

Original Research Article

CHALLENGES IN USING COMPUTERIZED SYSTEMS FOR ADMISSION INTO COLLEGES OF EDUCATION

Abstract

In most educational institutions, 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. However, university admission is no exception, but it is organized very differently throughout the world. Thus, the goal is to determine the challenges in the use of the computerized system for admission into colleges of education affiliated with the University of Cape Coast. The methodology for the study was a descriptive design with a quantitative method. The total population for the study was 255, with a sample size of 192 admission officers, quality assurance staff, and heads of departments. The results of the study show that one of the challenges of a computerized system for admission is that the system forces some candidates initially selected to grant their place in the list to others far behind. The study's findings discovered a negative weak association between the challenges of using a computerized system for admission and its' efficiency.

Keywords: colleges of education, computerized selection system, admission, students, efficiency.

1. Introduction

The rapid and ongoing advent of computers and data communications technologies have triggered drastic changes in the computerization processes of organizations and created a virtual Tower of Babel that information technology (IT) managers are struggling to decipher (Davydova, Kashchena, Staverska, & Chmil, 2020; Ali & Gupta, 2020). 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. 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 Clearinghouse ('ZVS') in Germany allocates students in specific subjects to universities with a lack of university places (Babah, Frimpong, Mensah, & Sakyi-darko, 2020). 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. 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, 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 the hearing, respectively (Gyane, Essah, Senior & Tetteh, 2021). Additionally, the cost of attending a private college of education in Ghana far outweighs that of public colleges of education (Muhangi, 2020). For example, while 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 a 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' being well-resourced in terms of human and physical capital compared to private education colleges, and the perceived educational quality and infrastructure at the public colleges of education add to their ever-increasing applications for admission (Olawoyin & Eze, 2020). Furthermore, 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 short code * 924 * 8 # from all networks: Vodafone Cash, Tigo Cash, MTN Mobile Money, and Airtel Money (Gyane, Essah, Senior & Tetteh, 2021). 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. Student test scores reflect the measures of their success and are thus a 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, process, or programme to form value judgments about the evaluated efficacy. Assessment is a process by which qualitative and quantitative data are analysed and obtained to decide on value or effectiveness value.

The assessment is also used to evaluate the consistency or shortcomings of a programme or system (Sladek, Bond, Frost, & Prior, 2016). There are 2 assessment types: a summative and formative 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. Summative evaluation systems include end-of-year, term, and semester exams administered in a variety of educational contexts and institutions (Panchal, 2020).

The West African Senior Secondary School Examination (WASSCE) is a summative assessment managed by the West African Examination Council (WAEC). To make critical educational decisions, summative or terminal assessment outcomes are used (Gyane, Essah, Senior & Tetteh, 2021). First of all, the summative assessment outcomes or results are used for credentialing or ranking students based on satisfactory programme and course completion (Baht & Bhat, 2019). Typical summative assessment roles in Ghana (Panchal, 2020) are qualification and grading at the end of tertiary, primary, and secondary education to attain the credential of diplomas, degrees, and certificates. 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 superior substitute to the manual selection and placement system during the study (Groen & Eggen, 2020). The summative portion of the survey relates to stakeholder evaluation of whether the CSS has accomplished its aims.

Furthermore, the admission of students from senior high school has proven to enhance the program's objectives (Ankomah, 2016). For example, because it brings unique perspectives that enrich students' experiences of education, the Committee of Admissions can recognise the value of a diverse student body. Various backgrounds may also vary in terms of academic records, the rural upbringing of students, and social, ethnic, and sex classifications (Marnewick, 2012). The affirmative action concept, 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 definitive multi-standards issue since they infringe the

alternatives' freedom that require some primarily chosen candidates to surrender their position to others far behind in the list (assuming a full pre-order). Thus, for the pupil problem of selection, a multi-criteria approach that can be consistent with the existence of segmentation constraints is required (Mavrotas & Rozakis, 2012). To improve the image of the decision-making process, Davey et al. (1994) studied the way of selecting applicants for a PhD course at universities in the United States. They found that in the presence of fuzzy or imprecise presence, models of non-compensatory that do away with the requirement to challenge the decision-maker with trade-offs concerning traits better handle imprecision, resulting in substitutes that are closer to decision-makers' intuitive favourites. Moreover, there have been several studies conducted on computerized selection systems at educational institutions (Grupe & Maples, 1992; Chapman, Lehmann, Donohue, & Aucott, 2012). Few studies have been conducted using college education as a reference (Gyane, Essah, Senior & Tetteh, 2021). The ultimate goal was to determine the challenges in the use of the computerized system for admission into colleges of education.

2. The aim

The study aims 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.

3. Research objectives

These are the objectives of the study.

1. To examine the correlation between the challenges of using a computerized system for admission and its' efficiency.

2. To assess the challenges in the use of the computerized system for admission into colleges of education affiliated with the University of Cape Coast.

4. A literature 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 a place in the "comfortable middle class" that is newly emerging. A successful senior high education has been shown to provide the ability to progress to university and thus a profitable 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 school availability is sufficiently broad to take in any school-going child, places in senior high school are small as only 5% of 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 (Addai-Mensah et al., 1993).

Likewise, Foster (1965) observed that senior high school education tends to be the most important thing in Ghana's entire education system. Addai-Mensah et al. (1993) 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, which was the topic of much public discussion, 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 courses studied at the basic elementary level 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 schools 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 percent, with the average national pass rate of 42 percent. Along with the fierce competition for admission to senior high school, the highly selective nature of the Standard Entrance Test has increased competition for high-level schools far beyond 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.

Addai-Mensah, et al. (1993) 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 at most colleges are the scores obtained during the CEE. However, the findings of Addai-Mensah et al. (1993) cast serious doubts about the explicit validity of 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. Addai-Mensah, et al. (1993) 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 opportunities to get their choice of senior high schools. From the debate, it is evident that Addai-Mensah, et al. (1993) 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' rankings of 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 ranging 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 1, 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 & 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 the 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 significantly reduced the phenomenon of placement delays; this statement was supported by 75 percent, 77.4 percent, and 80 percent of parents, SHS Heads, and GES/MOE employees, respectively.

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 gave 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 with 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 hold 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 assessments 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 MCB method.

5. The methodology

The methodology for the study was the quantitative method. The type of research design for the study was descriptive design. 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. Data for the study was obtained from both secondary and primary data sources. 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's 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.

5.1 The Population

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.

5.2 Sample Size and Sampling Method (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 by those particularly knowledgeable about the issues under study. 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). The researcher utilized stratified sampling to choose participants for the study in order to ensure that the sample size was representative. Because there were so many guys in the population, the majority of males were chosen for the study over females. The sample size was determined by calculating a fraction of males over the population ($157/255$) of the sample for men (118) and a fraction of females over the population ($98/255$) of the sample for females (74).

5.3 Instrument for Data Collection

The instrument for data collection was a questionnaire. 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. The questionnaire for the study was taken online through Google forms. 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 was 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.

6. Analysis and results

The analysis of the results reveals the challenges in the use of the computerized system for admission into colleges of education affiliated with the University of Cape Coast. To make the interpretation of the results easier, items in the questionnaire were coded before interpreting it. For example, items which ask what the challenges in the use of the computerized system for admission into colleges of education were coded as (Cape Coast Survey Abetifi College Education) CCSACE1, CCSACE2, CCSACE3, CCSACE4 (see Table 1 and explanation in the interpretations of the result).

Table 1: Descriptive Statistics for Research Question Three

	N	Min.	Max.	Mean	Std. Dev.	Skewness	Kurtosis		
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	S. E.	Stat.	S. E.
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 1, 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. Table 2 also reveals that the mean ranges from 2.8750 to 4.7031, indicating the distribution's center. The standard deviation (measure of dispersion) of the distribution, which represents the average distance a score is from the mean, ranged from 1.71382 to 2.07210. The skewness ranges from -.535 to .669, indicating that the variable is adequately normal. Items in CCSACE4 have a kurtosis of less than 0, indicating that they have fewer outliers than a normal distribution. CCSACE1, CCSACE2, and CCSACE3 have values greater than 1 but less than 2, indicating that there are fewer outliers and scores are more evenly distributed around the mean.

Table 2: 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, NA/D = Neither Agree nor Disagree, SLA = Slightly Agree, A = Agree, SA = Strongly Agree

Source: Researcher's Field Survey, 2020

For independent of the candidate ranking, fourteen respondents, representing 7.3%, strongly disagreed that the concept of affirmative action specifically implements additional constraints (CCSACE1); thirty-six respondents, representing 18.8%, disagreed that 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 the candidate A mean value of 6.5000 in Table 2 explains that respondents agreed that, independent of the candidate ranking, the concept of affirmative action specifically implements additional constraints (CCSACE1).

Table 2 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 2 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 2 shows that thirty-four respondents, representing 17.7%, strongly disagreed that duplicate files are one of the challenges in using a computerized system for admission into colleges of education (CCSACE3), forty-eight respondents, representing 25%, disagreed that duplicate files are one of the challenges in using a computerized system for admission into colleges of education (CCSACE3), twenty-two respondents, representing 11.5%, slightly agreed that duplicate files are one of the challenges in using a computerized system for admission into colleges of education (CCSACE3), thirty-eight respondents, representing 14.6%, disagreed that A mean value of 6.5000 in Table 2 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 2 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 2 explains that respondents agreed that the online queue is one of the challenges in using a computerized system for admission into colleges of education (CCSACE4).

6.1 Correlation Table

Table 3: Correlation for Testing Hypothesis

	Efficient	Challenges
Efficient	1	
Challenges	-.255**	1

Source: Researcher's Field Survey, 2020

From Table 3, it shows a negative Pearson Correlation of -.255. This 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. Moreover, 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 ($r^2 = .255^2 \cdot 100$). There was a weak negative relationship between the challenges of using a computerized system for admission and its' efficiency.

7. Discussion of Results

To achieve research objective two, the study sought 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, independent of the candidate ranking, the concept of affirmative action specifically implements additional constraints. The results are similar to those of Baht & Bhat (2019) and Chapman, Lehmann, Donohue, & Aucott (2012). Moreover, the results of the study show that one of the challenges of a computerized system for admission is that it forces some candidates initially selected to concede their place in the list to others far behind. The results are similar to those of Groen & Eggen (2020) and Grupe & Maples (1992). 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. The results are similar to those of Ankomah (2016). Lastly, the results of the study revealed that the 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 results are similar to those of Sadker & Sadker (2000). The findings of the study revealed that the results explained a 6.5% variation in the challenges of using a computerized system for admission in its efficiency ($r^2 = .255 \times .255 \times 100$). The findings are similar to those of Mavrotas & Rozakis (2012).

8. Conclusion

The results of the study concluded that, 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. The study's findings discovered a negative weak association between the challenges of using a computerized system for admission and its' efficiency.

Ethical Approval:

As per international standard or university standard written ethical approval has been collected and preserved by the author(s).

Consent

As per international standard or university standard, Participants' written consent has been collected and preserved by the author(s).

Suggestions

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. 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.

Reference

- 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.
- Ajayi, K. (2009). Strategic behaviour and revealed preferences; lessons from choice and student's placement in Ghana. Berkely: University of California.
- 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
- 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>
- 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 Research*, 2(2), 1–15.
- Babah, P. A., Mensah, R. O., Frimpong, A., Ofori, M. S., Mensah, L. O., & Ewusi, E. (2020). A Comparative Systematic Review of Computerized School Selection and Placement System in Some Selected Countries. *Journal of Popular Education in Africa*, 4(4), 86–117.
- 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.
- 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>.
- Davey A., Olson D., & Wallenius J. (1994). The process of multi-attribute decision making: A case study of selecting applicants for a Ph.D. program. *European Journal of Operational Research*, 72, 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>
- 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.
- 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>
- Gyane, S. O. J., Essah, R., Senior, I. A. A., & Tetteh, A. (2021). Reliability and Efficiency of Computerized Systems for Admission into Colleges of Education Affiliated with the University of Cape Coast. *Asian Journal of Research in Computer Science*, 12(4), 84-96.
- Koomson, A. K., Brown. P. & Edjah. K. (2006) *Psychological Foundations of Education*. University of Cape Coast Centre for Continuing Education.
- 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>
- 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
- 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>

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

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

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>

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

Zviran, M., Zviran, M., & Aviv, T. (2016). Select : A Decision Support System for Computer Family Selection SELECT : A. *Journal of Computer Information Systems*, 39(2), 101–112. Retrieved from <https://doi.org/10.1080/08874417.1999.11647398>