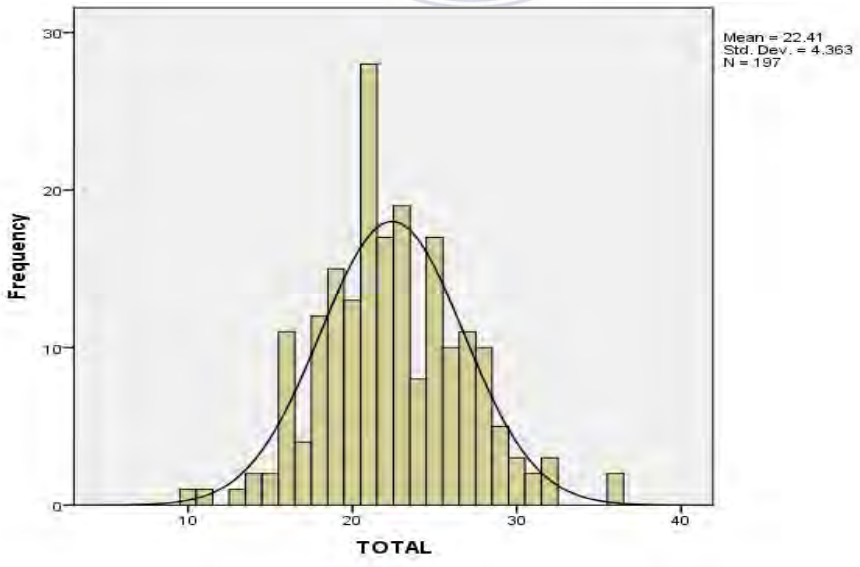

Figure 4.24: Histogram for the females WASSCE/SSSCE for 2014 admission year.

Figs. 4.25 and 4.26 indicate that the normal graphs for the 2015 admission WASSCE/SSSCE grades for both male and female are also bell-shaped, giving an indication of the normality of the data. Both groups showed approximately mean WASSCE/SSSCE entry grades for admission into college. The mean WASSCE grade for the male was 23.13 while that of the female group was 23.98. Relatively the male group entered with a marginal better grades than the females.

From the graphs in Fig. 4.25 and 4.26 of the 2015 WASSCE admission grades, both gender groups were admitted with approximately equal mean WASSCE entry grades. The mean WASSCE entry grades for the males was 23.13 while that of the female was 23.98. However their standard deviations were not that close. The male reported a standard deviation of 4.929 while the female reported 5.621

The normal curve (histogram) for the female candidates' WASSCE admission scores for the 2015 admission year at the Presbyterian College of Education.

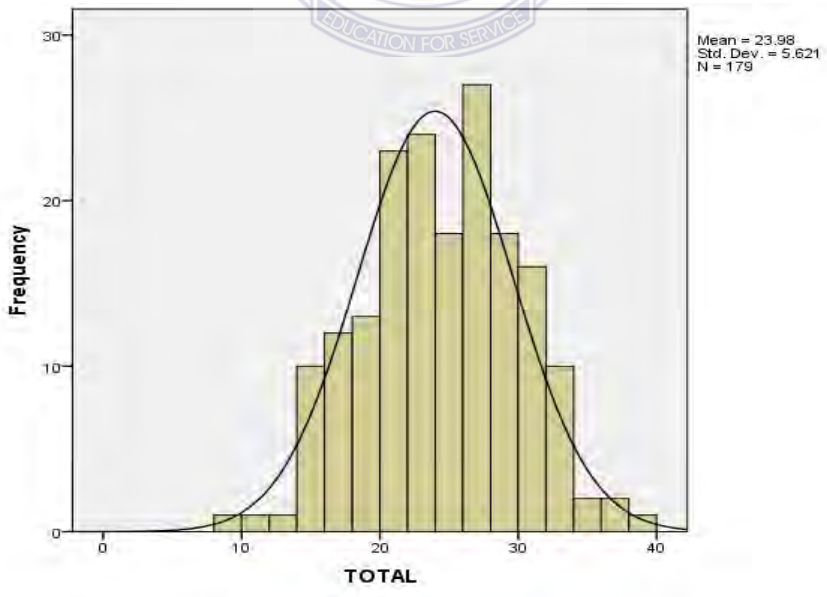

Figure 4.25: Histogram for the females WASSCE/SSSCE for 2015 admission year.

The normal curve (histogram) for the male candidates' WASSCE admission scores for the 2015 admission year at the Presbyterian College of Education.

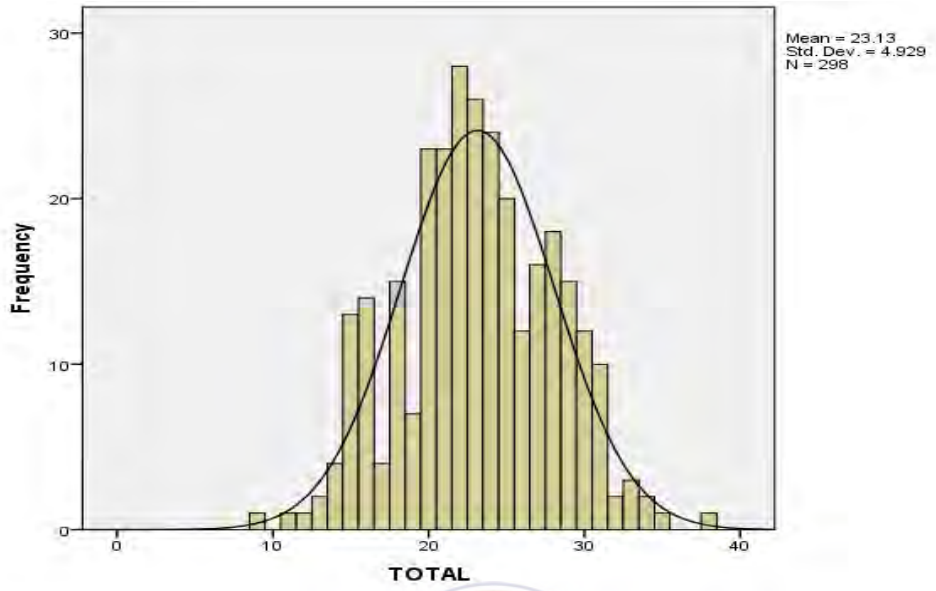

Figure 4.26: Histogram for the males WASSCE/SSSCE for 2015 admission year.

The figure for the 2016 admission year for male and female groups depicted a normality of the variable. The mean WASSCE entry grade for admission for the males were relatively better than that of the females. The males reported 23.74 and the females' was 24.07.

The normal curve (histogram) for the male candidates' WASSCE admission scores for the 2016 admission year at the Presbyterian College of Education.

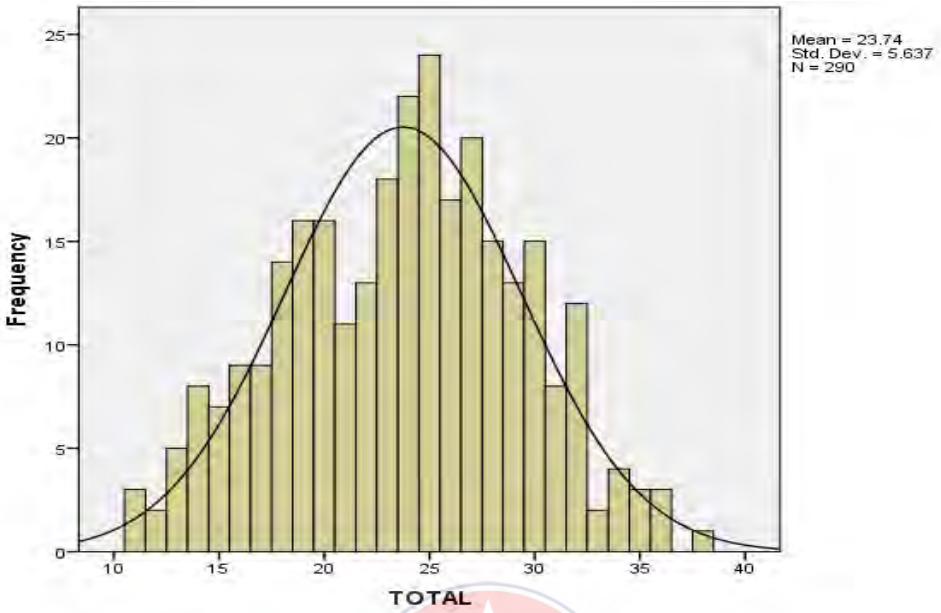

Figure 4.27: Histogram for the males WASSCE/SSSCE for 2016 admission year.

The normal curve (histogram) for the female candidates' WASSCE admission scores for the 2016 admission year at the Presbyterian College of Education.

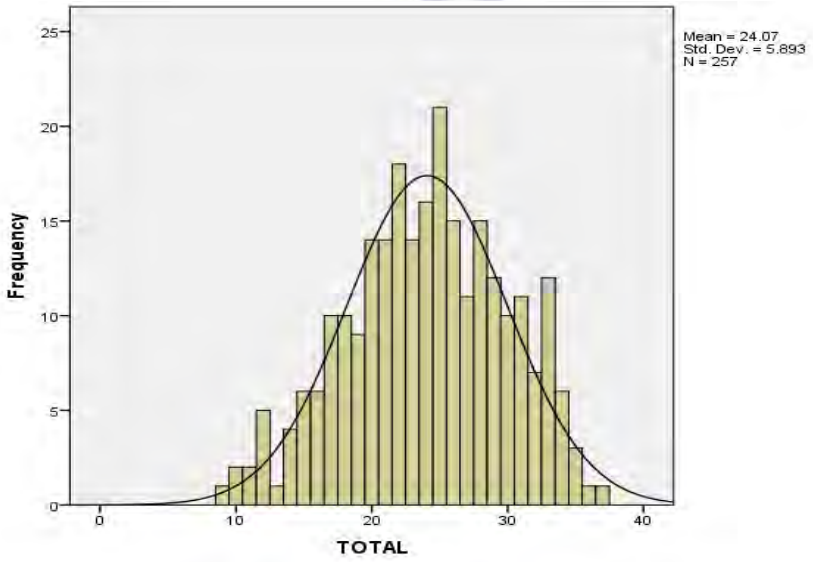

Figure 4.28: Histogram for the females WASSCE/SSSCE for 2016 admission year.

The summary of the results from Figs 4.21 to 4.28 showing the number of males and females for the four years of admission and the mean WASSCE/SSSCE admission scores for the respective years and corresponding standard deviations.

Table 4.23: Summary of the results

Admission year	Number admitted			Mean WASSCE		Standard deviation	
	Males	Females	Total	Males	Females	Males	Females
2013	359	206	565	20.28	21.50	5.4395	5.4836
2014	311	197	508	22.30	22.41	5.0710	4.3630
2015	298	179	477	23.13	23.98	4.9290	5.6210
2016	290	257	547	23.74	24.07	5.6370	5.8930

From Table 4.23 it was realized that the admission grades for entry into the Presbyterian College of Education from 2013 to 2016 saw a relative decline in the quality of results of applicants. The male average entry grades reduced from 20.28 to about 23.74 from 2013 to 2016. Similar was seen about the mean admission entry grades for the females, reducing marginally in quality from the mean entry grades of 21.50 in 2013 to 24.07 in 2016. This calls for further studies to ascertain the causes of candidates' performance at the WASSCE level worsening. One would have expected that the huge investment made into the senior high secondary schools over the years will see an improved performance in candidates' performance, but the opposite is the case as seen in the mean WASSCE admission scores at the Presbyterian College of Education from 2013 to 2016.

CHAPTER 5

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.0 Overview

This chapter considers the summary and the conclusion of the vigorous study. It also makes some recommendations based on the findings so as to ensure that the significance of the study is not shelved, but properly utilised to enhance dynamic admission and training process at the Presbyterian college of Education.

5.1 Summary

The purpose of the study was to find out if the grades that students use to gain admission into the college of education can predict their final GPA for the Diploma in Basic Education at the Presbyterian College of Education. The study was carried out using the correlational design. The purposively sampling method was used to select documentary data which were the admission entry grades (WASSCE/SSSCE) from Akropong Presbyterian College of Education for students who were admitted in 2013, 2014, 2015, and 2016. The same sampling method was used to select the second set of data which consisted of records of Cumulative Grade Point Average (CGPA) of the students who graduated from the year 2016 to 2019. This data was obtained from the Institute of Education, University of Cape Coast. A total sample size of 2,097 students in sets “2013-2016”, “2014-2017”, “2015-2018”, and “2016-2019” were selected for the study.

The Statistical Package for the Social Sciences (SPSS version 22.0) computer software was used to analysis of the data collected. A Pearson Product Moment Correlation Coefficient (r) was computed for the WASSCE/SSSCE scores for admission and the CGPA for each dataset to establish if there was a statistical

relationship between the WASSCE results and the CGPAs. This enabled the researcher found out the relationship between students' performance at the West African Senior School Certificate Examination (WASSCE/SSSCE) and their Cumulative Grade Point Average (CGPA) results for the diploma in basic education program from 2016 to 2019 graduating years at the Presbyterian College of Education.

The analysis revealed that there is a negative correlation between the WASSSCE/SSSCE results of candidates and their CGPA at the end of the diploma in basic education programme. This is evident in Table 13 in which the Pearson Correlation coefficient were -0.397, -0.363, -0.232 and -0.206 for the respective graduating years of 2016, 2017, 2018 and 2019. This negative correlation indicate that a smaller value of WASSSCE results (which indicate a better performance at WASSSCE) will lead to a higher value of CGPA at the end of the diploma in Education programme. Again a decrease in students' performance at WASSCE (high value of WASSSCE score) would lead to a smaller value in the CGPA. Hence an increase or decrease in students' performance at WASSSCE would marginally influence an increase or decrease in their CGPA results at College of Education since the two variables negatively correlate.

A descriptive statistics, mean CGPA, was used to relationship between the CGPAs of the males and females graduates for 2016 to 2019. The mean CGPA of the males and females for each graduating year was computed. Table 4.14 indicates a male mean CGPA of 2.7634 and 2.6287 for the female CGPA. The mean CGPA for the males is higher than the females for the 2016 graduating diploma in basic education at the Presbyterian College of Education. From Table 4.16 the mean CGPA for the male is

2.7860 and that for the female is 2.6082 for the 2017 graduate for the diploma in basic education. Here too the mean CGPA for the males is higher than the female CGPA. For the year 2018 graduation year, Table 4.18 indicates that the mean CGPA for the males is 2.8113 and 2.6835 for the females. The CGPA of the males is marginally higher than that of the female graduates. Table 4.20 reports a mean CGPA of 2.8389 for the males and 2.7491 for the females for the 2019 graduates. This also show the female graduates mean CGPA being lower than their male counterparts. The independent-sample t-test was computed for each set of the mean CGPA for males and females. The results in Tables 4.15, 4.17, 4.18 and 4.19 all show that the mean CGPA of the males differ from the females and the males mean CGPA are higher in each graduating year from their female counterparts.

From the above results and discussions, the relationship between the WASSCE results and the CGPA of the diploma in basic education graduates is due to gender. The males WASSCE results for entry are relatively better than the females and the corresponding CGPA for males also better than females.

5.2 Findings

The main motive of a research work is to find answers to the research questions. This study had four research questions which guided the study. The findings in respect of the research questions are as follows;

Research question one:

Research question one sought to find out if there is a relationship between students' performance at West African Senior School Certificate Examination (WASSCE) and their Cumulative Grade Point Average (CGPA) results at the end of the diploma in basic education at the Presbyterian College of Education. The correlation coefficients

that measured the strength of relationship between the admission grades and the graduation CGPA of the students for the four years were found as -0.397 for 2013-2016 data set, -0.363 for 2014-2017 data set, -0.232 for the 2015-2018 data set and -0.206 for the 2016-2019 data set as recorded in Table 13. The 2013-2016 data set gave the highest Pearson correlation coefficient value while the 2016-2019 data set reported the least Pearson correlation coefficient. The results indicated that there is a correlation between the students' entry WASSCE/SSSCE grades and their college CGPA. The analysis showed that with an increase in students' performance at WASSCE, there is a corresponding increase in their CGPA results at College of Education at the end of the Diploma in Education programme. This was evidenced in the results obtained from the analysis. In the 2013-2016 data set analysis, the mean WASSCE/SSSCE entry grade for admission of 20.72 was the best among the four data set and its corresponding Pearson correlation coefficient (-0.397) is also the strongest among the four data set. The 2016-2019 data set reported the least mean WASSCE/SSSCE entry grades for admission (23.9) and its corresponding CPGA of (-0.206) is also the least among the four data set. There is therefore a relationship between the WASSCE results and the CGPA at the Presbyterian College of Education. The results also indicated that if students with better admission entry grades are admitted into the colleges of education they are more likely to graduate with a better grades which in effect is likely to give the country the quality of teachers who handle pupils in the basic schools and therefore improve the quality of teaching and learning that takes in our schools.

Research question two:

Research question two sought to find out if there is any significant difference between the males and females CGPA for the diploma in basic education at the Presbyterian

College of Education. The results from the analysis indicated that the mean CGPA for male candidates were relatively higher than the mean CGPA for the female candidate for the four data set as recorded in Table 4.22. The 2013-2016 data set reported a mean CGPA of 2.7634 for males and 2.6287 for females. In 2014-2017 data set the reported mean CGPA for males was 2.7860 while that for the females mean CGPA was 2.6082. The results for the 2015-2018 and 2016-2019 data sets were not different. The 2015-2018 data set showed a mean CGPA of males as 2.8111 and 2.6835 for the females. The mean CGPA for the males and females were 2.8369 and 2.7491 respectively for the 2016-2019 data set. In all instances the p-value was less than 5% ($p<0.05$).

The results from the analysis also revealed that when the difference between females and males students were reduced there was a relatively marginal differences between their mean CGPAs. In the 2016-2019 data set 290 male and 257 female students graduated. The difference between them was 33. Their corresponding mean CGPAs were the highest among the four data set as shown in Table 4.22. A mean CGPA of 2.8369 and 2.7491 were recorded for males and females respectively. The difference between these mean CGPAs for the males and females for the 2016-2019 data set was 0.0878. It was the least difference in the mean CGPAs reported among the four data sets as recorded in Table 4.22. The difference between the mean CGPAs for males and females for the other three data sets were 0.1347 for 2013-2016, 0.1778 for 2015-2017, and 0.1276 for 2015-2018. The differences in gender for these data sets were 153, 114, and 117 all in favour for males for the respective years. It could be inferred from the above that as the difference between the number of males and females students admitted are reduced almost to a ratio of 1:1 their mean CGPAs were

improved and the difference between them was also reduced. Further studies could be carried out to find out what might have caused this.

Research question three:

The research question three seeks to find out if there is any significance difference among the West Africa Senior High Secondary School Certificate examination results candidates were admitted into the Presbyterian College of Education to study for the diploma in basic education from 2013 to 2016? In answering this research question, the researcher used the results from the Table 13. The mean WASSSCE/SSSCE score for the four admission years from 2013 to 2016 were calculated. The mean WASSSCE/SSSCE admission score for the four years are; 20.7257 for 2013, 22.3400 for 2014, 23.4600 for 2015 and 23.9000 for the 2016. The 2013 admission year recorded the best mean WASSSCE admission score among the four years. The worse mean admission score was recorded in the 2016 admission year with a value of 23.900. One would have expected that with the huge investment government and other stakeholders in education put in the development of the educational infrastructure and the numerous training workshop organized for teachers to improve upon the quality of teaching at the senior high schools, there would be a corresponding improvement in the results candidates apply to gain admission into the College of education. However the opposite was the case as seen from the above results and discussions. Further studies should be carried out to establish the reason for this trend. It can be concluded that there is a significance difference among the West Africa Senior High Secondary School Certificate examination results candidates were admitted into the Presbyterian College of Education to study for the diploma in basic education from 2013 to 2016

Research question four:

The research question four tries to find out if there any significance difference among the academic performance (CGPA) for the graduates of the diploma in basic education programme at the Presbyterian College of Education from 2016 to 2019. Academic performance at the College of Education is determined by the CGPA a candidate obtain at the end of the study of a program. While the GPA determines the academic performance of students at the end of a given semester, the CGPA determines the overall academic performance of a student at the end of the programme. In answering the research question four, the mean CGPA for the candidates for the four graduating years were computed and compared. From Table 13, the mean CGPA for 2016 was 2.7143, 2.7171 for 2017, 2.7632 for 2018 and the 2019 value was 2.7966. It can be inferred from the above that the smallest mean CGPA was recorded in 2016 while the highest CGPA was recorded in 2019. The results in Table 13 also showed that there was a marginal improvement in performance from 2016 to 2019. The mean CGPA for 2016 and 2017 was almost the same, 2.7143 and 2.7171 for 2016 and 2017 respectively. However there was a sharp improvement in 2018 from the 2017 mean CGPA. 2018 mean CGPA was 2.7632 while 2017 was 2.7171. There was a relatively higher improvement in academic performance in 2019 as compared to the 2018 mean CGPA. The mean CGPA for 2019 was 2.7966 and 2.7632 for 2018. From the results and discussions it be concluded that the mean CGPA of the academic performance (CGPA) for the graduates of the diploma in basic education programme at the Presbyterian College of Education from 2016 to 2019 are significantly different.

However there is the need to find out what may have accounted for the marginal improvement in the academic performance of the graduates from 2016 to 2019 when

the admission grades seems to be worsening from the 2013 to 2016 corresponding admission year. It is important that further studies are carried out at the colleges of education to ascertain the contributing factors leading to the improvement of candidates' academic performance when their admission WASSSCE grades seems not to be improving.

5.3 Conclusion

The results have revealed that there is nothing wrong with the process of admitting students into the college of education to pursue the Diploma in Basic Education programme. This is because student who entered with better scores at the WASSCE were able to come out with commendable CGPAs. This put to rest the credibility issues of the WASSCE. However, it is clear that the training given to students was able to have positive impact on them at the college of education. This is because as the entry grades of candidates (academic performance at the WASSSCE) reduces marginally from 2013 to 2016 admission years, the corresponding academic performance, measured by the CGPA, of students from 2016 to 2019 improves marginally at the Presbyterian College of Education. Issues about gender parity at the Presbyterian college of Education must be considered and much attention paid. In the 2019 graduation year where the difference between the male and female graduates was the least, 33, among the four years, the overall academic performance as measured by the CGPA was the best, 2.7966 as recorded in Table 13. The academic performance for the males and females in terms of their CGPA were also the best among the four years from 2016 to 2019. The males CGPA was 2.8369 and the females CGPA was 2.7491 as seen in Table 4.22. The students coming out of the three year training must be reformed enough and to be fortified with the pedagogical content knowledge and skills for teaching. This is the only way these teachers can

inspire learning at the basic schools. It is therefore necessary that the colleges looked into their training programs (content) as well as the mode of assessment to ensure that the pre service teachers are up to the task. Moreover, the National Teaching Council (NTC) and the Ghana Education Service should monitor and also make sure that the colleges are equipped with the requisite tools to deliver their mandate.

5.3 Recommendations

Based on the findings, the study recommends the following;

1. The admission requirements must be maintained, however the ratio of males to females admitted must be looked at since it has effect on the academic performance of the students.
2. The content of training at the college must be maintained and the teachers continue with their professional development session to ensure that students admitted continue to receive the best of training and leave college with the same dose of pedagogical knowledge and skills irrespective of their entry grades. T-TEL and other stakeholders should continue to support the provision of teaching and learning resource at the Colleges of Education.
3. Special attention must be paid to gender issues to bring the females in line with their males' counterparts in terms academic achievement.

5.4 Recommendation for Future Research

There must be a study to look at the nature of training giving to the students at the college and the factors that enables students who are admitted with weaker grades graduating with a relatively better academic CGPAs. The training at the Colleges of Education must also be looked at in contrast to international standards and best practices.

Studies must be conducted to find out why the admission grades for entry into colleges of education has been declining for the past four years at the Presbyterian College of Education. This can be done in other colleges to find out if the same observation exist.

When the ratio of male to female admission was almost 1:1, the difference in performance in both gender was very minimal as compared to instances where thee variation was a little be great. Further studies should be carried out to find out some of the possible causes of this development. The study can be replicated in the other levels of education such as the junior high schools and the senior high schools to ascertain the effect of gender parity on students' academic work.

One would have expected that candidate's admission grades from the WASSSCE over the years will be improving as it was not the case in this study for the candidates who were admitted into the Presbyterian College of Education from 2013 to 2016. Hence a study should be conducted to find out the possible causes of the declining academic performance of WASSSCE students.

This study can be replicated in other colleges of education to find out if the observation made in this study reflect in the other colleges of education.

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