UNIVERSITY OF EDUCATION, WINNEBA

AN EVALUATION OF THE COMPUTERISED SELECTION OF STUDENTS INTO COLLEGES OF EDUCATION. A CASE STUDY

SOLOMON OFORI JNR GYANE

MASTER OF SCIENCE DISSERTATION

2021

UNIVERSITY OF EDUCATION, WINNEBA

AN EVALUATION OF THE COMPUTERISED SELECTION OF STUDENTS INTO COLLEGES OF EDUCATION. A CASE STUDY

SOLOMON OFORI JNR GYANE

A dissertation in the Department of Information Technology Education, Faculty of Applied Sciences and Mathematics Education, submitted to the School of Graduate Studies in partial fulfilment of the requirements for the award of the degree of Master of Science (Information Technology Education) in the University of Education, Winneba

MAY, 2021

DECLARATION

STUDENT DECLARATION

I, **SOLOMON OFORI JNR GYANE,** declare that this dissertation, with the exception of quotations and references contained in the 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 dissertation as laid down by the University of Education, Winneba.

DR. EBENEZER BONYAH

SIGNATURE:……..

DATE:……..

DEDICATION

This work is dedicated to my departed brothers whose sad event occurred in the year of the research writing***: Emmanuel Osafo Gyane and Christian Asante Gyane***. May your souls rest in peace.

ACKNOWLEDGEMENT

It will be necessary to give credit to all whose contributions have complimented my efforts. I mention, first, Professor Kofi Obeng, my Uncle, who mooted the idea for me to research into this area. Bani, Boat, KB, Klu (all the ICT Department) and others, all colleagues, were most encouraging. I remember vividly also the immeasurable sacrifice of the following persons in my family: Victoria Debrah Gyane, comfort Amoafoa Gyane, David Sarpong Gyane, Marian Akyema Gyane, Stella Bremang Gyane, Elizabeth Prempeh, Solomon Ofori Gyane Snr, Gladys Gyane and above all Emmanuel Botchwey and George Somuah of Abetifi Presbyterian College of Education for proofreading the material. You are all blessed. Again, I cannot forget excellent services of my project supervisor, Dr Ebenezer Bonya of the University of Education-Winneba (Kumasi Campus), for his tireless efforts in making sure good work is achieved, God bless you.

Doubtless, my human relations suffered, and I became more of a recluse. In all this, my wife, and my three children had to support and understand me.

The Almighty God has seen all this and will reward accordingly.

Solomon Ofori Jnr, Gyane, Abetifi Presbyterian College of Education -Abetifi

TABLE OF CONTENTS

CONTENT **PAGE**

LIST OF TABLES

TABLE **PAGE**

ABSTRACT

Computerized selection system is a school admission system that consists of a collection of different hardware and software requiring disparate supporting infrastructures and offering little in the way of integration. Computerized admission process at the various college of education in Ghana starts with sorting applications based on applicants' choices, grades, and college requirements for specific programme. The system sometimes force some candidates initially selected to concede their place to others far behind in the list. Applicants who are not selected for their first-choice programme are put in a pool for second choice selection. The study evaluated the efficiency, reliability and challenges of using computerized system for admitting students into public Colleges of Education, with particular reference to the educational colleges affiliated with the University of Cape Coast. The study used explanatory research with a quantitative research method. The total population for the study was 255 admission officers, quality assurance staff, and Heads of departments. The researchers' sample size for the study was 192. Questionnaire was used for the data collection instrument. Quantitative analysis was done with the use of the Statistical Package for Social Sciences. The results revealed that verification of college requirements using a computerised selection system had a high factor as compared to other factors to the efficiency of electronic sorting and selection of admission applications at colleges of education. The study concluded that the use of computerised selection for issuing admission letters after admission at the college of education in Ghana makes electronic sorting and selection of applications efficient. The study recommended that a computerised selection system should be upgraded and updated to enhance its' efficiency and reliability.

CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

The rapid and ongoing advent of computers (Ali & Gupta, 2020) and data communications technologies have triggered drastic changes in the computerization processes of organizations (Davydova, Kashchena, Staverska, & Chmil, 2020) and created a virtual Tower of Babel that information technology (IT) managers are struggling to decipher. In most corporations, the computerized selection system (CSS) consists of a collection of different hardware and software requiring disparate supporting infrastructures and offering little in the way of integration (Zviran, Zviran, & Aviv, 2016). University admission is no exception, but it is organized very differently throughout the world. According to Roth and Peranson (1999), prospective students in the US apply directly to their chosen universities compared to undergrads in the United Kingdom, who apply to a UCAS (Universities and Colleges Admission Service) central authority and merely indicate their university preferences.

The Central Clearing house ('ZVS') in Germany allocates students in specific subjects to universities with a lack of university places (Roth & Peranson, 1999). The situation in Ghana is synonymous with that of undergraduate admissions in the US and graduate admissions in the UK, where applicants apply directly to their university of preference. According to Lombardi (2007), this approach is quite common in many developing countries as it has made it increasingly difficult to gain entry into public colleges and universities for the past decade because of the growing numbers of applicants seeking admissions and the lack of growth in these institutions. In Ghana, using data from the West African Examination Council (WAEC, 2012), the number of students who wrote

exams in pursuit of College of Education admission rose from under 50,000 in 2004 to 74,385 (Babah, Frimpong, Mensah, & Sakyi-darko, 2020). These candidates were from 652 schools including 23 and 74 specially established for the visually impaired and hearing respectively. Additionally, the cost of attending a private college of Education in Ghana far outweighs that of public colleges of Education (Muhangi, 2020). For example, whiles the average yearly tuition cost per student at a public college of education is one thousand four hundred Ghana cedis (¢1400.00), the comparable tuition at the private college of education is three thousand, eight hundred Ghana cedis (¢3,800.00) – a percentage difference of one hundred and fifty-seven (157%).

When calculated for four years of undergraduate study, this high tuition cost of private colleges increases the desire to attend public colleges of education (Babah et al., 2020). This desire together with these institutions well-resourced in terms of human and physical capital compared to private education colleges, and the perceived education quality and infrastructure at the public colleges of education add to their ever-increasing applications for admission (Olawoyin & Eze, 2020). In Ghana, the criteria for entry into public colleges of education are generally the same – mainly using records from WAEC-organized exams, and benchmarks from the National Accreditation Board (NAB) (Babah et al., 2020). In the early years of the colleges of education, successful applicants were interviewed, and a nucleus was selected to pursue post-secondary education. Today, the application process has changed (Kabara, 2020). For example, according to the Vice-Principal (academics) of Abetifi College of Education in the eastern region of Ghana, the sale of application forms is publicized by the Academic Board of the College in consultation with the governing council of the college. In the publication, applicants are directed to where to purchase the forms, when to submit them, as well as the grade requirements for pursuing different programmes.

Nowadays, applicants who purchase these forms proceed to register for admission online (Buchanan, 2020). While the process appears simple, the influence and pressure of protocol admissions, PTA officials, alumni associations and greed by some principals of colleges of Education make it problematic (Babah, Mensah, et al., 2020). Hence, the present computerized admission process starts with sorting applications based on applicants' choices, grades, and college requirements for specific programme (Klarenbeek et al., 2020). Applicants who are not selected for their first-choice programme are put in a pool for second choice selection. However, there are forty-six (46) public education colleges spread across the country (NAB, 2012) each with autonomy in setting admission requirements for specific programme affiliated with universities in Ghana. Normative decision theory at the most general level allows agents to have consistent preferences (or be representable as having) and to select them according to their preferences (Małecka, 2020). The priorities are the admission requirements and restrictions in each academic year that are fed into the system before the admission period. This information includes the minimum grades acceptable by each college for admission and the maximum number of students that can be absorbed by the college (Babah, 2020).

This study describes the computerized selection system used by colleges of education affiliated to University of Cape Coast (UCC) for selective admission of students into their programme. The automated selection system used by colleges of education affiliated to UCC is a multiuser computerized system which students can access and apply to universities at any place with internet access, and can be admitted, rejected, or included in a waiting list for further assessment (Babah, 2020). However, with the positive growth of science and technology, human activities have led to social, ethical

and moral conflicts (Lee & Witz, 2009), sometimes at odds with rational decision-making. Regardless analytical and normative approaches view decision-making as a process (Germeijs & De Boeck, 2003; Kortland, 1996) starting with problem identification, analysis, generation of alternatives, evaluation and, choice, and implementation (Lunenburg, 2010). Thus, the beginning point of this study is to examine the computer selection problem in-depth and determine its features to obtain the best solution (Ozturk & Altan, 2019). Contextually, the research focuses on how admission is made in educational colleges affiliated with the University of Cape Coast, leading to a subsequent generalization of Ghana's forty-six public, academic colleges.

1.2 Statement of the Problem

Organizations are also faced with the problem of choosing a group of systems that function in harmony rather than selecting a particular design for defined and known needs to preserve efficiency in computerized selection systems and allow for scalability and flexibility of computer platforms (Zviran et al., 2016). It is believed that strict adherence to an automated process of admission devoid of any human involvement would ensure efficiency, fairness, reliability, and credibility for the entire process (Ebekozien, Abdul-Aziz, & Jaafar, 2020). Even though the performance of high school graduates is typically beyond a college, as Yeh (2003) found that, the selection process admits students who succeed in their studies. Therefore, student selection is a critical task of college admission steering committees (Ankomah, 2016). There have been several studies conducted on computerized selection system at educational institutions (Grupe & Maples, 1992; Peterson et al., 2010; Peterson et al., 2010; Chapman, Lehmann, Donohue, & Aucott, 2012; Dustan, de Janvry, & Sadoulet, 2017). Few studies have been conducted using college of education. In order to add to literature,

the study sought to investigate the extent to which the computerized selection system at educational colleges affiliated with the Cape Coast University has impacted the efficiency and credibility of the process, by evaluating the step by step stages in admission processes that are handled electronically. The ultimate goal was to determine if the computerized system has led to an overall improvement in the admission process and to make a recommendation to enhance the system.

1.3 Research Objectives

The general purpose of the research was to evaluate the computerized system used in admitting students into public colleges of education, with particular reference to the educational colleges affiliated with the University of Cape Coast.

The specific objectives that was used to achieve the general aim of the research were to:

a) determine the efficiency of the electronic sorting and selection of applications.
b) investigate the reliability of computerized systems for admission into colleges of education affiliated with the University of Cape Coast.
c) determine the challenges in using computerized systems for admission into colleges of education affiliated with the University of Cape Coast.

1.4 Research Questions

To achieve the stated objectives of the study, the research questions were;

a) How efficient has electronic sorting and selection of admission applications been at colleges of education affiliated with the University of Cape Coast?
b) How reliable is the computerized systems for admission into colleges of education affiliated with the University of Cape Coast?

c) What are the challenges in the use of computerized systems for admission into colleges of education affiliated with the University of Cape Coast?

1.5 Significance of the Study

Human culture opposes transition because it fears the unknowability of what the transformation will bring about.(Mutashar & Mousa, 2020). Recurrent resistance to change is manifested in the opinions and ideas that stakeholders communicate and have about the expected change (Allison et al., 2019). This study synthesizes the efficiency and reliability of a computerized selection system for the admission process into colleges of education affiliated to UCC. To improve current information, enhance the automated system functioning and help eradicate opposition to its functioning, ideas that were not captured initially and envisaged in the software development for this solutions and system to human inadequacies associated with manual processes were discussed. This being among the few similar works existing (Babah et al., 2020; Arpitha, 2020; Chapman, Lehmann, Donohue, & Aucott, 2012; Husain & Hidayatullah, 2019; Balellah, Bueney, & Erana, 1995; Marnewick, 2012; Davydova, Kashchena, Staverska, & Chmil, 2020; Muhangi, 2020; Babah et al., 2020; Olawoyin & Eze, 2020; Kabara, 2020) serves as a reference and a rich information source for future studies. This study findings provide knowledge into understanding the workings of the computerized selection system currently in use both to its operators and stakeholders to enhance its administration and functioning. The outcome of this research presented useful information for the Ministry of Education in Ghana, colleges as well as universities whose aim is to provide an easy process of admissions to students.

1.6 Limitations of the Study

The researcher has identified two limitations of the study. First, the researcher could not interview all admission officers, quality assurance officers, and admission registrars in the public colleges of education affiliated to UCC. It is assumed that such a broad scope of coverage would have improved the reliability and general applicability of the findings. Besides, financial constraints that limited travel to perform interviews and solicit responses from stakeholders across the country did not allow the researcher to cover all the public colleges of education. Second, there is a time constraint factor. To perform interviews and distribute questionnaires and follow up later to gather answers from respondents, would take much time to travel the length and breadth of the country. He would not have been able to meet the submission deadline of the completed research work if the researcher was to do all this travel to address these limitations, the researcher identified a case study that had all the relevant variables, studied it extensively, and generalized the findings to other colleges of education. The case study was a college of education affiliated with the University of Cape Coast within proximity of the researcher.

1.7 Organization of the Study

Chapter one is a general introduction including the study background, problem statement, objective, research questions, justification, limitations and scope. Chapter two reviews relevant works of literature on similar topics; these works of literature were evaluated their approaches particularly and critiqued where necessary. The third chapter focuses on methodology, and it is followed in the fourth by data analysis. Chapter five covers the findings, conclusion, and recommendations of the study. There are additional pages, including a sample of the questionnaires as well as the references used in the study.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This study aimed to evaluate the computerised system used by public educational colleges affiliated with the University of Cape Coast (UCC) in student admission. In pursuing this objective, this chapter reviews relevant literature on student admission to provide a theoretical, conceptual, and analytical framework for the study.

2.2 Conceptual Literature Review

2.2.1 Computerised selection system

Computerised selection systems are used by colleges of education in their admission processes including completing and checking application forms for errors and duplications, verification of college requirements, and space availability (Klarenbeek et al., 2020). These processes also include manually producing acceptance documents and preparing and distributing offer-of- admission letters. If students are not admitted to colleges of their choice outright, the process offers them conditional acceptances to other available colleges (Klarenbeek et al., 2020). With the automatic selection, student's record is checked individually to ensure it meets college and programme requirements and when issuing letters of admissions offer student records must be tallied; this speeds up the process and makes it efficient (Ankomah, 2016). Also, since proper record-keeping is essential for future references, all applications are recorded and students classified.

2.2.2 Choosing Schools and Selection programme

Ghana's colleges of education are affiliated with Ghana's universities. Particularly those universities offering education programmes. As part of the reforms in teacher education in the country, the UCC has signed a Memorandum of Understanding with 16 Colleges of Education (Ankomah, 2016). The Memorandum of Understanding (MoU) signals 16 out of the 46 colleges of education to UCC's official affiliations. Similar MoU signal the official affiliation of 6 of the 46 Colleges of Education to the University of Ghana, 6 of the 46 Colleges of Education to the University of Development Studies (UDS), 15 of the 46 Educational Colleges to the University of Education Winneba, and 5 of the 46 Colleges of Education to Kwame Nkrumah University of Science and Technology.

The new Bachelor of Education (B. Ed.) programme has three specialisations namely B. Ed Early Grade Education, B. Ed Primary Education, and the B. Ed Junior High School Education. It is expected that the current B. Ed curriculum will enhance learning outcomes and ensure that children are inspired beyond their time in school to be life-long learners. Prospective applicants are free to select three colleges of education from all the colleges of education in Ghana, where they wish to study using the CSS (Babah et al., 2020). This is because the computer programme would do all the selection and placement of applicants in one area.

Prospective applicants must select one college for one programme only. Thus,

1. First choice – School and programme
2. Second choice – School and programme
3. Third choice – School and programme

2.2.3 Selection programme and school types

Prospective applicants are required to have awaited their results from WAEC and other authorised awarding bodies with credit passes in six (6) subjects before applying (Ankomah, 2016). These subjects include three from core subjects with the core mathematics and English language as compulsory and the other three from elective subjects. Candidates are free to select the colleges of education of their choice but must list the colleges of education of their choice in order of preference, and use the correct course or programme code on the scannable registration (entry) forms. As a precaution, applicants are to ensure that the choice of school offers their preferred programme, and are free to select the same college of education three times as long as they choose different programmes. Similarly, students can select various colleges if their preferred programme are offered by those colleges of education (CSSPS, 2005).

2.2.4 Online admission procedure

Prospective applicants are expected to make a payment to any bank branch, including Consolidated Bank of Ghana, of GHC115.50 into the Colleges of Education-Ghana account. Payments can also be made via a mobile money wallet by dialling the shortcode * 924 * 8 # from all networks: Vodafone Cash, Tigo Cash, MTN Mobile Money, and Airtel Money. Upon payment, the following details will be given to applicants; serial number for the application for admission, personal identification number (PIN), website address for admission-admission.coeportal.edu.gh. Applicants should use this PIN to visit the website for access to Colleges of Education: www.admission.coeportal.edu.gh and follow clear instructions to fill in the online application form.

2.2.5 General concerns about the problem of student selection

The admission of students from senior high school has proven to enhance the programme's objectives (Ankomah, 2016), for example, because it brings unique perspectives that enrich students' experiences of education, the Admissions Committee can recognise the value of a diverse student body. Various backgrounds maybe also in terms of academic records, the rural upbringing of students, ethnic, social, and gender classifications (Marnewick, 2012). The concept of affirmative action as in other countries such as the US, promotes diversity independent of candidate ranking (Sadker & Sadker, 2000). Also, many of the above factors make it more challenging to select students than a classic multi-criteria issue since they violate the freedom of the alternatives that require some initially selected candidates to surrender their position to others far behind in the list (assuming a full pre-order). Thus, for the student selection problem, a multi-criteria approach that can be consistent with the existence of segmentation constraints is required (Mavrotas & Rozakis, 2012). Davey et al. (1994) researched the method of selecting applicants for a doctorate course at universities in the U.S. to strengthen the perception of the process of decision- making. They indicated that in the presence of imprecise or fuzzy knowledge, non-compensatory models that remove the need to challenge the decision-maker with trade-offs between attributes better accommodate imprecision, thus selecting alternatives closer to the intuitive preferences of decision-makers.

2.2.6 Evaluation and Measurement as Placement and Selection Tools

Measurement is the mechanism by which individual members of a group of items or individuals are assigned numbers to denote variations between them (Ebel, 1972). The quantification of attributes is the central theme of measurement; it is also devoid of value judgment. Student test scores reflect the measures of their successes and are thus

the quantification of the success of students (Babah, 2020). These scores help educators make decisions in terms of grouping students or admission according to ability. Evaluation is a concept that has no meaning that is widely accepted (Tamakloe, Amedahe, & Atta, 2005). In addition to test scores, evaluation is often used and includes gathering information on an individual, programme or process to form judgments of value about the efficacy of what is evaluated. Assessment is a method by which quantitative and qualitative data are analysed and obtained to decide on value or effectiveness value which was clarified by Pagne (1997).

The assessment is also used to evaluate the consistency or shortcomings of a programme or system (Sladek, Bond, Frost, & Prior, 2016). There are two types of assessment: a formative assessment and a summative assessment (Baht & Bhat, 2019). Formative assessment is diagnostic and contributes to the evaluation of a programme or method as a whole's strengths and weaknesses (Panchal, 2020). Summative assessment refers to the assessment carried out after an educational programme or course (Groen & Eggen, 2020). It is done after learners have been introduced to the whole content of an instructional time with the programme's defined goals. It is sometimes, thus, referred to as a terminal assessment. The end of the year, term and semester examinations carried out in the various educational settings and institutions (Panchal, 2020) are classic examples of summative evaluation processes.

The West African Senior Secondary School Examination (WASSCE), administered by the West African Examination Council (WAEC), is a form of summative evaluation. To make critical educational decisions, summative or terminal assessment outcomes are used. First of all, the summative assessment outcomes or results are used for credentialing or ranking students on satisfactory programmes and courses completion

(Baht & Bhat, 2019). Typical summative assessment roles in Ghana (Panchal, 2020) are qualification and grading at the end of tertiary, secondary and primary education to attain the award of degrees, certificates, and diplomas. Secondly, the evaluation of summative offers details on admission procedures to educational colleges. For the present analysis, the principles of summative and formative assessment are both critical. The assessments of the productive component of the research require the review of the computerised selection method (CSS) as to whether its success makes it a better alternative to the manual selection and system of placement at the time of the study (Groen & Eggen, 2020). The summative portion of the survey relates to stakeholder evaluation of whether the CSS has accomplished its aims.

2.2.7 In Selected Countries, the school selection and placement system

Academic opportunities and jobs have been highly competitive because high academic credentials, results, accomplishment, and excellence are the basis of selection and placement (Mirza, Hasnain, & Duke, 2018). The persistent increase in the number of students from their respective institutions who aspire to join tertiary institutions is overwhelming. While the number of students entering tertiary institutions rises gradually over time, there is no or little expansion in the infrastructure to accommodate them. Besides, the battle for good and well-resourced schools has created stiff competition between students for admission to them, resulting in excess demand for places in such educational colleges. Some systems of education allow for open entries, i.e., students are admitted to programmes of their choice and tertiary institutions if they qualify for the grade (i.e. the US free admission policy) has been obtained (Grupe & Maples, 1992). In addition to traditional exams, other procedures and requirements for selection systems are introduced by different countries; therefore, in the following

sections, school selection and admission procedures are addressed in some selected countries.

2.2.8 The School Placement and Selection System in Tawain

The only criteria for the placement and selection of students into Senior High School (SHS) from Junior High School (JHS) in Taiwan for forty years, that is, from 1960 to 2000, was to write exam at JHS known as the "Joint Examination" (Lo, 2017). Joint Examination was characterised as a break or make "Examination Hell" since final year students at Junior High School who prepare for the examination go through a hell of endurance and pain (Han, 2009). In the third year, in the final year, a pressure-filled period was what JHS students go through where they attend regular classes every day, after that, they go and spend much time in class and constant homework. Students often study deep into the late hours of the morning in preparation for the joint examination to gain admission into Taiwan first-class (SHS) (Chao, Hsu, Hung, Lin, & Liou, 2012).

Limited result-oriented materials marked it for instruction, unhealthy rivalry and instruction as well as rote methods of learning (Shih, Chern, & Reynold, 2018). A focus of public criticism was the joint test scheme, "the 40-year rite of passage" for young people entering secondary school. It was also noted that the worst part of the mutual evaluation was that only the students who excelled were at the top of the test. The educational authorities of Taiwan and the general public, following critiques of the joint examination, agreed that the joint entrance exam should be eliminated. Before the introduction of the modern methodology called the "multi-track method," however, questions were posed as to whether the joint examination was the "right medicine to solve the age-old problem" (Chao et al., 2012).

The posed question was as to whether, alongside the joint examination, the "stuffed-duck" methods of teaching would vanish. While Taiwan's Ministry of Education (MOE) has been praised for its purpose and plans to eliminate the joint examination that is strenuous, many educators and parents have not been sold in full (Lo, 2017). Despite the shortcomings of the Joint Examination Scheme, many educators and parents were always favoured. Finally, the joint review was replaced and scrapped in 2000 with the "multi-track scheme". The multi-track admission system included access through three specified channels (that is, tracks) to the Vocational Schools or Senior High School (SHS):

1. Track of Recommendations (TR)
2. Track of Application track (TA) and
3. Track of Basic Competency Test (TBC) track.

Multi-track method stressed that in spatial relationships, athletic abilities, intangible factors such as leadership, and musical talent, the student had a special skill and interest. These have been taken into account in the evaluation equation for admission. The joint assessment was replaced (Han, 2009) in addition to the Basic Competency Test (BCT) test scores.

2.2.8.1 The Recommended Track

In the system of multi-track, the heads and authorities of the JHS are required to forward the names of outstanding JHS students to the SHS following the basic competency test that substituted the joint assessment, endorsing them for full admission with the necessary competency test scores of the student and additional criteria such as achievement in science and interview success.

2.2.8.2 The Application Track

The second track is the Application Track in the multi-track system. It included a bid for admission by students seeking access to Senior High School. Therefore, the Application Track requires the student of his/her choice to apply to SHS without the recommendation of the Junior High School from which she/he attended (Han, 2009). Non-academic in-school skills, such as exceptional ability and leadership, are factored in the assessment calculation with the necessary competency track scores for admission purposes.

2.2.8.3 The Basic Competency Track (BCT)

BCT scores and nothing else were strictly the third platform or avenue from which graduates of JHS in Taiwan can be admitted to the SHS on the Basic Competency Track. In addition to the BCT ratings, SHS in their admission evaluation equation does not use the JHS scores of the applicant (Han, 2009). The SHSs are required to reserve 50 per cent enrolment vacancies for BCT track candidates, based on a multi-track policy on admission to Taiwan's SHS. In March and June, the BCT study is conducted twice a year. Candidates who were unable to be admitted by recommendation to the SHS or who were not pleased with the options available after the March placement and selection were permitted in June to have a second shot at the BCT to encourage them to join the SHS based on the BCT track (Lo, 2017). However, despite the acceptance and benefit of the multi-track, there were still reservations about the multi-track. Multi-track system critics have found that learners from a well-to-do background profit more from the new system. Another critique of the multi-track was that it acted as a shortcut for the rich to the best colleges.

The inclusion of other variables in the evaluation equation of admission was an additional issue associated with the new method (multi-track). Different factors include proof of science project fairs and piano ability. Musical ability, drawing, creative and athletic pursuit are another group of variables included in the equation of evaluation (Shih et al., 2018). Parents must pay extra money to allow their wards to acquire these talents at an increased rate, as students have to enrol in the "cram schools" that have flourished since the abolition of the joint examination system and have offered these programmes. The assumption was that the cultivation of additional talent included in the equation of evaluation had to do with parents' socio-economic status in society, but had little to do with the student's interest and innate skills.

On this basis, it was reported that the joint evaluation was fairer than the multi-track review in its placement procedures. Finally, the multi-track was structured to change the system but ignored Taiwan's principles (Chao et al., 2012). In support of the Taiwan MOE's new system authorities, the design of multi-track argued that there were 20 per cent more vacancies than JHS graduates in the Vocational Schools and SHS. As a result, there was no lack of schools to attend. Instead, the strain on learners comes from parents who want their children to attend "first-class star schools" on the presumption that money and achievement are followed by diplomas from these institutions (Han, 2009).

The Taiwan MOE noted that the ratio of students who opted for "college-bound" secondary schools to those who opted for education for a vocation has remained stagnant at 39:61 since the 1970s, while there was a steady demand for college-educated professionals as a result of changing economic conditions. Vocational programmes are geared towards the development of advanced and career-oriented skills, which means

that students prefer vocational education to mere grammar-oriented schools (Shih et al., 2018). In an effort by the MOE to see closing this gap as an urgent task in the educational reform process, they stated that "the elimination of the Joint Examination System in favour of the multi-track system is futile without additional steps." To supplement the multi-track scheme, a group "system under which students would attend schools located near their homes to study in a less competitive atmosphere" was motivated and proposed instead of attending "star schools" where other considerations, like athletic ability, musical, and science fair results, are included in the peer review equation (Chao et al., 2012).

2.2.9 Placement and Selection of Students at an institution of higher education in Turkey

Variety of historical changes from the pre-1950s to the present have been seen in the placement and selection of students at an institution of higher education in Turkey (Kirkiç, 2019). Trends are being reviewed on an era-based basis.

2.2.9.1 Before the 1950s

The choice of applicants for higher education programmes was not viewed as an issue before the 1950s (Kitchen, Bethell, Fordham, Henderson, & Li, 2019). The selection requirements are based on the graduation test carried out under the auspices of the National Education Ministry by individual high schools, and the enrolment examination carried out (Kitchen et al., 2019). The grade of the enrolment test was used as the sole criterion for selection when the number of applicants required exceeded the number of vacancies.

2.2.9.2 The 1950s

The rapid growth of the student population before 1950 made the procedures for placement and selection of students insufficient from 1950 onwards (Kitchen et al., 2019). Specific higher institutions have also implemented their autonomous choice and placement procedures for students. The methods were found to be unsuitable because they were essay test items of subjective that were impossible to test objectively. Less personal, objective tests for selection and placement were gradually adopted. Fair access to higher education could not be accomplished through autonomous selection activities by higher education institutions when quantitative criteria were introduced (Kirkiç, 2019).

2.2.9.3 The 1960s

The Inter-University Board created the Commission for the Inter-University Entrance Examination in 1963 (Kitchen et al., 2019). The Commission was tasked with finding a viable method to expand the placement and selection of candidates, hence the implementation of the Inter-university Registration and Entrance Examination (IREE), ratified by the Inter-university Board in December 1963. A standardised scheme for admission of students to higher education institutions began in the 1964-65 academic year. For the first two years of the consolidated structure, the entrance exams were conducted and prepared by Ankara University, by Istanbul University from 1966 to 1973, then by Hacettepe University in 1974. The scores of the entrance exam were used for the placement and selection of students into higher education institutions (Yamamoto, 2006).

2.2.9.4 The Early 1970s

In the 1974-75 academic year, a central placement method developed by University of Hacettepe was introduced after the central selection test. To establish a greater degree of uniformity and consistency in the administration of the entrance exam, the Inter-university Student Placement and Selection Centre was created by the Inter-university Board in 1974 (Gök, 2016). According to the Higher Education Legislation that went into force in 1981, the Centre was linked to the student selection and placement centre.

2.2.9.5 The Mid 1970s -1980s

The essential features of the 1974-80 (OSYM) administered feedback evaluation are summarised as follows; a battery of four-test was used, including a social science and literature test, a general skill test, a natural science and mathematics test, a foreign language test, and a language test of Turkey (Kitchen et al., 2019). The tests were administered in a single section to all the testing centres at the same time and day. The test ratings have been translated into standard scores. Four types of composite scores were determined using the expected scores to appeal to foreign languages, social sciences, natural and social sciences, and natural sciences (Grant, 1990). As a result, the applicants were put based on their cumulative ratings, the Student College preferences list and the places available in the higher education programme chosen.

The applicant submitted full application forms before the central examination, in which 18 education programmes were listed per their personal preferences. The number was increased to 30 in 1975 and reduced to 20 in 1976. Substantial and significant improvements were made in the process of student placement and selection in 1981, with the implementation of a two-stage test, where grade point average of applicants in

high school was taken into account in estimating the composite scores (Yamamoto, 2006). Around 1981 and 1988, the placement and selection system for students was identical to the current system. The only recognisable distinction was that there were two steps in the system for 1981-88: the Second stage Student Placement Examination (OYS) and the Student Selection Test (OSS), which took place about two months after the first stage. Owing to the high similarity between the two placement examination (OSS & OYS), the Higher Education Council requested that the two exams be merged into one in 1999; that is, the OYS was discontinued (Kitchen et al., 2019).

2.2.9.6 The 1999 - 2005 Period

The fundamental characteristics of the Student Placement and Selection System (OSYS) for undergraduate programmes were that a centrally controlled examination system was used to pick and position students; the OSS was the basis of the system, and its organisation was carried out by the Student Placement and Selection Centre (OSYM), which was associated with the Higher Education Centre. The demand for higher education in Turkey, as in most other countries, greatly exceeds the places available (Kitchen et al., 2019). For this reason, the OSS was designed to arrive at two goals, notably:

1. Maintaining a balance between the available places in higher educational institutions and the need for higher education.
2. The student selection and placement process starting now referred to as Student Selection Test was designed to attain these two fundamental gains equally and economically to meet the required deadlines to position and select students in all available higher education programmes with the highest likelihood of success, taking into account their performance and preferences at the (OSS) (Kitchen et al., 2019).

2.2.9.7 The Student Selection Examination's (OSS) basic structure and concepts

1. Turkey's Higher education is essentially undertaken at the tertiary institutions, and the OSS must be taken as a full or partial requirement for placement by those wishing to participate in either four or more undergraduate programmes (Kitchen et al., 2019).
2. In the Higher Education Act, the critical OSS rules are set out. The Higher Education Council (YOK) decides its details based on the OSYM's recommendations. The role of the centre and the legal status are also specified in the same legislation.
3. Each year, details of other relevant information for candidates and the OSS are given in two booklets approved by YOK and published by the Centre. The handouts constitute the legally binding rules and regulations of the system, which are referred to as OSYS guides (Grant, 1990).
4. Three critical aspects of OSS exist:
    a. Procedure of application
    b. The Examination.
    c. Assessment of the outcomes and the placement of the chosen candidates in the undergraduate programmes.
5. The examination is made up of:
    a. The OSS (The Student Examination)
    b. Examination for a foreign language (YDS). About a week after the first applicants who plan to attend foreign language and literature higher education programmes, the YDS is administered (Gök, 2016).

2.2.10 Kenya's Student Selection and Placement System

Kenya has adopted the 8-4-4 educational method. This requires 4 years of university education, 4 years of high school and 8 years of primary school (Muigai, 2014). This arrangement was expected to allow school drop outs to get work at all levels in the informal sector or to be self-employed. In January 2003, free primary education was integrated into the system of education. As a consequence, primary school enrolment rose by 70 per cent. However, tertiary and secondary enrolment did not increase proportionally due to fee-paying at these stages. In Kenya, the Kenya Certificate of Primary Examination (K.C.P.E) is written in class eight (8) of primary school (Glennerster, Kremer, Mbiti, & Takavarasha, 2011). For placement at the secondary stage, the findings of this test are used. The K.C.S.E is written in categories of eight subject in the fourth form of secondary school. The average grade is dependent on results in eight subjects. The average grade is based on the KCSE's best eight subjects when a student sits for more than eight subjects (Glennerster et al., 2011).

University selection and placement for admission are based on the success of eight best subjects in the unique issues that apply to the degree course selected by the student. The process for choosing training institutions and universities are based on the student's ranking. Grade B+ students use to enter one of the public universities in Kenya, which also determines their minimum qualifications for entry (Glennerster et al., 2011). Grade C+ students qualify for a University degree course, but before considering those with grade C+, students with grade B, B- and above are taken for Public University degree courses due to rivalry and fewer places at the Universities. Middle colleges or private universities join the rest.

2.2.11 School selection and placement procedures in Tobago and Trinidad

There is a 7-5-3 system of school for Tobago and Trinidad that is 7(seven) years of primary, 5(five) years of secondary, and 3(three) years of tertiary (De-Lisle, 2019). A high emphasis on education is placed by the country and thus has a population that is almost universally literate. (Statistical Central Office, 1987). Depending on whether a student wishes to try 'A' levels or not, the 7-5-3 scheme involves 7-5-5 or 7-5-4 time-table combinations. Before entering primary school, most kids are admitted to pre-school for two years. At public primary, secondary and tertiary schools, there is also free tuition (Cumberbatch, 2020). A Secondary Entrance Assessments Examination (S.E.A.E.) is written before the selection and placement in the open public primary and secondary school system is achieved. The Government of Trinidad and Tobago initiated the "Placement for every student" programme in 2001. In secondary schools, all students who write the S.E.A. Test are also automatically placed (That is an open enrolment) (Lisle & McMillan-Solomon, 2017).

Denominational boards oversee the more popular secondary schools, though most schools are well endowed and fitted (Cumberbatch, 2020). Students are tested in selected subject areas after five years of high school, with English and Mathematics being obligatory. In addition to English and Mathematics, students are only expected to demonstrate their success in three other subjects with this system to qualify to receive a Certificate of Ordinary Level Secondary Education (C.O.L.S.E). After that, to obtain an advanced level of education may or may not be the option for students. In the Caribbean Islands, Tobago and Trinidad joined their counterparts to endorse Caribbean Advanced Proficiency Exams (C.A.P.E), which replaced Cambridge Advanced levels in 2004 (De-Lisle, 2019). Students who pass this exam will apply for enrolment at the

University of West Indies (UWI) using one of two choices. For five subjects, choice A includes passes, of which C.A.P.E or GCE must be part. Choice B is suitable for those with a G.P.A of 2.5 and above before they will be suitable for an associate degree from an approved Caribbean university. Competition is always stiff and keen for admission into schools such as Medical Sciences and Engineering; thus, students are chosen based on the "Best Scores First" (that is on merit) theory (Lisle & McMillan-Solomon, 2017).

2.2.12 Selection and Placement Method of Schools in the USA

The door to an economic and career opportunity is a high level attainment at a high-quality school in the United States (Babah et al., 2020). In terms of qualifications, diplomas, and degrees, a high standard of educational achievement often means credentials, a sort of approval for academic seal in the society of America. However, the high achievement of education is easily accessible to specific individuals in the United States. Hearns (1984) noted that creamy whites tend to climb to the top of the education system amid the American idea of equal educational opportunities, whereas disadvantaged students tend to fall to the bottom. This is as a result of the "Tracking" method practised in American public schools. It is expected that some form of monitoring is used by about 80 per cent of secondary schools and 60 per cent of elementary schools in the USA (Hallinan, 1997; Sadker & Sadker 2000). Tracking is the method used to select and position students in specific curriculum classes based on test scores and variables and other factors such as ethnicity, gender, and parents' social status.

Mensh & Mensh (1991) noted that the success of intelligence (IQ) exam students is one of the most common criteria used for allocating tracks. Sadker & Sadker (2000) defined tracking as a method of placing students into homogeneous classes or learning

experiences according to their skill level. According to their academic abilities and perceived interests, students are grouped, selected, and put in course programmes by monitoring. The "tracks" of courses and programmes (that is, technical, general college-bound, and vocational) are assigned to students of various abilities (which are low, middle, and high). Thus, the groups or classes become homogeneous learning experience groups. It will not be easy to climb up from one track to another once a student is put in a specific class (Babah et al., 2020). By monitoring, the low status and low-quality courses are channelled through many Native Americans, Hispanics, and low-income blacks. The reason and justification for the monitoring process are that, as determined by test scores and teacher opinions, Native Americans, Hispanics, and Blacks have the less academic ability. Another big part of the monitoring reasoning is that inhomogeneous communities where everyone has the same level of knowledge or the same learning difficulties, students learn better (Babah et al., 2020). Also, many individuals assume that working together in homogeneous classes is better for students with intellectual abilities and similar skills. Following this assumption, educators sort, screen and direct students into courses based on their abilities and thus send them down various school paths to deeply form their future.

Recent research indicates that only top performance students' scale is advantageous to homogeneous classes (Gamoran & Nestrad, 1990; Robinson, 1990). With better and sometimes more money, smaller management classes, and more inspiring teachers, the few lucky students in the highest hierarchy benefit from a more engaging classroom setting. A study conducted by Oakes (1990) in mathematics and science found that lower-track students appear to get fewer trained teachers and less attractive teaching methods, learning materials, and more inadequate quality books. This gives students little chance, if any, of taking the courses needed for training on the lower tracks. The

benefits in higher ways for lucky students; however, do not outweigh the harm done to students assigned to less complicated programmes by tracking; therefore, tracking provides no net advantage of education. However, in choosing and putting American students in public schools, it continues to be commonly used. Many educators agree that monitoring makes teaching manageable, whereas others think it is a flawed device (Babah et al., 2020). In American schools, monitoring is probably the most significant barrier to equal opportunity. As a result of issues associated with IQ tests, the use of IQ tests for monitoring has many significant disadvantages. First, only a limited range of mental abilities, primarily mathematical and verbal skills, are tested by IQ tests. They measure little or none of the imagination, versatility, insights, ability to learn from context or abilities of a person to communicate with individuals. It is not surprising, considering these limitations that IQ scores do not correlate strongly with progress in life (Winn, 1985). Also, IQ assessments are biased against students of such experiences and backgrounds (Neil & Medina, 1989).

In addition to the monitoring method in the U.S.A, when the number of applicants exceeds the available spaces, the individual American States and Chartered schools use the lottery system for selection and placement in senior high schools (Babah et al., 2020). In several nations around the world, monitoring and unequal access to higher education are evident. The educational system in Japan needs equity in school funding and demands that all students use the same textbooks. "However, only the more wealthy Japanese can afford to send their children to the schools of" juku "or" Cram. These afternoon schools prepare students from high school for exams deciding admission to prestigious colleges (Efron, 1997).

2.2.13 Yugoslavia's School Selection and Placement System

Olave, Rajkovic & Bohanec (1989) describe that expert computer application systems are used in Yugoslavia to pick and position kids in a nursery school in the region of Ljubljana. Excess demand for places in nursery schools was what contributed to selection and placement. The issue of choosing 300 out of the over 600 applications submitted has always been faced by Ljubljana and the inability of school acceptance/admission committees to justify satisfactorily to parents why their wards were not chosen. A project was initiated by the school authorities to design, create, test and introduce a methodology to solve the problem of selection and placement that would assist the selection committee and, ultimately, the school authorities in their acceptance procedures, using a computer-based decision-making support system. (Bohanec & Rajkovic, 1987). DECMAK (Bohanec & Rajkovic, 1987) was the critical method used in the development of the decision support system to rate nursery school applications. This is a multi-attribute decision-making expert system shell; that is a system of computer programmes that allow the decision-maker to cope with multi-decision making. The method assesses, classifies and ranks applications and has been successfully implemented in around 30 realistic situations of decision-making, such as;

1. Computer systems review for companies
2. Range of school hardware and software for computers
3. Selection of Trading Partner
4. Feasibility assessment of a project
5. Selection of applicants for a position listed
6. Public enterprise efficiency appraisal

The technique for the selection of expert systems performed well and was therefore supported, accepted and recommended to the higher authorities of the city of Ljubljana and the Republic of Slovenia, where it was implemented on a broader scale. It was noted that a reduction in the reliance on subjective assessments characterised the exact processing technique. It also streamlined the function of the admission committee, reduced deliberation time and allowed the committee to clarify without uncertainty the outcomes of the admission process. Eventually, it was noticed that the amount of work was decreased and the accuracy of decisions was higher. With that, there was a decline in the number of disputes between parents and nursery school authorities.

2.2.14 Guyana's School Selection and Placement System

Bacchus (1966) clarified that in Guyana, all four primary pupils take the Secondary School Entrance Examination (SSEE) to assess their placement in secondary schools. The rational for this is the absence of appropriate places to accommodate all children leaving primary school in public secondary schools. Children were offered positions based on results at SSEE and parental choice at:

1. A Secondary General
2. Community High
3. The Primary School's Secondary Department

The SSEE was phased out as a pure placement method as Guyana shifted to a Universal Secondary Education (USE) role. In 1963, the insufficient number of high schools persuaded UNESCO to suggest that primary schools be restructured to create a department of "High School" up to Form 3 (UNESCO Report, 1963). The suggestion was adopted, and "all-age" schools became known as primary schools. In the SDPS and

community schools, students who did not make it into the "General High School Placement" were put. The tradition still exists and constitutes this procedure. Selection for secondary school placement is not dependent on success per se, but the number of available places and school preferences. The Ministry of Education (MOE) of Guyana stipulated that the number of sites available for selection and placement in public secondary schools should be dependent on the number of places available and that an evaluation criterion based on SSEE level scores should be applied to achieve the allocation. The standards have an exact academic aspect that is evidenced in the portion to top elite secondary schools of students with the highest scores. Bacchus studied the SSEE selection, and placement method (1966) and a relationship between parents' socio-economic status (SES) and student success at the SSEE was developed. He pointed out that, relative to those whose parents had a low socio-economic status, students whose parents had a high socio-economic status performed well at the SSEE level. This pattern means that children of parents with high socio-economic status attend comparatively more high numbers of senior and junior secondary schools than students of parents with low socio-economic status.

Therefore, the SSEE was determined to recognise only the appearance and not the latent skill of students, resulting in many being improperly put. It was also decided that the selection and placement of the SSEE improved society's class system by allocating students to different styles and grades of schools based on the socio-economic status of the parents. They were using influential academics as an additional criterion in student placement and the classification of schools as academic and non-academic, this issue was exacerbated. Bacchus (1966) argued that one secondary school system would not produce class distinctions and enhance, but would counteract, the class structure. He

further noted that the use of the availability of placement vacancies as a criterion for the allocation of secondary school students concealed the class policy of choosing students for the different types of schools. In conclusion, he noted that high achievements were favoured by the early selection process and the stratified high school system, operating to the detriment of students who were put at the lower end of secondary education.

2.3 Theoretical Basis of the Study

2.3.1 Normative Decision Theory

The decision-making problem regarding student admission into colleges of education requires a solution with more than one alternative (Svenson, 1996). Examining the literature, there are different approaches directed at explaining decision-making processes for admission into colleges of education and coming up with solutions (e.g., Lipshitz, Klein, Orasanu & Salas, 2001; Ratcliffe, 1997). One approach considers decision-making as normative, analytical, or summative. Normative decision-making focuses on how the decisions should be made (how they ought to be done) instead of how they are made (Hansson, 2005; Jonassen, 2012; Ratcliffe, 1997). By this approach, the psychological processes that affect decision making are ignored to focus on the process to make the best decision (Hong & Chang, 2004). A second approach considers it as holistic focusing on intuitive and psychological processes and how decisions are made (Ozturk & Altan, 2019). According to this latter theory, past experiences of people or other psychological factors influence decision-making. Adding to these approaches, Hogarth (2005) explains decision-making processes through two different cognitive systems, being intuitive and analytical. While defining intuitive decision-making systems as unconscious and influenced by emotions, he points out that the

analytical system requires consciousness and logical justification which are also echoed by Ozturk & Altan (2019).

Regardless of which approach is used, admission processes are affected by decision-making processes and admission requirements of colleges (Fang, Hsu & Lin, 2018). However, when the admission process is structured to require analytical decision-making, individuals tend to make analytical decisions even though the intuitive system affects the decision-making mechanism. It is possible to understand the reasons behind individuals' judgments about the admission processes through the theories noted above (Wu & Tsai, 2007; 2011). For example, normative decision-making allows dealing with decision-making as a process (Germeijs & De Boeck, 2003; Kortland, 1996) that starts with problem definition (Lunenburg, 2010). At this step, it is necessary to examine the problem in-depth and determine its features to obtain the best solution. Then, in the next step goals and their measures (criteria) are determined to guide the development and evaluation of alternatives to solve the problem. The in-depth analysis at this step and how well each choice meets the goals in terms of the values of their measures collectively provide evaluation results to guide decision making. That is, the alternatives are evaluated using the criteria determined in the first step and a computerised selection system to guide decisions on the admission of candidates into selected colleges (Kortland, 1996; Ratcliffe, 1997). Sometimes, none of the alternatives may meet all the criteria at acceptable levels (Baker et al., 2001) leading to the choice of other techniques such as satisficing (meeting acceptable levels of measures) to guide decision making. Despite this potential problem, the benefit of the normative approach in terms of rational decision making makes it the preferred method in this study. This is important to conduct an in-depth analysis beyond determining what is effective in

the decision-making procedure of admitting students into colleges of education. Therefore, in this study, an evaluation is made within the scope of normative decision-making theory to examine decisions about the computer selection system for the admission of candidates into colleges of education.

2.3.2 Institutional Theory

To that end, this paper highlights the potential for Institutional Theory (IT) to provide an in-depth understanding of the processes of transition associated with the adoption and implementation by the education service in Ghana of the computerised selection method for students in colleges. We illustrate the possibilities of research resulting from integrating computerised selection systems with college admissions. This leads us to suggest an agenda (Guerreiro, Rodrigues, & Craig, 2020) for future study. Such institutional processes are discussed in this study, and we discuss in this introductory article how perspectives from institutional theory relate to our understanding of such fundamental changes. Instead, the institutional theory focuses on the macro stage, analysing the roles and actions of interdependent actors in institutional contexts (Wijk, Zietsma, Dorado, Bakker, & Martí, 2019), and seriously considering the notion that laws, norms, and values are collectively constituted, negotiated orders, which can be renegotiated to promote social innovations (Wijk et al., 2019). The proponents of the theory subsequently gave a broader account of performativity, including the role of the computerised selection method on students' successful admission to the college of education (Beunza, 2019). Institutional theory has been primarily introduced at the level of education (Bashir, 2019) may be relevant at an individual level as well.

2.4 Hypothesis Testing

Out of the literature reviewed, the following hypothesis will be analysed to support the study;

H1: *There is a relationship between the efficiency of electronic sorting and selection of admission applications and the reliability of the computerised system,*

H2: *There is a relationship between challenges of using a computerised system for admission and its' reliability,*

H3: *There is a relationship between the challenges of using a computerised system for admission and its' efficiency*

2.5 Empirical Review

Relevant school selection and placement procedures are discussed in the empirical analysis. The placement and selection processes of students in academic programmes and schools in educational institutions and systems are assessed and evaluated by having students write a typical and normal end-of-programme of course test. For instance, to apply for admission to the college of education, the WASSCE results are used (Koomson, Brown & Edjah, 2006; Addai-Mensah, Djangmah, & Agbenyega, 1993), the evaluated education system of Ghana in terms of the socio-economic consequences of general education, senior high and primary education in particular, and the Traditional Entrance Examination (CEE) process of selecting primary school students into secondary school. They noted that in Ghana, as in many other developed and developing societies, education has been a significant factor in deciding the future socio-economic status of a child. A good education almost consistently ensures an individual of a place in the "comfortable middle class" newly emerging. A successful senior high education has been shown to provide one with the ability to progress to the university, thus a lucrative career.

Instead, vocational and technical education, which accommodates a smaller proportion of students, does not give rise to any lucrative jobs in Ghana, nor has Ghana's socio-economic development been given its true meaning. The study further revealed that there are equal opportunities for all children concerning primary education. However, free and compulsory primary education has brought many problems in its wake, particularly disproportionate numbers of students trying to be admitted into senior high school. Also, it was noted that while primary schools availability is sufficiently wide to take up any school-going child, places in senior high school are small as only 5% primary school children can ultimately be admitted to senior high school. Since a successful and sound senior high education offers students the chance to progress to the university, the senior high school selection test is also possible. In the life of any Ghanaian boy, the CEE has become very important (Addae-Mensah et al., 1973).

Likewise, Foster (1965) observed that senior high school education tends to be the most important thing in Ghana's entire education system. Addae-Mensah et al. (1973) studied the demerits and merits of the "Great Examination," the CEE, which, on a chosen day in March each year, decides the fate of most Ghanaian school kids from 8 am to 1 pm. With the high degree of selectivity associated with the Traditional Entrance Test was the topic of much public discussion, so some educators proposed compulsory secondary education for all students. On this basis, a long-term strategy was introduced by the Education Reform Committee (that is, the Kwapong Committee) to decrease the length of school course studied at the basic elementary to six years and to develop existing middle schools where pupils who are not admitted to secondary school will go. Both pupils and parents in Ghana are aware of the wide difference in general facilities and teaching between senior high schools and basic schools; hence, their choice of attending senior high and basic school is well educated.

Foster (1965) claimed that pupils in senior high school are professionally and academically focused and do not go to school for their pleasure or comfort. He found that 76.7 per cent of schools were selected in a sample of 775 senior high schools at the Common Entrance with the results of the selected school exam at the Ghana Certificate Examination (GCE). Therefore, most guardians choose to send their children to the old endowed, and well-established schools whose pass rates at the GCE are above 60 per cent with the average national pass rate of 42 per cent. In tandem with the strong competition for admission into senior high school, the highly selective character of the Standard Entrance Test has made rivalry for high degree schools far more extreme than the national average. Unintentionally, the Traditional Admission Test leads to the development of two school classes; the preparatory or international special private and public schools. To enter a first-class school, a pupil in a public school must be exceedingly bright. Many parents are deprived of many important needs and sacrifices as an outcome of rivalry for restricted places in senior high schools to send their children to schools that are private and will make them qualified to pass the CEE. It was found that one dealt with "two culturally distinct" classes of students, namely public schools and private schools, at the Popular Entrance Examination level. These classes of students, however, were not substantially different from each other.

Addae-Mensah, et al. (1973) assumed that every selection process must fulfil the requirement that all classes' potential capacity is evaluated equally, thus mitigating the impact of other factors, like candidates' socio-economic history. They noted that the key criteria used in the application in most colleges are the scores obtained during the CEE. However, the findings of Addae-Mensah, et al. (1973) cast serious doubts about the explicit validity using the CEE scores in the selection of high school students due

to the use of raw scores favouring students from preparatory schools. Study results of the first 20 applicants getting admission into endowed senior high schools based on raw scores from the CEE confirmed their observation. The research examined the success of the top twenty students admitted to the Cape Coast College of St. Augustine in 1972. Eleven (11) of the twenty (20) students came from preparatory schools, while 9 came from public schools.

Provided that the results of the CEE were a reliable selection method, it is predicted that by the close of the first year of high school, around the same proportion of students would be among the top twenty (20) students. At the end of the first year of high school, however, there were just 6 out of 11 students from private schools, compared to 13 from public schools. Of the 6 students in the top 20 from private schools, only 4 were in the original top twenty (20) at the Common Entrance Examination stage, while 8/9 from public schools were from the Common Entrance Examination in the original twenty (20). For the other top schools reviewed, this outcome holds strongly. Prempeh College and Achimota College are amongst them. Therefore, this indicates that the CEE has overemphasised the abilities of private school students and underestimated the abilities of public school students; therefore, it is not a legitimate selection instrument or mechanism for placing and selecting senior high school students. Addae-Mensah, et al. (1973) proposed that the raw CEE scores should be normalised using suitable statistical methods for both private and public school applicants. Frequency distributions and percentile standards have been shown to provide good methods for comparing the outcomes (that is, scores) of the two diverse classes taking the same test (CEE) (private and public schools).

A useful tool or method of checking and enhancing the validity of the test selection process may be those criteria graphically achieved by the use of Ogives. Correction factors can be worked out using Ogives to balance out the gaps between the two classes. Based on corrected variables, forecasts can then be made. For example, a mark of two hundred and fifteen scored by a student at the public school would be equal to 224 marks scored by a student at the private school at the tenth (10th) percentile. Such a technique to upgrade the public-school students' scores would give the two classes approximately, equal opportunity of getting their choice of senior high schools. From the debate, it is evident that Addae-Mensah, et al. (1973) showed the invalidity and unreliability of the CEE as a method for choosing students in Ghana's senior high schools, noting that the CEE overestimated the potential of students in private schools while underestimating the capacity of learners in private schools. They acknowledged that it would be technically impossible to set up a "culturally free" test to address the problem of discrepancies between public and private schools. Therefore, in terms of the use of Ogives or percentiles, they proposed a statistical method that would help enhance the selection process based on the results of the CEE. In Ghana, Ajayi (2009) did empirical work on the method of placement and selection. To explore school choice, student selection and placement, he employed a specific dataset on the education system of Ghana.

He noted that entry into Senior High Schools (SHS) for Junior High School (JHS) students is based on the ranking of their three school choices by students and their success in the Basic Education Certificate Examinations (BECE). To investigate how preferences differ with student characteristics, he used a demand model of schooling and students ranking from their selected schools. He discovered that an applicant would rank schools of preference based on admission and selection probability, while naive

students would make their choice based solely on popularity and preference in school. He also noted that educational qualifications are closely associated with employment results, making it more likely for employees who complete the West African Senior School Certificate Exams (WASSCE) at the end of Senior High School to work in the formal private sector and public sector where there are job security and higher salaries. The inability to progress to the senior high school may therefore have major consequences for future welfare (the qualification of Ajayi for education and job effects). In September 2005, Ghana introduced a Computerized School Selection and Placement System (CSSPS) to increase accountability and boost the quality of the process of school transfer.

Before this, school admissions and student selection were manually carried out at the head teachers' annual meeting in each region following the declaration of exam results; students were expected to select three schools from one region to minimise the burden on an administrative school assignment. Furthermore, student placement cards were misplaced, and parents regularly argued that school assignment was based on preferential treatment and not on merit because well-connected students were admitted to the top and well-endowed schools even though they did not have the necessary grades. Therefore, the computerisation process was designed to resolve some of the limitations inherent in the manual method. Students may choose schools from various regions under the CSSPS, and there is minimal intervention from headmasters in the selection and assignment process for schools. The CSSPS uses a delayed acceptance algorithm for a school assignment (Gale & Shapley, 1962). Under this algorithm students are ranked according to their priority levels (that is test scores in the case of the CSSPS); they are then proposed as a match to their first-choice school in order of

their test score rankings. Students are allocated to their first preference if there is a room available.

If the student is unassigned in the first round, then the second-choice school is considered, and the process repeats. In the second round, if the first-round student has a lower examination score, students can displace a student who was assigned in the first round. There is no penalty for ranking schools in an arbitrary order within the set of the three first-choice schools under this algorithm. This contrasts with the Boston mechanism which does not allow already allocated or positioned students to be displaced in subsequent rounds. There are therefore strong rewards for making a strategic first option under the Boston mechanism, which does not exist under the deferred acceptance algorithm. Students who are not placed or assigned to any of their chosen schools are assigned to any space available or whenever possible in their district. However, if there are no spaces or vacancies left, students who receive a passing grade may not be assigned to any school at all. Students are told of their placement and are given thirty (30) days to register at their schools of placement once the school year starts, Heads of SHS are then expected to report any unfilled places to the Ministry of Education so that the spaces can be allocated to previously unassigned students.

Ajayi (2009) revealed that there is imperfect compliance with this regulation, and anecdote evidence indicates that some schools under-report the availability of spaces to reserve those which they then assign at their discretion. As a result of Ajayi's disclosure in the 2009 school placement exercise, to eliminate this issue, many schools were assigned more students than the declared places. During the current school assignment method, the CSSPS makes ample effort to counter socio-economic disparity. Several

schools were assessed and given a deprivation score arranging from 0 (not deprived) to 9 (highly- deprived). To compensate for the disadvantages of attending under-resourced schools, especially in rural areas, these scores are used to scale up the test scores for students from low-resourced junior high schools (JHS) and rural schools. It should be noted that successive attempts to improve the selection and placement process in SHSs are aimed at improving productivity and increasing access to second-cycle institutions, as there is often excess demand for placement over established secondary school vacancies. This condition is compounded by Ghana's annual rise in the number of JHSs. A similar increase follows the rise in the number of JHSs in JHS enrolment. There is, however, no big increase in the number of SHSs.

The number only increased, and stagnated, from 492 in 2005/06 to 700 in 2006/07. In Table 6, evidence also shows that location fluctuates in SHSs. That is, the number was 384,455 in the 2005/06 academic year. This rose in 2006/07 to 485,742, but in 2007/08 it fell to 454,681. In the Greater Accra Region of Ghana, Babah, Frimpong, Mensah and Sakyi-darko (2020) studied Computerized School Selection and Placement System: Perception of Stakeholders and found that with the development of the CSSPS, enrolment in the least endowed schools did not increase significantly. By nominally increasing their enrolment, the CSSPS favoured rural schools. This is representative of the view held by 63.37 per cent of respondents. Limiting preferential care to less eligible applicants from Heads of Senior High Schools helped boost enrolment in rural schools as brilliant rural students with low scores have to stay in rural schools. Eventually, the merit-based deferred placement nature of the CSSPS placed low-score students in rural schools to boost their enrolment nominally. The CSSPS substantially reduced the placement delay phenomenon; this statement was supported by 75 per cent, 77.4 per cent, and 80 per cent of parents, SHS Heads, and GES / MOE employees.

In their schools of choice, the CSSPS was able to position about 80.6 per cent of eligible students, while the remaining qualified students were placed in schools where vacancies occurred during the first round of placement regarding their overall scores, districts and regions of choice. As one of the key players in the CSSPS programme, parents proposed the discontinuation of the CSSPS. In particular, for two key reasons: the difficulty of replacing missing cards and names and the difficulty of accessing placement in endowed schools among rural students. 73.5 per cent of the reasons given for such an action amounted to both reasons. The issues of corruption and the manipulation of the CSSPS by government officials were discussed by the heads of SHS and GES / MOE staff and given rich reasons for discontinuing the activity of the CSSPS. Stakeholders decided that the CSSPS, therefore, offers a better method for selecting and putting students in SHSs with the true image of student success and makes selection simple as well. The continuation of the CSSPS was endorsed by parents, based on the belief that it reduced corruption and removed unfair treatment and favouritism.

With the development of the CSSPS, pressure on the selection of endowed schools was not reduced. Challenges to the CSSPS were divided into two classes, namely structural mistakes and individual variables. Systemic errors relate to human fallibility, while the difficulty of the human element relates to human behaviour, i.e. the reluctance of parents and their wards to consider placement in less endowed schools and any other school than those originally chosen for placement. As the major challenge to the CSSPS, the human element was established. The CSSPS greatly reduced the human errors that characterised the manual system of selection and placement of eligible students in SHSs, but the human element continues to be the key challenge to the smooth operation of the CSSPS. There was agreement that the CSSPS added a degree

of fairness to the positioning of eligible students against the manual method to a large extent. In increasing the enrolment of the least endowed schools, the CSSPS has not had a positive and meaningful effect. The situation exists since, even with the advent of the CSSPS, the infrastructural, teaching and input conditions of the least endowed schools have not been improved to serve as an enticing factor for students to move from clamouring for the less common ones for endowed schools.

While the enrolment of the least endowed schools has not been increased to a large degree by the CSSPS, the enrolment of rural schools has increased nominally. The CSSPS's selection and placement on merit have confined average, and brilliant rural students with low BECE scores to their local and community schools to the slightly swelling student population in rural schools as most of the outlets of bribery and favouritism to endowed schools have been minimised. With the inception of the CSSPS, at least with the placement of the first batch of eligible students, the excessive delay in the selection and placement of qualified students that defined the manual selection and placement system was partly minimised. Subsequent mob-up exercise placements, however, are also riddled by the delay syndrome. In general, the CSSPS has reduced the problems that characterised the manual system to a great extent; thus, on this basis, the CSSPS is a stronger alternative to the manual system as a method for selecting and placing eligible students in SHS, technical and vocational institutions. The CSSPS's inception has not altered the trend of preference and disparity in the choice of endowed schools as first, second and third placement choices. The holistic interpretation of the CSSPS by stakeholders was that it removed SHS Heads' misdemeanour behaviour of favouritism, bribery, corruption and anger. The majority of parents and students holds this opinion.

The CSSPS has added fairness to the selection and placement process based solely on merit on the part of the SHS Heads and GES / MOE employees. Based on the repeated refinement of the CSSPS over the study duration of the system's service, the structural and human errors associated with the manual system and the initial stages of the CSSPS implementation have been significantly reduced. The human factor in terms of behaviour is a formidable obstacle that militates against the successful functioning of the CSSPS. This was due to the recurrent reluctance of students and parents to consider placement in the least endowed schools, except in cases where students preferred the schools for placement personally. In a Students' Selection Problem Extensions of the PROMETHEE Method to deal with Segmentation Constraints Application in a Students' Selection Problem, Mavrotas & Rozakis (2012) investigated application in a Students' Selection Problem Extensions of the PROMETHEE Method to deal with Segmentation Constraints Application in a Students' Selection Problem.

The possibility of enabling incomparability among the alternatives, which is considered to be one of the advantages of the outranking methods, is better described with PROMETHEE V2 if it should also be remembered that the decision-makers were very pleased that they were in control of the actual decision-making and not of the performance of an optimisation programme. Besides, they agree that the differentiation between the candidates in the three sets was beneficial: the orange, the red, and the grey. In this way, by concentrating on the grey set (reduced set of candidates), they can decrease the cognitive workload needed during the last step of the decision process. Transparency characterises the whole decision-making process as the decision-makers will see the outcomes of their assessment and even the results of other decision-makers. In their decisions, they can also realise the degree of consensus, quantified by the

number of alternatives in the green package. Also, the choice between ambiguous alternatives (the grey set) is based on the concept of the generally agreed majority, which is easily implemented via the acceptable IP model. For these reasons, as the decision-making process is clear, objective and straightforward, the decision-makers feel very happy with the outcome. The biggest challenge to the implementation of PROMETHEE V2 is the lack of commonly available applications to generate optimal solutions for the bi-objective IP model for Pareto. However, other techniques that generate representations of the Pareto set by using traditional IP software (such as the ε- constraint method) can be used instead of the MCBB method.

CHAPTER THREE

METHODOLOGY

3.1 Introduction

The generalised objective of the research was to evaluate the computerised system used in admitting students into public Colleges of Education. This chapter covered the introduction, population, data collection instrument, research design, sampling technique, data collection procedure, validity and reliability, pilot study, the procedure for the analysis of the data, and ethical consideration.

3.2 Research Design

A research design illustrates how it is possible to solve a problem under investigation (Lewis, Colombo, Lawrence, & Chandler, 2019). The primary concern of the study was to evaluate how the computerised system of admission into colleges of education affiliated with the University of Cape Coast has impacted on the efficiency, reliability and credibility of the entire admission process. The type of research design for the study was explanatory research with a quantitative research design. Quantitative methodologies were used in gathering data (Gummesson, 1991). The quantitative research enabled the researcher to develop questionnaires for the study (Grace-martin, Gay, & Ph, 2014). The research design was appropriate because unbiased samples were selected from a population of admission officers, quality assurance staff, and Heads of departments at colleges of education affiliated with the University of Cape Coast. However, the researcher largely relied on primary and secondary sources of information in gathering data to assess the phenomenon of usage of computerised systems for admissions and how it affects the efficiency, reliability and credibility of the process at the colleges of education affiliated to the University of Cape Coast.

3.3 Population

Geographically, the study focused on computerised admissions at 46 colleges of education in Ghana. The population was the group or individuals to whom the survey applies (Muianga, Barbutiu, & Hansson, 2019). The researcher, Out of the 46 colleges of education in Ghana, sixteen (16) colleges of education affiliated with the University of Cape Coast was used for the study. Therefore, the total population consists of all admission officers, quality assurance staff, and Heads of departments at the colleges of education affiliated with the University of Cape Coast. The total population for the study was two hundred and fifty-five (255) admission officers, quality assurance staff, and Heads of departments. Ninety-eight (98) of the population were females, and one hundred and fifty-seven (157) of the rest were males.

3.4 Sample Size and Sampling Technique(s)

Purposive sampling was used to select all the sixteen (16) colleges of education affiliated with the University of Cape Coast. Because in purposive sampling, the cases to be used in the sample are handpicked based on their judgment of their typicality or particularly knowledgeable about the issues under study (Leedy & Ormrod, 2005). The researcher used an online sample size calculator from survey monkey with a population of two hundred and fifty-five (255) with a confidence level of 95% and a 5% margin error. A 95% confidence level means the researcher is 95% sure that if the population were allowed to respond, 95% would choose what the sample size has chosen. The researchers' sample size for the study was one hundred and ninety-two (192). For the sample size to be representative, the researcher used stratified sampling in selecting participants for the study. Since there were plenty of males in the population, the majority of males were selected over females for the study. The researcher selected the

sample size by calculating a fraction of males over the population (157/255) of the sample for men which was one hundred and eighteen (118) and another fraction of females over the population (98/255) of the sample for females which was seventy-four (74).

3.5 Sources of Data

There were both secondary and primary data sources included. The primary source of data was obtained from the admissions office at the 16 colleges of education affiliated with the University of Cape Coast. Secondary data is defined by Cooper and Schindler (2003) as data gathered for purposes other than the research project completion. The secondary sources were obtained from journals, articles, and websites of the various universities in Ghana, and the ministry of education, Ghana from the internet.

3.6 Data Collection Instrument

The questionnaire survey was carried out to collect data from admission officers, quality assurance staff, and Heads of departments from the various departments on the Academic Board. Semi-structured questionnaires (slightly modified) was designed, one for admission officers from the three members of the Academic Board; admission officers at the main registry; and quality assurance officers of the school. A questionnaire was designed to get information that can be obtained through the subjects' written responses. For clarity and ease of understanding, the items in the questionnaire were formulated in simple language. The researcher administered clear instructions to the subjects to aid valid responses. Likert-type scales of seven points were given ranging from “1” to “7”- from “strongly disagree” to “strongly agree”. The questionnaire consists of two main sections (Lin et al., 2019), that was section A and

B. Section “A” consisted of the background of respondents. Section B consisted of items under each of the objectives. That is nine (9) items under the efficiency of the electronic sorting and selection of applications. Six (6) items under the reliability of the system were adhering to pre-determined criteria. Four (4) items under the challenges in the use of the computerised system for admission into the colleges of education that are affiliated to the University of Cape Coast. The questionnaire for the study was taken online because the researcher coded it in Google forms.

3.7 Data Collection Procedure

A letter to seek permission was sent to the principals of the sixteen colleges of education affiliated with the University of Cape Coast to permit the researcher to use the admission officers, quality assurance staff, and Heads of departments as respondents of the study. Respondents were briefed about the study, but the researcher could not go there to administer the questionnaires because of the worldwide pandemic (Glass & Song, 2019). Due to the issue of the worldwide pandemic, the researcher coded the questionnaire with Google forms and sent the link to the participants' WhatsApp group with instructions on how to answer the questionnaire. They were given prior notification as to when the researcher would need their responses. The researcher gave them a telephone number on the Google forms to call for further explanation if needed. Priorities were given as to whether participants wanted to take part or not, if ‘Yes’ then the participants would proceed to answer the items in the questionnaire. The research questionnaire coded in the Google forms would take 15 minutes for respondents to answer the items in it (Liao, Robert, Gurung, & Shi, 2015). Within three weeks, data was obtained.

3.8 Pilot Study

The researcher carried out a pilot test with a small group of the population in order to determine the facial validity of the questionnaires. The total participants for the pilot study were twenty (20) admission officers, quality assurance staff, and Heads of departments. The questionnaire was pretested with twenty (20) employees at the admissions office of St. Louis College of Education, Kumasi-Primary, Early Grade & JHS Education (Home Economics), and Presby Women's College of Education, Aburi Primary, Early Grade & JHS Education (Home Economics). The researcher chose St. Louis College of Education, Kumasi-Primary, Early Grade & JHS Education (Home Economics) and Presby Women's College of Education, Aburi Primary, Early Grade & JHS Education (Home Economics) who are affiliated to the University of Education, Winneba because they were not part of the study. The pilot study was done to check if the items in the questionnaire were valid and reliable for the study as statistical conditions were not required because respondents were conveniently chosen for this pilot study (Cooper and Schindler, 2003). Revisions were made based on the reviews, comments, and suggestions from the respondents. Respondents would, therefore have no trouble answering the questions in the broad sample.

3.9 Data Reliability and Validity

3.9.1 Validity

The validity of an instrument is the extent to which data collection instrument tests what it is supposed to measure (Polit & Hungler 1993). The degree to which an instrument describes the variables under analysis is called content validity. The questionnaires contained several items on study subject information (Polit & Hungler 1993). Furthermore, content validity was assured by continuity in the administration of the

questionnaires. The supervisor of the researcher vetted the data collection methods. This was to assess the tools' face and content validity. The corrections and changes made by the supervisor, however, were carried out and research statements or objects were reconstructed based on the supervisor's satisfactory comments. This allowed the researcher to build tools that provided valid data (Ciência, Moreira, & Figueiredo, 2019).

3.9.2 Reliability

Reliability is referred to by Polit and Hungler (1993) as the degree of accuracy with which an instrument calculates the attribute that it is intended to calculate. Consistency in responses was revealed by the questionnaires answered by respondents in the pilot study. The effectiveness reliability of the items in the questionnaire was tested using SPSS. After the pilot study, responses from respondents were coded and analysed in SPSS. Reliability results were generated to check the Cronbach alpha, which is illustrated in table 1. Table one shows that the Cronbach alpha for reliability was .810.

Table 1: Reliability Statistics of the Pilot Study

Reliability Statistics

Cronbach's Alpha	N of Items
.810	32

3.10 Data Analysis

The responses were examined critically. Quantitative analysis was done with the use of The Statistical Package for Social Sciences (SPSS). This software was used because of its user-friendly interface, accuracy, reliability, and the most analytical tool used in research. The data analysis technique were inferential statistics and descriptive statistics. The presentation of data was done using tables and figures.

3.11 Ethical Considerations

There are certain ethical problems to be observed by all human organisations. Among other ethical concerns relating to the personnel of the College of Education affiliated to the University of Cape Coast is the disclosure of knowledge by staff that can impact an institution. These were dealt with by first describing to the respondents the nature of the study through a letter, Zoom, and WhatsApp. The information obtained from respondents were confidential by ensuring that the data collection did not include their names and other information that could show their identity. To find answers to the research questions, respondents were made to understand their positions in the data collection activity. Respondents were given the option of opting out of the exercise in any way that would affect them in order to avoid forcing questionnaires on them. The above-mentioned methods and procedures were used in the search for the appropriate data for the study captured in the next chapter.

CHAPTER FOUR

ANALYSIS OF RESULTS

4.1 Introduction

The general objective of this research was to evaluate the computerized system used in admitting students into public Colleges of Education. The chapter constituted the demographic background of the study and the results of the study based on the research questions.

4.2 Respondents' Demographic Characteristics

This section describes the status of gender, work experience, highest qualification, and type of employment. To ensure that qualified respondents respond to the questionnaire and also inform respondents about their qualifications for this study, the researcher collected respondents' demographic characteristics.

Table 2: Respondents' Demographic Characteristics

Variables	Frequency (f)	Percentage (%)
Gender		
Male	83	43.2%
Female	109	56.8%
Total	**192**	**100.0**
Highest Qualification		
Bachelor's Degree	163	84.9%
Master's Degree	29	15.1%
PhD Degree	0	0%
Total	**192**	**100.0**
Type of Employment		
Part-time	0	0%
Contract	0	0%
Permanent	192	100%
Total	**192**	**100.0**
Work Experience		
Less than three years	23	12%
3–7 years	95	49.5%
8–15 years	36	18.8%
15 years and above	38	19.8%
Total	**192**	**100.0**

Source: Researcher's fieldwork, (2020)

Table 2 shows that eighty-three of the respondents, representing 43.2%, were males and one hundred and nine of the remaining respondents, representing 56.8%, were females. One hundred and sixty-three of the respondents, representing 84.9% had attained a bachelor's degree, and twenty-nine of the remaining respondents representing 15.1% had attained a master's degree. With the type of employment, they are in none of the respondents work on a part-time and contract basis. So all the respondents representing one hundred and ninety-two work on permanent basis. Twenty-three of the respondents

representing 12% had a working experience less than 3 years, ninety-five of the respondents representing 49.5% had a working experience between 3 and 7 years, thirty-six of the respondents representing 18.8% had a working experience between 8 and 15, and thirty-eight of the remaining respondents representing 19.8% had a working experience for about 15years and above.

4.3 Analysis of Results

The analysis of the results presents the reliability test of the response, descriptive statistics, and frequency distribution of the results. To make the interpretation of the results easier for the researcher, items in the questionnaire were coded before interpreting it. For example, items under research question one which asks how efficient have the electronic sorting and selection of admission applications been at colleges of education were coded as EESSA1, EESSA2, EESSA3, EESSA4, EESSA5, EESSA6, EESSA7, EESSA8, and EESSA9. Moreover, items under research question two which ask how reliable has the computerized system at colleges of education been in adhering to pre-determined criteria were coded as RSAPC1, RSAPC2, RSAPC3, RSAPC4, RSAPC5, and RSAPC6. Also, items under research question three, which ask what the challenges in the use of the computerized system for admission into colleges of education were coded as CCSACE1, CCSACE2, CCSACE3, CCSACE4.

Table 3: Reliability Test for the Variables

Variable	Number of Items	Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items
EESSA	9	0.735	0.747
RSAPC	6	0.613	0.599
CCSACE	4	0.806	0.808

Source: Researcher's fieldwork, (2020)

The table 4.3 shows a Cronbach's Alpha of 0.735 (73.5% consistent good result) for efficient use of electronic sorting and selection of admission applications at colleges of education affiliated to the University of Cape Coast (EESSA), 0.613 (61.3% good result) for reliable use of the computerized system at colleges of education affiliated to the University of Cape Coast in adhering to pre-determined criteria (RSAPC), and 0.806 (80.6% consistent good result) for challenges in the use of the computerized system for admission into colleges of education affiliated to the University of Cape Coast (CCSACE). This means that the variables were reliable.

Research Question One

How efficient has the electronic sorting and selection of admission applications been at colleges of education affiliated to the University of Cape Coast? The study sought to answer the research question stated above using analysis from the responses of respondents in the study.

Table 4: Descriptive Statistics for Research Question One

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
EESSA4	192	1.00	7.00	6.4115	1.15884	-3.301	.175	11.515	.349
EESSA1	192	1.00	7.00	6.3906	1.43206	-3.101	.175	8.976	.349
EESSA3	192	1.00	7.00	6.3281	1.32303	-2.680	.175	6.891	.349
EESSA2	192	1.00	7.00	6.3125	1.60700	-2.815	.175	6.659	.349
EESSA5	192	1.00	7.00	6.2292	1.02818	-3.101	.175	12.673	.349
EESSA7	192	2.00	7.00	5.7135	.96874	-2.749	.175	7.971	.349
EESSA8	192	1.00	7.00	5.6094	1.13420	-2.515	.175	7.784	.349
EESSA6	192	1.00	7.00	5.4635	1.24435	-1.629	.175	2.935	.349
EESSA9	192	1.00	7.00	5.4375	1.11920	-1.812	.175	4.412	.349

Source: Researchers' field survey, 2020

From table 4 above, it indicates that verification of college requirements using computerized selection system (EESSA4) has the highest mean of 6.4115 which means that verification of college requirements using computerized selection system has a high factor as compared to other factors to the efficiency of electronic sorting and selection of admission applications at colleges of education. The next factor to the efficiency of electronic sorting and selection of admission applications at colleges of education is issuing admission letters after admission makes it efficient (EESSA1) which has the second-highest mean of 6.3906. The next factor to the efficiency of electronic sorting and selection of admission applications at colleges of education is testing for duplicate files using the computerized selection system (EESSA3) which has the third-highest mean of 6.3281. The next factor to the efficiency of electronic sorting and selection of admission applications at colleges of education is checking the application forms using the computerized selection system (EESSA2), which has the fourth-highest mean of

6.3125. The next factor to the efficiency of electronic sorting and selection of admission applications at colleges of education is the verification of seat availability using a computerized selection system (EESSA5) which has the fifth-highest mean of 6.2292. The next factor to the efficiency of electronic sorting and selection of admission applications at colleges of education is distributions of admission letters using a computerized selection system (EESSA7) which has the sixth-highest mean of 5.7135.

The next factor to the efficiency of electronic sorting and selection of admission applications at colleges of education is that if the student is not accepted, he goes to step-2 to repeat the procedures for other colleges using a computerized selection system (EESSA8) which has the seventh-highest mean of 5.6094. The next factor to the efficiency of electronic sorting and selection of admission applications at colleges of education is acceptance and producing acceptance documents manually using a computerized selection system (EESSA6) which has the eighth highest mean of 5.4635. The last factor to the efficiency of electronic sorting and selection of admission applications at colleges of education is that if the student cannot be allocated to any college, the student may get conditional acceptance in any available college using a computerized selection system (EESSA9) which has the least mean of 5.4375. Also, Table 4 shows that the mean ranges from 5.4375 to 6.4115; this shows the centre of the distribution. The measure of dispersion (standard deviation) widely spread the distribution by .96874 to 1.60700, representing the average distance a score is from the mean. The skewness is from -3.301 to -1.629, which means the variable is sufficiently normal. The kurtosis of all the items is greater than 4, and less than 13, which means that it has relatively few outliers and scores are more clustered around the mean.

Table 5: Frequency Statistics for Research Question One

Items	SD		D		SLD		NA/D		SLA		Agree		SA	
	F	%	F	%	F	%	F	%	F	%	F	%	F	%
EESSA1	11	5.7	0	0	0	0	1	.5	5	2.6	38	19.8	137	71.4
EESSA2	15	7.8	0	0	0	0	0	0	1	.5	40	20.8	136	70.8
EESSA3	3	1.6	9	4.7	0	0	0	0	11	5.7	44	22.9	125	65.1
EESSA4	3	1.6	6	3.1	0	0	0	0	0	0	65	33.9	118	61.5
EESSA5	3	1.6	3	1.6	0	0	0	0	9	4.7	97	50.5	80	41.7
EESSA6	3	1.6	8	4.2	3	1.6	14	7.3	42	21.9	99	51.6	23	12.0
EESSA7	0	0	9	4.7	0	0	6	3.1	17	8.9	150	78.1	10	5.2
EESSA8	6	3.1	3	1.6	0	0	3	1.6	46	24	115	59.9	19	9.9
EESSA9	3	1.6	6	3.1	0	0	15	7.8	54	28.1	99	51.6	15	7.8

Key: SD = Strongly Disagree, D = Disagree, SLD = Slightly Disagree, N = Neither Agree nor Disagree, SLA = Somewhat Agree, A = Agree, SA = Strongly Agree

Source: Researcher's Field Survey, 2020

Table 5 shows that eleven respondents representing 5.7% strongly disagreed that issuing the admission letters after admission makes electronic sorting and selection of applications efficient (EESSA1), one respondent, representing 0.5%, neither agreed nor disagreed that issuing the admission letters after admission makes electronic sorting and selection of applications efficient (EESSA1), five respondents, representing 2.6%, slightly agreed that issuing the admission letters after admission makes electronic sorting and selection of applications efficient (EESSA1), thirty-eight respondents, representing 19.8%, agreed that issuing the admission letters after admission makes electronic sorting and selection of applications efficient (EESSA1). One hundred and thirty-seven respondents, representing 71.4%, strongly agreed that issuing the

admission letters after admission makes electronic sorting and selection of applications efficient (EESSA1). A mean value of 6.3906 in table 5 explains that respondents agreed that issuing the admission letters after admission makes electronic sorting and selection of applications efficient (EESSA1).

Fifteen respondents, representing 7.8%, strongly disagreed that electronic sorting and selection of applications is efficient in checking the application forms (EESSA2), one respondent, representing 0.5%, slightly agreed that electronic sorting and selection of applications is efficient in checking the application forms (EESSA2), forty respondents, representing 20.8%, agreed that electronic sorting and selection of applications is efficient in checking the application forms (EESSA2), one hundred and thirty-six respondents, representing 70.8%, strongly agreed that electronic sorting and selection of applications is efficient in checking the application forms (EESSA2). A mean value of 6.3125 in table 5 explains that respondents agreed that electronic sorting and selection of applications is efficient in checking the application forms (EESSA2).

Three respondents, representing 1.6%, strongly disagreed that electronic sorting and selection of applications is efficient for testing duplicate files (EESSA3), nine respondents, representing 4.7%, disagreed that electronic sorting and selection of applications is efficient for testing duplicate files (EESSA3), eleven respondents, representing 5.7%, slightly agreed that electronic sorting and selection of applications is efficient for testing duplicate files (EESSA3), forty-four respondents, representing 22.9%, agreed that electronic sorting and selection of applications are efficient for testing duplicate files (EESSA3), and one hundred and twenty-five respondents, representing 65.1%, strongly agreed that electronic sorting and selection of applications

is efficient for testing duplicate files (EESSA3). A mean value of 6.3281 in table 5 explains that respondents agreed that electronic sorting and selection of applications is efficient for testing duplicate files (EESSA3).

Three respondents, representing 1.6%, strongly disagreed that electronic sorting and selection of applications is efficient for verification of college requirements (EESSA4), six respondents, representing 3.1%, disagreed that electronic sorting and selection of applications is efficient for verification of college requirements (EESSA4), sixty-five respondents, representing 33.9%, agreed that electronic sorting and selection of applications is efficient for verification of college requirements (EESSA4). One hundred and eighteen respondents, representing 61.5%, strongly agreed that electronic sorting and selection of applications is efficient for verification of college requirements (EESSA4). A mean value of 6.4115 in table 5 explains that respondents agreed that electronic sorting and selection of applications is efficient for verification of college requirements (EESSA4).

Three respondents, representing 1.6%, strongly disagreed that electronic sorting and selection of applications is efficient for verification of seat availability (EESSA5), three respondents, representing 1.6%, disagreed that electronic sorting and selection of applications is efficient for verification of seat availability (EESSA5), nine respondents, representing 4.7%, slightly agreed that electronic sorting and selection of applications is efficient for verification of seat availability (EESSA5), ninety-seven respondents, representing 50.5%, agreed that electronic sorting and selection of applications is efficient for verification of seat availability (EESSA5). One hundred and eighty respondents, representing 41.7%, strongly agreed that electronic sorting and selection

of applications is efficient for verification of seat availability (EESSA5). A mean value of 6.2292 in table 5 explains that respondents agreed that electronic sorting and selection of applications is efficient for verification of seat availability (EESSA5).

Three respondents, representing 1.6%, strongly disagreed that electronic sorting and selection of applications is efficient for acceptance and producing acceptance document manually (EESSA6), eight respondents, representing 4.2%, disagreed that electronic sorting and selection of applications is efficient for acceptance and producing acceptance document manually (EESSA6), three respondents, representing 1.6%, slightly disagreed that electronic sorting and selection of applications is efficient for acceptance and producing acceptance document manually (EESSA6), fourteen respondents, representing 7.3%, neither agreed nor disagreed that electronic sorting and selection of applications is efficient for acceptance and producing acceptance document manually (EESSA6), forty-two respondents, representing 21.9%, slightly agreed that electronic sorting and selection of applications is efficient for acceptance and producing acceptance document manually (EESSA6), ninety-nine respondents, representing 51.6%, agreed that electronic sorting and selection of applications is efficient for acceptance and producing acceptance document manually (EESSA6), and twenty-three respondents, representing 12%, strongly agreed that electronic sorting and selection of applications is efficient for acceptance and producing acceptance document manually (EESSA6). A mean value of 5.4635 in table 5 explains that respondents agreed that electronic sorting and selection of applications is efficient for acceptance and producing acceptance document manually (EESSA6).

Nine respondents, representing 4.7%, disagreed that electronic sorting and selection of applications is efficient for distributions of admission letters (EESSA7), six respondents, representing 3.1%, neither agreed nor disagreed that electronic sorting and selection of applications is efficient for distributions of admission letters (EESSA7), seventeen respondents, representing 8.9%, slightly agreed that electronic sorting and selection of applications is efficient for distributions of admission letters (EESSA7), one hundred and fifty respondents, representing 78.1%, agreed that electronic sorting and selection of applications is efficient for distributions of admission letters (EESSA7). Ten respondents, representing 5.2%, strongly agreed that electronic sorting and selection of applications is efficient for distributions of admission letters (EESSA7). A mean value of 5.7135 in table 5 explains that respondents agreed that electronic sorting and selection of applications is efficient for distributions of admission letters (EESSA7).

Six respondents, representing 3.1%, strongly disagreed that electronic sorting and selection of applications is efficient to the extent that if the student is not accepted, the system goes to step-2 to repeat the procedures for other college (EESSA8), three respondents, representing 1.6%, disagreed that electronic sorting and selection of applications is efficient to the extent that if the student is not accepted, the system goes to step-2 to repeat the procedures for other college (EESSA8), three respondents, representing 1.6%, neither agreed nor disagreed that electronic sorting and selection of applications is efficient to the extent that if the student is not accepted, the system goes to step-2 to repeat the procedures for other college (EESSA8), forty-six respondents, representing 24%, slightly agreed that electronic sorting and selection of applications is efficient to the extent that if the student is not accepted, the system goes to step-2 to

repeat the procedures for other college (EESSA8), one hundred and fifteen respondents, representing 59.9%, agreed that electronic sorting and selection of applications is efficient to the extent that if the student is not accepted, the system goes to step-2 to repeat the procedures for other college (EESSA8), and nineteen respondents, representing 19%, strongly agreed that electronic sorting and selection of applications is efficient to the extent that if the student is not accepted, the system goes to step-2 to repeat the procedures for other college (EESSA8). A mean value of 5.6094 in table 4.5 explains that respondents agreed that electronic sorting and selection of applications is efficient to the extent that if the student is not accepted, the system goes to step-2 to repeat the procedures for other colleges (EESSA8).

Six respondents, representing 3.1%, strongly disagreed that electronic sorting and selection of applications is efficient to the extent that if the student cannot be allocated to any college, the student may get conditional acceptance in any available college (EESSA9), three respondents, representing 1.6%, disagreed that electronic sorting and selection of applications is efficient to the extent that if the student cannot be allocated to any college, the student may get conditional acceptance in any available college (EESSA9), three respondents, representing 1.6%, neither agreed nor disagreed that electronic sorting and selection of applications is efficient to the extent that if the student cannot be allocated to any college, the student may get conditional acceptance in any available college (EESSA9), forty-six respondents, representing 24%, slightly agreed that electronic sorting and selection of applications is efficient to the extent that if the student cannot be allocated to any college, the student may get conditional acceptance in any available college (EESSA9), one hundred and fifteen respondents, representing 59.9%, agreed that electronic sorting and selection of applications is

efficient to the extent that if the student cannot be allocated to any college, the student may get conditional acceptance in any available college (EESSA9), and nineteen respondents, representing 19%, strongly agreed that electronic sorting and selection of applications is efficient to the extent that if the student cannot be allocated to any college, the student may get conditional acceptance in any available college (EESSA9). A mean value of 5.4375 in table 5 explains that respondents agreed that electronic sorting and selection of applications is efficient to the extent that if the student cannot be allocated to any college, the student may get conditional acceptance in any available college (EESSA9).

Research Question Two

How reliable has the computerized system at colleges of education affiliated with the University of Cape Coast been in adhering to pre-determined criteria? The study sought to answer the research question stated above using analysis from the responses of respondents in the study.

Table 6: Descriptive Statistics for Research Question Two

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
RSAPC2	192	2.00	7.00	6.6094	.78501	-2.861	.175	11.435	.349
RSAPC6	192	5.00	7.00	6.5573	.64463	-1.164	.175	.204	.349
RSAPC3	192	1.00	7.00	6.5000	.96537	-3.334	.175	14.277	.349
RSAPC1	192	2.00	7.00	6.3594	.97670	-2.103	.175	5.401	.349
RSAPC4	192	1.00	7.00	5.7656	1.29529	-2.506	.175	6.864	.349
RSAPC5	192	1.00	7.00	5.7552	1.37953	-2.260	.175	5.237	.349

Source: Researchers' field survey, 2020

From table 6 above, it indicates that admission of graduate students from senior high school is have been shown to improve the programme objectives (RSAPC2) has the highest mean of 6.6094 which means that admission of graduate students from senior high school that is have been shown to improve the programme objectives has a high factor as compared to other factors to the reliability of the system is adhering to pre-determined criteria of colleges of education. The next factor to the reliability of the system is adhering to pre-determined criteria of colleges of education is that all the applications are recorded (RSAPC6), which has the second-highest mean of 6.5573. The next factor to the reliability of the system is adhering to pre-determined criteria of colleges of education is that each student's record is to be personally checked to ensure that he/she fulfils the requirements (RSAPC3) which have the third-highest mean of 6.5000. The next factor to the reliability of the system is adhering to pre-determined criteria of colleges of education is the classification of students using a computerized selection system at colleges of education (RSAPC1) which has the fourth-highest mean of 6.3594. The next factor to the reliability of the system is adhering to pre-determined criteria of colleges of education is that the computerized selection system is reliable for admission anytime there is a new academic year for admission (RSAPC4) which has the fifth-highest mean of 5.7656.

The next factor to the reliability of the system is adhering to the pre-determined criteria of colleges of education is that the computerized selection system is reliable for admission anytime there is a new academic year for admission (RSAPC5) which has the fifth-highest mean of 5.7552. Also, table 4.6 shows that the mean ranges from 5.7552 to 6.6094; this shows the centre of the distribution. The measure of dispersion (standard deviation) widely spread the distribution by .64463 to 1.37953, representing

the average distance a score is from the mean. The skewness is from -1.164 to -3.334, which means the variable is sufficiently normal. The kurtosis of items RSAPC6 is less than 0, which means that it has fewer outliers relative to normal distribution. Items RSAPC1, RSAPC2, RSAPC3, RSAPC4, and RSAPC5 is greater than 0, and less than 15, which means that it has relatively few outliers and scores are more clustered around the mean.

Table 7: Frequency Statistics for Research Question Two

Items	**SD**		**D**		**SLD**		**NA/D**		**SLA**		**Agree**		**SA**	
	F	%	F	%	F	%	F	%	F	%	F	%	F	%
RSAPC1	0	0	3	1.6	0	0	9	4.7	12	6.3	57	29.7	111	57.8
RSAPC2	0	0	2	1.0	0	0	0	0	16	8.3	33	17.2	141	73.4
RSAPC3	2	1.0	2	1.0	0	0	2	1.0	9	4.7	50	26.0	127	66.1
RSAPC4	9	4.7	2	1.0	0	0	2	1.0	27	14.1	113	58.9	39	20.3
RSAPC5	9	4.7	4	2.1	0	0	4	2.1	24	12.5	105	54.7	46	24.0
RSAPC6	0	0	0	0	0	0	0	0	16	8.3	53	27.6	123	64.1

Key: SD = Strongly Disagree, D = Disagree, SLD = Slightly Disagree, N = Neither Agree nor Disagree, SLA = Somewhat Agree, A = Agree, SA = Strongly Agree

Source: Researcher's Field Survey, 2020

Table 7 shows that three respondents, representing 1.6%, disagreed that the classification of students done by the computerized system is reliable (RSAPC1), nine respondents, representing 4.7%, neither agreed nor disagreed that the classification of students done by the computerized system is reliable (RSAPC1), twelve respondents, representing 6.3%, slightly agreed on the classification of students done by the computerized system is reliable (RSAPC1), fifty-seven respondents, representing

29.7%, agreed that the classification of students done by the computerized system is reliable (RSAPC1), and one hundred and one respondents, representing 57.8%, strongly agreed that the classification of students done by the computerized system is reliable (RSAPC1). A mean value of 6.3594 in table 4.7 explains that respondents agreed that the classification of students done by the computerized system is reliable (RSAPC1).

Two respondents, representing 1.0%, disagreed that admission of graduate students from senior high school has been shown to improve the programme objectives of the computerized system for admission (RSAPC2), sixteen respondents, representing 8.3%, slightly agreed that admission of graduate students from senior high school had been shown to improve the programme objectives of the computerized system for admission (RSAPC2), thirty-three respondents, representing 17.2%, agreed that admission of graduate students from senior high school had been shown to improve the programme objectives of the computerized system for admission (RSAPC2). One hundred and forty-one respondents, representing 73.4%, strongly agreed that each student's record is personally checked at ease with the help of the computerized system to ensure that he/she fulfils the requirements for the admission (RSAPC2). A mean value of 6.6094 in table 4.7 explains that respondents agreed that admission of graduate students from senior high school had been shown to improve the programme objectives of the computerized system for admission (RSAPC2).

Two respondents, representing 1.0%, strongly disagreed that each student's record is personally checked at ease with the help of the computerized system to ensure that he/she fulfils the requirements for the admission (RSAPC3), two respondents, representing 1.0%, disagreed that each student's record is personally checked at ease with the help of the computerized system to ensure that he/she fulfils the requirements

for the admission (RSAPC3), two respondents, representing 1.0%, neither agreed nor disagreed that each student's record is personally checked at ease with the help of the computerized system to ensure that he/she fulfils the requirements for the admission (RSAPC3), nine respondents, representing 4.7%, slightly agreed that each student's record is personally checked at ease with the help of the computerized system to ensure that he/she fulfils the requirements for the admission (RSAPC3), fifty respondents, representing 26%, agreed that each student's record is personally checked at ease with the help of the computerized system to ensure that he/she fulfils the requirements for the admission (RSAPC3), and one hundred and twenty-seven respondents, representing 66.1%, strongly agreed that each student's record is personally checked at ease with the help of the computerized system to ensure that he/she fulfils the requirements for the admission (RSAPC3). A mean value of 6.5000 in table 7 explains that respondents agreed that each student's record is personally checked at ease with the help of the computerized system to ensure that he/she fulfils the requirements for the admission (RSAPC3).

Nine respondents, representing 4.7%, strongly disagreed that with computerized system for admission, it is reliable for admission anytime there is a new academic year (RSAPC4), two respondents, representing 1.0%, disagreed that with computerized system for admission, it is reliable for admission anytime there is a new academic year (RSAPC4), two respondents, representing 1.0%, neither agreed nor disagreed that with computerized system for admission, it is reliable for admission anytime there is a new academic year (RSAPC4), twenty-seven respondents, representing 14.1%, slightly agreed that with computerized system for admission, it is reliable for admission anytime there is a new academic year (RSAPC4), one hundred and thirteen respondents,

representing 58.9%, agreed that with computerized system for admission, it is reliable for admission anytime there is a new academic year (RSAPC4), and forty-six respondents, representing 24%, strongly agreed that with computerized system for admission, it is reliable for admission anytime there is a new academic year (RSAPC4). A mean value of 5.7656 in table 7 explains that respondents agreed that with a computerized system for admission, it is reliable for admission anytime there is a new academic year (RSAPC4).

Nine respondents representing, 4.7%, strongly disagreed that a computerized system for admission tallied records of admission letters issued after admission (RSAPC5), four respondents, representing 2.1%, disagreed that a computerized system for admission tallied records of admission letters issued after admission (RSAPC5), four respondents, representing 2.1%, neither agreed nor disagreed that computerized system for admission tallied records of admission letters issued after admission (RSAPC5), twenty-four respondents, representing 12.5%, slightly agreed that computerized system for admission tallied records of admission letters issued after admission (RSAPC5), one hundred and five respondents, representing 54.7%, agreed that computerized system for admission tallied records of admission letters issued after admission (RSAPC5). Forty-six respondents, representing 24%, strongly agreed that the computerized system for admission tallied records of admission letters issued after admission (RSAPC5). A mean value of 5.7552 in table 7 explains that respondents agreed that the computerized system for admission tallied records of admission letters issued after admission (RSAPC5).

Sixteen respondents, representing 8.3%, slightly agreed that a computerized system for admission is used to record all the applications during and after admission (RSAPC6), fifty-three respondents, representing 27.6%, agreed that a computerized system for admission is used to record all the applications during and after admission (RSAPC6). One hundred and twenty-three respondents, representing 64.1%, strongly agreed that the computerized system for admission is used to record all the applications during and after admission (RSAPC6). A mean value of 6.2292 in table 4.7 explains that respondents agreed that the computerized system for admission is used to record all the applications during and after admission (RSAPC6).

Research Question Three

What are the challenges in the use of the computerized system for admission into colleges of education affiliated with the University of Cape Coast? The study sought to answer the research question stated above using analysis from the responses of respondents in the study.

Table 8: Descriptive Statistics for Research Question Three

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
CCSACE1	192	1.00	7.00	4.7031	2.07210	-.535	.175	-1.312	.349
CCSACE2	192	1.00	7.00	3.5729	2.03758	.218	.175	-1.484	.349
CCSACE3	192	1.00	7.00	3.5573	2.03808	.290	.175	-1.401	.349
CCSACE4	192	1.00	7.00	2.8750	1.71382	.669	.175	-.822	.349

Source: Researchers' field survey, 2020

From table 8 above, it indicates that for independent of the candidate ranking, the concept of affirmative action specifically implements additional constraints (CCSACE1) has the highest mean of 4.7031 which means that for independent of the candidate ranking, the concept of affirmative action specifically implements additional constraints has a high factor as compared to other factors to the challenges in the use of the computerized system for admission into colleges of education affiliated to the University of Cape Coast. The next factor to the challenges in the use of the computerized system for admission into colleges of education affiliated to the University of Cape Coast is that the system forced some candidates initially selected to concede their place in the list to others far behind (CCSACE2) which has the second-highest mean of 3.5729. The next factor to the challenges in the use of the computerized system for admission into colleges of education affiliated to the University of Cape Coast is the duplicate files (CCSACE3) which have the third-highest mean of 3.5573.

The next factor to the challenges in the use of the computerized system for admission into colleges of education affiliated to the University of Cape Coast is the duplicate files (CCSACE4) which have the least mean of 2.8750. Also, table 4.8 shows that the mean ranges from 2.8750 to 4.7031; this shows the centre of the distribution. The measure of dispersion (standard deviation) widely spread the distribution by 1.71382 to 2.07210, representing the average distance a score is from the mean. The skewness is from -.535 to .669, which means the variable is sufficiently normal. The kurtosis of items CCSACE4 is less than 0, which means that it has fewer outliers relative to normal distribution. Items CCSACE1, CCSACE2, and CCSACE3 are greater than 1 and less than 2, which means that it has relatively few outliers and scores are more clustered around the mean.

Table 9: Frequency Statistics for Research Question Three

Items	SD		D		SLD		NA/D		SLA		Agree		SA	
	F	%	F	%	F	%	F	%	F	%	F	%	F	%
CCSACE1	14	7.3	36	18.8	16	8.3	6	3.1	12	6.3	71	37.0	37	19.3
CCSACE2	36	18.8	44	22.9	30	15.6	4	2.1	23	12.0	44	22.9	11	5.7
CCSACE3	34	17.7	48	25.0	28	14.6	8	4.2	22	11.5	37	19.3	15	7.8
CCSACE4	48	25.0	54	28.1	34	17.7	11	5.7	21	10.9	23	12.0	1	0.5

Key: SD = Strongly Disagree, D = Disagree, SLD = Slightly Disagree, N = Neither Agree nor Disagree, SLA = Somewhat Agree, A = Agree, SA = Strongly Agree

Source: Researcher's Field Survey, 2020

Table 9 shows that fourteen respondents, representing 7.3%, strongly disagreed that the for independent of the candidate ranking, the concept of affirmative action specifically implements additional constraints (CCSACE1), thirty-six respondents, representing 18.8%, disagreed that the for independent of the candidate ranking, the concept of affirmative action specifically implements additional constraints (CCSACE1), sixteen respondents, representing 8.3%, slightly disagreed that the for independent of the candidate ranking, the concept of affirmative action specifically implements additional constraints (CCSACE1), six respondents, representing 3.1%, neither agreed nor disagreed that for independent of the candidate ranking, the concept of affirmative action specifically implements additional constraints (CCSACE1), twelve respondents, representing 6.3%, slightly agreed that for independent of the candidate ranking, the concept of affirmative action specifically implements additional constraints (CCSACE1), seventy-one respondents, representing 37%, agreed that for independent of the candidate ranking, the concept of affirmative action specifically implements additional constraints (CCSACE1), and thirty seven respondents, representing 19.3%, strongly agreed that for independent of the candidate ranking, the concept of affirmative

action specifically implements additional constraints (CCSACE1). A mean value of 6.5000 in table 9 explains that respondents agreed that for independent of the candidate ranking, the concept of affirmative action specifically implements additional constraints (CCSACE1).

Table 9 shows that thirty-six respondents, representing 18.8%, strongly disagreed that one of the challenges of computerized system for admission is that, the system force some candidates initially selected to concede their place in the list to others far behind (CCSACE2), forty-four respondents, representing 22.9%, disagreed that one of the challenges of computerized system for admission is that, the system force some candidates initially selected to concede their place in the list to others far behind (CCSACE2), thirty respondents, representing 15.6%, slightly disagreed that one of the challenges of computerized system for admission is that, the system force some candidates initially selected to concede their place in the list to others far behind (CCSACE2), four respondents, representing 2.1%, neither agreed nor disagreed that one of the challenges of computerized system for admission is that, the system force some candidates initially selected to concede their place in the list to others far behind (CCSACE2), twenty-three respondents, representing 12%, slightly agreed that one of the challenges of computerized system for admission is that, the system force some candidates initially selected to concede their place in the list to others far behind (CCSACE2), forty-four respondents, representing 22.9%, agreed that one of the challenges of computerized system for admission is that, the system force some candidates initially selected to concede their place in the list to others far behind (CCSACE2), and eleven respondents, representing 5.7%, strongly agreed that one of the challenges of computerized system for admission is that, the system force some

candidates initially selected to concede their place in the list to others far behind (CCSACE2). A mean value of 6.5000 in table 9 explains that respondents agreed that one of the challenges of a computerized system for admission is that, the system forces some candidates initially selected to concede their place in the list to others far behind (CCSACE2).

Table 9 shows that thirty-four respondents, representing 17.7%, strongly disagreed that duplicate files is one of the challenges in using computerized system for admission into colleges of education (CCSACE3), forty-eight respondents, representing 25%, disagreed that duplicate files is one of the challenges in using computerized system for admission into colleges of education (CCSACE3), twenty-eight respondents, representing 14.6%, slightly disagreed that duplicate files is one of the challenges in using computerized system for admission into colleges of education (CCSACE3), eight respondents, representing 4.2%, neither agreed nor disagreed that duplicate files is one of the challenges in using computerized system for admission into colleges of education (CCSACE3), twenty-two respondents, representing 11.5%, slightly agreed that duplicate files is one of the challenges in using computerized system for admission into colleges of education (CCSACE3), thirty-seven respondents, representing 19.3%, agreed that duplicate files is one of the challenges in using computerized system for admission into colleges of education (CCSACE3), and fifteen respondents, representing 7.8%, strongly agreed that duplicate files is one of the challenges in using computerized system for admission into colleges of education (CCSACE3). A mean value of 6.5000 in table 9 explains that respondents agreed that duplicate files are one of the challenges in using a computerized system for admission into colleges of education affiliated with the University of Cape Coast (CCSACE3).

Table 9 shows that forty-eight respondents, representing 25%, strongly disagreed that online queue is one of the challenges in using computerized system for admission into colleges of education (CCSACE4), fifty-four respondents, representing 28.1%, disagreed that online queue is one of the challenges in using computerized system for admission into colleges of education (CCSACE4), thirty-four respondents, representing 17.7%, slightly disagreed that online queue is one of the challenges in using computerized system for admission into colleges of education (CCSACE4), eleven respondents, representing 5.7%, neither agreed nor disagreed that online queue is one of the challenges in using computerized system for admission into colleges of education (CCSACE4), twenty-one respondents, representing 10.9%, slightly agreed that online queue is one of the challenges in using computerized system for admission into colleges of education (CCSACE4), twenty-three respondents, representing 12%, agreed that online queue is one of the challenges in using computerized system for admission into colleges of education (CCSACE4), and one respondent, representing 0.5%, strongly agreed that online queue is one of the challenges in using computerized system for admission into colleges of education (CCSACE4). A mean value of 6.5000 in table 4.9 explains that respondents agreed that online queue is one of the challenges in using a computerized system for admission into colleges of education (CCSACE4).

4.4 Correlation Table

Table 10: Correlation for Testing Hypothesis

	Efficient	Reliable	Challenges
Efficient	1		
Reliable	.675**	1	
Challenges	-.255**	-.441**	1

Source: Researcher's Field Survey, 2020

From table 10 above, it shows a positive Pearson Correlation of .675 which means that the high reliability of the computer selection system in adhering to pre-determined criteria, the higher the efficiency of the electronic sorting and selection of applications. Also, a positive Pearson Correlation of .675 means that the high efficiency of the electronic sorting and selection of applications, the higher the reliability of the computer selection system in adhering to pre-determined criteria. Moreover, a negative Pearson Correlation of -.255 means that the challenges in the use of the computerized system for admission into colleges of education reduce the efficiency of the electronic sorting and selection of applications. Furthermore, a negative Pearson Correlation of -.441 means that the challenges in the use of the computerized system for admission into colleges of education reduce the reliability of the computer selection system in adhering to pre-determined criteria.

Also, table 10 shows that, the strength and direction of the relationship between the efficiency of electronic sorting and selection of admission applications and the reliability of the computerized system, the relationship between challenges of using a computerized system for admission and its' reliability, and the relationship between challenges of using a computerized system for admission and its' efficiency. The current study employed a Pearson correlation. The correlation between the efficiency of electronic sorting and selection of admission applications and the reliability of the computerized system for admission was positively high ($r = .675^{**2,}$ $n = 129$, $p < 0.01$) with a significance level of 0%. This explained a 45.6% variation of efficiency of electronic sorting and selection of admission applications in the reliability of the computerized system for admission ($r^2 = .675* .675* 100$). The correlation between the challenges of using a computerized system for admission and its' efficiency was

negatively low ($r = .255^{**}$, $n = 129$, $p < 0.05$) with a significance level of 0.3%. This explained a 6.5% variation of challenges of using computerized system for admission in its' efficiency ($r^2 = .255* .255* 100$).

The correlation between challenges of using computerized system for admission and its' reliability was negatively high ($r = .441^{**}$, $n = 129$, $p < 0.01$) with a significance level of 0%. This explained a 19.5% variation of efficiency of electronic sorting and selection of admission applications in the reliability of the computerized system for admission ($r^2 = .441* .44.1* 100$). There was a positive and high relationship between the efficiency of electronic sorting and selection of admission applications and the reliability of the computerized system. There was a weak negative relationship between the challenges of using a computerized system for admission and its' efficiency. Lastly, there was a negative and high relationship between the challenges of using a computerized system for admission and its' reliability.

4.5 Discussion of Results

To arrive at the first objective of the study to evaluate the efficiency of the electronic sorting and selection of applications, the study found that issuing the admission letters after admission makes electronic sorting and selection of applications efficient. Moreover, the results show that electronic sorting and selection of application is efficient in checking the application forms, testing duplicate files, verifying college requirements, and verifying seat availability. Furthermore, the results revealed that electronic sorting and selection of applications is efficient for acceptance and producing acceptance document manually and distributions of admission letters. Also, the results found that electronic sorting and selection of applications is efficient to the extent that if the student is not accepted, the system goes to step-2 (the next stage) to repeat the

procedures for other colleges, and the extent that if the student cannot be allocated to any college, the student may get conditional acceptance in any available college.

To arrive at the second objective of the study to examine the reliability of the system is adhering to pre-determined criteria, the study revealed that the classification of students done by the computerized system is reliable. Moreover, the results revealed that admission of graduate students from senior high school had been shown to improve the programme objectives of the computerized system for admission. Furthermore, the results of the study found that each student's record is personally checked at ease with the help of the computerized system to ensure that he/she fulfils the requirements for admission. Also, the results of the study show that with a computerized system for admission, shareholders can appoint auditors to work on capital funding in their interest. Lastly, the results of the study revealed that the computerized system for admission tallied records of admission letters issued after admission and are used to record all the applications during and after admission.

To arrive at the third objective of the study to identify challenges in the use of the computerized system for admission into colleges of education affiliated to the University of Cape Coast, the study found that for independent of the candidate ranking, the concept of affirmative action specifically implements additional constraints. Moreover, the results of the study show that one of the challenges of a computerized system for admission is that, the system force some candidates initially selected to concede their place in the list to others far behind. Also, the results of the study found that duplicate files are one of the challenges in using a computerized system for admission into colleges of education affiliated with the University of Cape Coast. Lastly, the results of the study revealed that online queue is one of the challenges in

using a computerized system for admission into colleges of education affiliated to the University of Cape Coast. The findings of the study revealed that the results of the study explained a 45.6% variation of efficiency of electronic sorting and selection of admission applications in the reliability of the computerized system for admission (r^2 = .675* .675* 100). Moreover, the results explained a 6.5% variation of challenges of using computerized system for admission in its' efficiency (r^2 = .255* .255* 100). Lastly, the study explained a 19.5% variation of efficiency of electronic sorting and selection of admission applications in the reliability of the computerized system for admission (r^2 = .441* .44.1* 100).

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

The general objective of the study was to evaluate the computerised system used in admitting students into public Colleges of Education. The chapter constitutes the summary, conclusion and recommendation of the study.

5.2 Summary

The computerised selection system (CSS) consists of a hodgepodge of hardware and software, requiring disparate supporting infrastructures and offering little in the way of integration. Educational institutions normally use the computerised selection system to enhance the admission process. The educational institution in Ghana that mostly uses a computerised selection system is tertiary schools. University admission is organised very differently throughout the world. In Ghana, the criteria for admission into either public Colleges of Educations are generally the same – mainly using records from WAEC organised exams, and benchmarks from the National Accreditation Board (NAB) in determining entry qualifications. Generally, normative decision theory requires agents to have (or be representable as having) consistent preferences, and to choose per their preferences.

The preferences are the admission requirements and restrictions in each academic year are fed to the system before the admission period. The individual admission process is faced with the operation of decision-making processes, and are influenced by the admission requirements of the colleges in their decision-making process. This information includes the lowest limit of grades which can be accepted by each college

for admission in correspondence with the type of the student's high school certificate and the maximum number of students that can be absorbed by the college. Applicants who could not get selected for their first choice programmes are put in the pool for second choice selection. It is believed that strict adherence to the computerised process of admission devoid of any human involvement would ensure efficiency, fairness, reliability, and credibility for the entire process.

The results revealed that verification of college requirements using a computerised selection system had a high factor as compared to other factors to the efficiency of electronic sorting and selection of admission applications at colleges of education. The second highest factor to the efficiency of electronic sorting and selection of admission applications at colleges of education is issuing admission letters after admission makes it efficient. The third highest factor to the efficiency of electronic sorting and selection of admission applications at colleges of education is testing for duplicate files using a computerised selection system. The fourth highest factor to the efficiency of electronic sorting and selection of admission applications at colleges of education is checking the application forms using a computerised selection system. The fifth highest factor to the efficiency of electronic sorting and selection of admission applications at colleges of education is the verification of seat availability using a computerised selection system. The sixth highest factor to the efficiency of electronic sorting and selection of admission applications at colleges of education is distributions of admission letters using a computerised selection system.

The seventh highest factor to the efficiency of electronic sorting and selection of admission applications at colleges of education is that if the student is not accepted, he goes to step-2 to repeat the procedures for other colleges using a computerised selection system. The eighth highest factor to the efficiency of electronic sorting and selection of admission applications at colleges of education is acceptance and producing acceptance documents manually using a computerised selection system. The lowest factor to the efficiency of electronic sorting and selection of admission applications at colleges of education is that if the student cannot be allocated to any college, the student may get conditional acceptance in any available college using a computerised selection system. The results revealed that the admission of graduate students from senior high school had been shown to improve the programme objectives that had the highest factor as compared to other factors to the reliability of the system is adhering to pre-determined criteria of colleges of education.

The second highest factor to the reliability of the system is adhering to pre-determined criteria of colleges of education is that all the applications are recorded. The third highest factor to the reliability of the system is adhering to pre-determined criteria of colleges of education is that each student's record is to be personally checked to ensure that he/she fulfils the requirements. The fourth highest factor to the reliability of the system is adhering to pre-determined criteria of colleges of education is the classification of students using a computerised selection system at colleges of education. The fifth highest factor to the reliability of the system is adhering to the pre-determined criteria of colleges of education is that the computerised selection system is reliable for admission anytime there is a new academic year for admission. The sixth highest factor to the reliability of the system is adhering to pre-determined criteria of

colleges of education is that the computerised selection system is reliable for admission any time there is a new academic year for admission.

The study also revealed that for independent of the candidate ranking, the concept of affirmative action specifically implements additional constraints had the highest factor as compared to other factors to the challenges in the use of the computerised system for admission into colleges of education. The second highest factor to the challenges in the use of the computerised system for admission into colleges of education is that the system forced some candidates initially selected to concede their place in the list to others far behind. The third highest factor to the challenges in the use of the computerised system for admission into colleges of education is the duplicate files. The fourth highest factor to the challenges in the use of the computerised system for admission into colleges of education is the duplicate files.

5.3 Conclusion

The results of the study concluded that the use of computerised selection for issuing admission letters after admission at the college of education in Ghana makes electronic sorting and selection of applications efficient. The electronic sorting and selection of computerised selection system are efficient in checking the application forms, for testing duplicate files, for verification of college requirements, verification of seat availability, for acceptance and producing acceptance documents manually, for distributions of admission letters. The electronic sorting and selection of applications are efficient to the extent that if the student is not accepted, the system goes to step-2 to repeat the procedures for other colleges. Also, if the student cannot be allocated to any college, the student may get conditional acceptance in any available college.

The study further concluded that the classification of students done by the computerised system is reliable, admission of graduate students from senior high school have been shown to improve the programme objectives of the computerised system for admission, each student's record is personally checked at ease with the help of the computerised system to ensure that he/she fulfils the requirements for the admission, with a computerised system for admission, shareholders can appoint auditors to work on capital funding in their interest, computerised system for admission tallied records of admission letters issued after admission and computerised system for admission are used to record all the applications during and after admission.

Furthermore, the study concludes that for independent of the candidate ranking, the concept of affirmative action specifically implements additional constraints. One of the challenges of a computerised system for admission is that the system forced some candidates initially selected to concede their place in the list to others far behind. Duplicate files and an online queue are two of the challenges in using a computerised system for admission into colleges of education affiliated to the University of Cape Coast. Lastly, there was a positive and high relationship between the efficiency of electronic sorting and selection of admission applications and the reliability of the computerised system. There was a weak negative relationship between the challenges of using a computerised system for admission and its' efficiency. Lastly, there was a negative and high relationship between the challenges of using a computerised system for admission and its' reliability.

5.4 Recommendations

The study does recommend that the Ministry of Education and Ghana education service should consider the challenges and help provide a more convenient, reliable, and efficient computerised selection system for the admission process at the college of education. Policymakers in education should make policies surrounding the admission process of students into the college of education to enhance its' ease of use by both the students and the institution. The study also recommends that a computerised selection system should be upgraded and updated to enhance its' efficiency and reliability. As a result of the efficiency and reliability of the computerised selection system, the study also recommends that the use of a computerised selection system for the admission process into schools should be promoted at the senior high school and tertiary institutions. Further studies should be done on the challenges students face with the computerised selection system when applying for admission into the college of education in Ghana. Also, studies can be done on the effective and efficient use of computerised selection system at the tertiary institutions in Ghana and different geographical area to add more to the literature on the use of computerised selection system for admission into schools.

REFERENCES

Addai-Mensah, I., Djangmah, J. S., & Agbenyega, C. O. (1993). *Family background and Educational opportunities in Ghana; (A critical look at the secondary school selection mechanism – the common entrance examination)*. Cape Coast: University Press.

Agyei – Twum, F. (2006). How computerised school placement has eliminated corruption, eased parents' anxiety. As retrieved on 21st August 2009 http://www.edughana.net/cssBP.hon

Ajayi, K. (2009). Strategic behaviour and revealed preferences; lessons from choice and student's placement in Ghana. Berkely: University of California.

Ajayi, K. F. (2011). School Choice and Educational Mobility: Lessons from Secondary School Applications in Ghana, Unpublished Working Paper.

Alcalde, J. and Romero-Medina, A. (2005). Sequential decisions in the college admissions problem, Economics LettersVol 86, pp. 153 - 158.

Ali, D., & Gupta, M. K. (2020). Advanced Deadline-Sensitive Scheduling Approaches in Cloud Computing. *In: Gao XZ., Tiwari S., Trivedi M., Mishra K. (Eds) Advances in Computational Intelligence and Communication Technology*, *1086*. Retrieved from https://doi.org/10.1007/978-981-15-1275-9_26

Allison, S. T., Goethals, G. R., Marrinan, A. R., Parker, O. M., Spyrou, S. P., & Stein, M. (2019). The Metamorphosis of the Hero: Principles, Processes, and Purpose. *The Art and Science of Heroism and Heroic Leadership*. Retrieved from https://doi.org/10.3389/fpsyg.2019.00606.

Ankomah, Y. A. (2016). Relevance of the Computerised Schools Selection and Placement System (CSSPS) in Ghanaian Schools. *Global Education Network*, 1–12. Retrieved from https://globaledunet.org/wp-content/uploads/2018/09/Paper-1-Ankomah-Latest-1.-2.pdf

Arpitha, K. (2020). A Study On Online College Admission Management System. *International Journal of Research in Engineering, Science and Management*, *3*(5), 3–5.

Babah, P. A. (2020). Computerized School Selection and Placement System in Ghana: Challenges and The Way Forward. *European Journal of Educational Sciences*, (2), 70–80. Retrieved from https://www.ceeol.com/search/article-detail?id=876817

Babah, P. A., Frimpong, A., Mensah, R. O., & Sakyi-darko, M. (2020). Computerized School Selection and Placement System in The Greater Accra Region of Ghana: Perception of Stakeholders. *Journal of Educational Psychology Researrch*, *2*(2), 1–15.

Bacchus, M.K. (1966). *Education for development and underdevelopment: Guyana's educational system and its implications for the third world.* Waterloo, Ontario., Canada: Wilfrid Laurier University Press.

Baht, B. A., & Bhat, G. J. (2019). Formative and Summative Evaluation Techniques for Improvement of Learning Process. *European Journal of Business & Social Sciences*, *7*(5), 1–10.

Baker, D., Bridges, D., Hunter, R., Johnson, G., Krupa, J., Murphy, J., & Sorenson, K. (2001). Guidebook to decision-making methods. Department of Energy, USA. Retrieved on 3 February 2019 http://emiweb.inel.gov/Nissmg/Guidebook_2002.pdf

Balellah, M., Burney, F., & Erana, A. (1995). A Computerized Admission Control System in King Abdulaziz University, Jeddahجامعة ي ل قبولك نظيهم ن ماج ا ل ي ل حاسبب مساعدةب جدة ل عزي ز عبد ل ملك. *Journal of King Abdulaziz University-Engineering Sciences*, *7*(1), 69–79. https://doi.org/10.4197/eng.7-1.6

Bashir, A. M. (2019). Applying the Institutional Theory at the Level of Halal Consumers : The Case of Cape Town in South Africa Applying the Institutional Theory at the Level of Halal Consumers : The Case of Cape Town in South Africa. *Journal of Food Products Marketing*, *25*(5), 527–548. https://doi.org/10.1080/10454446.2019.1607645

Beunza, D. (2019). Performative Work : Bridging Performativity and Institutional Theory in the Responsible Investment Field. *Research Gate Publication*, *40*(4), 515–543. https://doi.org/10.1177/0170840617747917

Bohanec, M. & Rajkovic, V. (1987). *An expert system approach to multi –decision-making*. Proceeding of IASTED International Conference "Expert Systems (ed. M.H Hamza) Act Press".

Buchanan, J. (2020). Digital Devices, Online Learning and All That: How They Are Shaping Education. *In: Challenging the Deprofessionalisation of Teaching and Teacher*, 189–208. Retrieved from https://doi.org/10.1007/978-981-15-8538-8_10

Chao, C.-Y., Hsu, H.-M., Hung, F.-C., Lin, K.-H., & Liou, J.-W. (2012). Total quality management and human resources selection: A case study of the national teacher selection in Taiwan. *Total Quality Management & Business Excellence*, *26*(1–2), 157–172. Retrieved from https://doi.org/10.1080/14783363.2012.733261

Chapman, A. K., Lehmann, C. U., Donohue, P. K., & Aucott, S. W. (2012). Implementation of computerized provider order entry in a neonatal intensive care unit: Impact on admission workflow. *International Journal of Medical Informatics*, *81*(5), 291–295. https://doi.org/10.1016/j.ijmedinf.2011.12.006.

Ciência, D. De, Moreira, R., & Figueiredo, E. (2019). Students Perception on the use of Project - Based Learning in Software Engineering Education. *In XXXIII Brazilian Symposium on Software Engineering*, 537–546. Retrieved from https://doi.org/10.1145/3350768.3352457

CSSPS Report, (2005). Computerized School Selection and Placement System. Accra: MOE (Ministry of Education)

Cumberbatch, H. (2020). Title If Given a Chance: A Study Exploring the Experiences of Former Academically Underprepared College Students in Trinidad and Tobago. *Electronic Thesis or Dissertation*. Retrieved from https://etd.ohiolink.edu/

Davey A., Olson D., & Wallenius J. (1994). "The process of multi-attribute decision making: A case study of selecting applicants for a PhD programme." *European Journal of Operational Research, 72*, 1994, p. 469-489.

Davydova, O., Kashchena, N., Staverska, T., & Chmil, H. (2020). Sustainable Development of Enterprises with Digitalization of the Economic Management. *International Journal of Advanced Science and Technology*, *29*(8s), 2370–2378. Retrieved from http://repository.hneu.edu.ua/handle/123456789/23535

De-Lisle, J. (2019). Insights on the Marginalization of Poor Children in the Education System of Trinidad and Tobago. In S. Blackman, D. Conrad, & L. Brown (Eds.), *Achieving Inclusive Education in the Caribbean and Beyond*. Retrieved from https://doi.org/10.1007/978-3-030-15769-2_6

Ebekozien, A., Abdul-Aziz, A.-R., & Jaafar, M. (2020). Unravelling the encumbrances in the low-cost housing computerised open registration system in Malaysia's major cities. *Property Management*, *38*(3), 325–343. Retrieved from https://doi.org/10.1108/PM-08-2019-0048

Ebel, R. L. (1972). *Essentials of educational measurement.* Engle-wood Cliffs, NJ: Prentice Hall, Inc.

Fang, C., Hsu, Y. S., & Lin, S. S. (2018). Conceptualising socio-scientific decision making from a review of research in science education. *International Journal of Science and Mathematics Education,* 1-22.

Foster, P.J., (1965). *Education and social change in Ghana*. London. Routledge and Kegan.

Gale, D. & Shapeley, L. S. (1962). *College admissions and the stability of marriage.* The American Mathematical Monthly, 59(1), 9-15.

Gamoran, A. & Nestrad, M. (1990). *Tracking instruction and achievement.* Paper prepared for World Congress of Sociology, Madrid Spain [13].

Germeijs, V., & De Boeck, P. (2003). Career indecision: Three factors from decision theory. *Journal of Vocational lBehavior, 62*, 11-25.

Glass, A., & Song, X. (2019). Planning Ahead : Using the Theory of Planned Behavior to Predict Older Adults ' Intentions to Use Hospice if Faced With Terminal Illness. *Journal of Applied Gerontology*, *38*(4), 572–591. https://doi.org/10.1177/0733464817690678

Glennerster, R., Kremer, M., Mbiti, I., & Takavarasha, K. (2011). *Access and Quality in the Kenyan Education System: A Review of the Progress, Challenges and Potential Solutions*.

Gök, E. (2016). The Turkish Higher Education System from the Kaleidoscope of Martin Trow. *Education and Science*, *14*(186), 147–168.

Grace-martin, M., Gay, G., & Ph, D. (2014). Web Browsing , Mobile Computing and Academic Performance. Web Browsing , Mobile Computing and Academic Performance. *Educational Technology & Society*, (January 2001). Retrieved from https://www.researchgate.net/publication/220374645

Grant, B. (1990). Student selection and placement in Turkish higher education. *The Vocational Aspect of Education*, *42*(133), 119–123. Retrieved from https://doi.org/10.1080/10408347308003591

Groen, M. M. van, & Eggen, T. J. H. M. (2020). Educational Test Approaches: The Suitability of Computer-Based Test Types for Assessment and Evaluation in Formative and Summative Contexts. *Journal of Applied Testing Technology*, *21*(1), 12–24. Retrieved from http://jattjournal.com/index.php/atp/article/viewFile/146484/103188

Grupe, F. H., & Maples, M. F. (1992). Preadmission Student Advising: A Prototype Computerized System. *NACADA Journal*, *12*(1), 42–47. https://doi.org/10.12930/0271-9517-12.1.42

Hallinan, M. T. (1997). The Sociological study of social change. *American Sociological Review* 62, 1-11.

Han, K.-T. (2009). Influence of Limitedly Visible Leafy Indoor Plants on the Psychology, Behavior, and Health of Students at a Junior High School in Taiwan. *Environment and Behavior*, *41*(5), 658–692. Retrieved from https://doi.org/10.1177/0013916508314476

Hansson, S. O. (2005). Decision theory: a brief introduction. The royal institute of technology. Department of philosophy and the history of technology, Stockholm. Retrieved from on 8 April 2013 http://www.infra.kth.se/~soh/decisiontheory.pdf

Hearns, J. C. (1984). The relative roles of ascribed and socio-economic characteristics in college destinations. *Sociology of Education*, 57 (13).

Hogarth, R. M. (2005). Deciding analytically or trusting your intuition? The advantages and disadvantages of analytic and intuitive thought. In: T. Betsch & S. Haberstroh (Eds.), *The Routines of Decision Making* (pp. 67-82). Mahwah: Lawrence Erlbaum Associates.

Hong, J., & Chang, N. (2004). Analysis of Korean high school students' decision-making processes in solving a problem involving biological knowledge. *Research in Science Education*, *34*(1), 97–111.

Husain, A., & Hidayatullah, A. (2019). Analysis and Design Of New Student Admission Systems On MTS AL MUHTADIIN. *Aptisi Transactions On Technopreneurship (ATT)*, *1*(2), 180–191. https://doi.org/10.34306/att.v1i2.86

Jonassen, D. H. (2012). Designing for decision making. E*ducational Technology Research and Development*, *60*(2), 341-359.

Kabara, P. (2020). *Lived Experiences with Inauthenticity of the Physician Assistant programme Admission Essay: A Phenomenological Study* (Concordia University). Retrieved from https://digitalcommons.csp.edu/cup_commons_grad_edd/459

Kirkiç, K. A. (2019). A Study on the University Placement System for Gifted Children in Turkey. *Journal of Education and Learning*, *8*(3), 59–68.

Kitchen, H., Bethell, G., Fordham, E., Henderson, K., & Li, R. R. (2019). The Turkish education system. *In OECD Reviews of Evaluation and Assessment in Education: Student Assessment in Turkey*, (10). Retrieved from https://doi.org/10.1787/71ee93b4-en.

Klarenbeek, S. E., Weekenstroo, H. H. A., Sedelaar, J. P. M., Fütterer, J. J., Prokop, M., & Tummers, M. (2020). The Effect of Higher Level Computerized Clinical Decision Support Systems on Oncology Care: A Systematic Review. *Cancers*, *12*(4). Retrieved from https://doi.org/10.3390/cancers12041032

Koomson, A. K., Brown. P. & Edjah. K. (2006) *Psychological Foundations of Education.* University of Cape Coast Centre for Continuing Education.

Kortland, K. (1996). An STS case study about students' decision making on the waste issue. *Science Education, 80*(6), 673-689.

Lee, H., & Witz, K. G. (2009). Science teachers' ınspiration for teaching socio-scientific ıssues: Disconnection with reform efforts. *International Journal of Science Education*, *31*(7), 931-960. https://doi.org/10.1080/09500690801898903

Lewis, K. O., Colombo, J., Lawrence, C., & Chandler, M. (2019). Strategies to Improve Learner Engagement and "Making Learning and Teaching Fun Again !" – Strategies to Improve Learner Engagement and Retention. *Presentations*, *15*, 2–81. Retrieved from https://scholarlyexchange.childrensmercy.org/presentations/15

Leyva-Lopez J.C., Fernandez-Gonzalez E. (2003). "A new method for group decision support based on ELECTRE III methodology", European Journal of Operational Research, 148, 14-27.

Liao, Q., Robert, X., Gurung, A., & Shi, W. (2015). Computers in Human Behavior A holistic understanding of non-users' adoption of university campus wireless network : An empirical investigation. *COMPUTERS IN HUMAN BEHAVIOR*, *49*, 220–229. https://doi.org/10.1016/j.chb.2015.02.044.

Lin, C., Broström, A., Årestedt, K., Mårtensson, J., Steinke, E., Pakpour, A. H., … Mårtensson, J. (2019). Using extended theory of planned behavior to determine factors associated with help-seeking behavior of sexual problems in women with heart failure : a longitudinal study. *Journal of Psychosomatic Obstetrics & Gynecology*, *0*(0), 1–8. https://doi.org/10.1080/0167482X.2019.1572743

Lipshitz, R., Klein, G., Orasanu, J., & Salas, E. (2001). Focus article: taking stock of naturalistic decision making—*Journal of Behavioral Decision Making, 14*(5), 331.

Lisle, J. De, & McMillan-Solomon, S. (2017). Using multiple methods to investigate eleven-year-olds' experiences of preparing for a high-stakes public examination in Trinidad and Tobago. *International Journal of Primary, Elementary and Early Years Education*, *45*(4), 397–418. Retrieved from https://doi.org/10.1080/03004279.2015.1095778

Lo, Y.-H. G. (2017). Reconceptualizing Curriculum Politics: A Case Study of an ESP programme for Vocational High School Students in Taiwan. *Taiwan Journal of TESOL*, *14*(1), 37–86.

Lunenburg, F. C. (2010). The decision making process. *National forum of educational administration and supervision journal, 27*(4), 1-12.

Małecka, M. (2020). The normative decision theory in economics: a philosophy of science perspective. The case of the expected utility theory. *Journal of Economic Methodology*, *27*(1), 36–50. Retrieved from https://doi.org/10.1080/1350178X.2019.1640891

Marnewick, C. (2012). The mystery of student selection: Are there any selection criteria? *Educational Studies*, *38*(2), 123–137. https://doi.org/10.1080/03055698.2011.567041

Mavrotas, G., & Rozakis, S. (2012). Application in a Students' Selection Problem Extensions of the PROMETHEE Method to Deal with Segmentation Constraints Application in a Students' Selection Problem. *Journal of Decision Systems*, *18*(2), 1–28. https://doi.org/10.3166/jds.18.203-229

Mensh, E. & Mensh, H. (1991). *The IQ methodology: Class, race, gender and inequality.* Carbonbale: Southern Illinois University Press.

Mirza, M. P., Hasnain, R., & Duke, K. B. (2018). Fostering Community-Academic Partnerships to Promote Employment Opportunities for Refugees with Disabilities: Accomplishments, Dilemmas, and Deliberations. *Societies*, *8*(3), 86. Retrieved from https://doi.org/10.3390/soc8030086

Muhangi, G. T. (2020). Delving into Undergraduate Students' Choice of Higher Education in Uganda. *Higher Education Marketing in Africa*, 79–105. Retrieved from https://doi.org/10.1007/978-3-030-39379-3_4

Muianga, X. J., Barbutiu, S. M., & Hansson, H. (2019). Teachers ´ perspectives on professional development in the use of SCL approaches and ICT : A quantitative case study of Eduardo Mondlane Xavier Justino Muianga , Sirkku Männikkö Barbutiu and Henrik Hansson Inocente Vasco Mutimucuio. *International Journal of Education and Development Using Information and Communication Technology*, *15*(2), 79–97.

Muigai, G. (2014). *A model for the adoption of information systems in the career guidance and university placement for high school students in Kenya*.

Mutashar, H. Z., & Mousa, A. H. (2020). A Study of Decadence, Romanticism, Resistance to Change, and Social Cataclysm in F. Scott Fitzgerald's "The Great Gatsby." *Journal of Talent Development and Excellence*, *12*(2). Retrieved from http://www.iratde.com/index.php/jtde/article/view/982

Neil, D. M. and Medina, N. J. (1989). *Standardised testing: Harmful to educational health:* Phi, Delta Kappan, 70, 688-697.

Oakes, J. (1990) *Multiplying inequalities*. *The effects of race, social class and tracking on opportunities to learn mathematics and science*. Santa Monica, CA: RAND Corp [13].

Olawoyin, R. O., & Eze, A. N. (2020). Business Education Students' Ratings of Financial Management and Customer Services Skills Needed For National Development in South-West, Nigeria. *International Journal of Educational Benchmark (IJEB)*, *15*(1), 1–9. Retrieved from https://benchmarkjournals.com/wp-content/uploads/2020/04/14-1.pdf

Olave, M., Rajkovic, V. & Bohanec, N. (1989). Computer-based support systems for nursery schools (in the Slovene language). *Ljubljiana "Joef Stefan Institute"*

Ozturk, N., & Altan, E. B. (2019). Examining Science Teachers ' Decisions about Nuclear Power Plants from the Perspective of Normative Decision Theory. *Journal of Education in Science, Environment and Health*, *5*(2), 192–208. https://doi.org/10.21891/jeseh.581739

Panchal, A. C. (2020). Formative and Summative Evaluation: Challenges and Remedy. *International Journal of Research*, *8*(3), 1–6.

Ratcliffe, M. (1997). Pupil decision- making about socio-scientific issues within the science curriculum. *International Journal of Science Education, 19*(2), 167-182.

Robinson, A. (1990). Co-operation or Exploitation? The argument against co-operative learning for talented students. *Journal for the Education of the Gifted*. 5, 13.

Sadker, M. P. and Sadker, D. M. (2000). *Teachers, schools and society* (6th ed) New York: Mcgraw- Hill, High Education Publications.

Shih, Y.-C., Chern, C., & Reynold, B. L. (2018). Bringing Extensive Reading and Reading Strategies into the Taiwanese Junior College Classroom. *Reading in a Foreign Language*, *30*(1), 130–151.

Sladek, R. M., Bond, M. J., Frost, L. K., & Prior, K. N. (2016). Predicting success in medical school: a longitudinal study of common Australian student selection tools. *BMC Medical Education*, *16*(187). Retrieved from https://doi.org/10.1186/s12909-016-0692-3

Svenson, O. (1996). Decision making and the search for fundamental psychological regularities: what can be learned from a process perspective? *Organisational Behavior and Human Decision Processes*, *65*(3), 252–267.

Tamakloe, E.K., Amedahe, F.K. & Atta, E.T (2005). *Methods and principles of teaching* Accra: Sedco Publishing Ltd. 161

Winn, M. (1985). *The plug-in-drug: television, children and family.* New York: Penvuin [5].

Wu, Y.-T., & Tsai, C. C. (2011). High school students' informal reasoning regarding a socio-scientific issue, with relation to scientific epistemological beliefs and cognitive structures. *International Journal of Science Education, 33*(3), 371–400.

Wu, Y.-T., & Tsai, C.-C. (2007). High school students' informal reasoning on a socio-scientific issue: Qualitative and quantitative analyses. *International Journal of Science Education, 29*(9), 1163–1187.

Yamamoto, G. T. (2006). University evaluation- selection: a Turkish case. *International Journal of Educational Management*, *20*(7).

Yeh, C.-H. (2003). "The Selection of Multi-attribute Decision Making Methods for Scholarship Student Selection." *International Journal of Selection and Assessment, 11*(4), 289-296.

APPENDIX A

QUESTIONNAIRE

Dear respondent, this questionnaire is designed to gather data about an evaluation of the computerised selection of students into Colleges of Education. a case study of Abetifi Presbyterian College of Education. This research project is conducted by a UEW-K Masters' student and your kind cooperation in this research is very much appreciated. Your anonymity and confidentiality are assured.

SECTION A: Your Personal Data

Please indicate your response to statements by ticking [√] the appropriate box.

1. Gender: Male [ ] Female [ ]
2. Qualification: (Highest): Diploma [ ] Bachelor's Degree [ ] Master's Degree [ ] others specify……..
3. Type of employment: Part time [ ] Contract [ ] Permanent [ ]
4. Work experience in this organization: Less than 3 years [ ] 3–7 years [ ] 8–15 years [ ] 15 years and above [ ]

SECTION B: The Efficiency of the Electronic Sorting and Selection of Applications

This category contains statements about the efficiency of the electronic sorting and selection of applications. Please indicate your level of agreement to the statements using the 7 point Likert scale below by ticking [√] the appropriate box:

1= Strongly disagree 2= Disagree 3= Slightly disagree 4= Neither agree nor disagree 5= Slightly agree 6 = Agree 7 = Strongly agree

S/N	Statement	1	2	3	4	5	6	7
1.	Issuing the admission letters after admission makes it efficient							
2.	Checking the application forms							
3.	Testing for duplicate files							
4.	Verification of the college requirements							
5.	Verification of seats availability							
6.	Acceptance and producing the acceptance document manually							
7.	Distributions of admission letters							
8.	If the student is not accepted he goes to step-2 to repeat the procedures for other college							
9.	If the student cannot be allocated to any college, the student may get conditional acceptance in any available college							

SECTION C: The Reliability of the System in Adhering to Pre-Determined Criteria

This category contains statements about the reliability of the system in adhering to pre-determined criteria. Please indicate your level of agreement to the statements using the 7 point Likert scale below by ticking [√] the appropriate box:

1= Strongly disagree 2= Disagree 3= Slightly disagree 4= Neither agree nor disagree 5= Slightly agree 6 = Agree 7 = Strongly agree

S/N	The system is reliable when ……..	1	2	3	4	5	6	7
1.	Classification of students is done							
2.	Admission of graduate students from senior high school are proven to enhance the objectives of the programme							
3.	Each student's record is to be personally checked to ensure that he fulfills the requirements							
4.	The computerized selection system is reliable for admission anytime there is a new academic year							
5.	Issuing the admission letters after admission, the record has again to be tallied							
6.	all the applications are recorded							

SECTION D: Challenges in the use of the Computerized System for Admission into Colleges of Education Affiliated to the University of Cape Coast

This category contains statements about the challenges in the use of the computerized system for admission into colleges of education affiliated to the University of Cape Coast. Please indicate your level of agreement to the statements using the 7 point Likert scale below by ticking [√] the appropriate box:

1= Strongly disagree 2= Disagree 3= Slightly disagree 4= Neither agree nor disagree 5= Slightly agree 6 = Agree 7 = Strongly agree

S/N	Statement	1	2	3	4	5	6	7
1.	The concept of affirmative action precisely implements additional constraints independently of the candidate ranking							
2.	The system force some candidates initially selected to concede their place to others far behind in the list							
3.	Duplicate files							
4.	Online queue							

Thank you.