

Original Research Article

RELIABILITY AND EFFICIENCY OF COMPUTERIZED SYSTEMS FOR ADMISSION INTO COLLEGES OF EDUCATION AFFILIATED WITH THE UNIVERSITY OF CAPE COAST

Abstract

The automated selection system used by colleges of education affiliated to the University of Cape Coast 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. As a result, 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 type of research design for the study was descriptive design with a quantitative research method. The total population comprises of all admission officers, quality assurance staff, and Heads of departments at the colleges of education affiliated with the University of Cape Coast. The researchers' sample size for the study was one hundred and ninety-two (192). The questionnaire survey was carried out to collect data for the study. Quantitative analysis was done with the use of Statistical Package for Social Sciences. The results show that electronic sorting and selection of applications is efficient in checking the application forms, testing duplicate files, verifying college requirements, and verifying seat availability. The study revealed that 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.

Keywords: Computerised System, Selection, Sorting, Reliability, Efficiency and College of Education

1. Introduction

Organizations are 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, Zviran & Aviv, 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 (Ebekozi, 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). 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, Frimpong, A., Mensah, R. O., & Sakyi-darko, 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, 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 efficiency and reliability of computerized selection system used by colleges of education affiliated to the 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). 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.

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 (Ebekozi, 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 (Peterson et al., 2010; Chapman, Lehmann, Donohue, & Aucott, 2012). Few studies have been conducted using college of education. Moreover, no studies has been done on the reliability and efficiency of using electronic sorting and selection system for admissions into colleges of education. In order to bridge the gap in literature, the study sought to investigate the reliability and efficiency of computerized selection system at educational colleges affiliated with the Cape Coast University.

2. Aim

The study aims to investigate the extent to which the computerized selection system at educational colleges affiliated with the Cape Coast University has impacted the efficiency and reliability of the process, by evaluating the step by step stages in admission processes that are handled electronically.

3. Research questions

These questions will be addressed in the study;

1. What are the factors to the reliability of the system is adhering to pre-determined criteria of colleges of education?
2. What are the factors to the efficiency of electronic sorting and selection of admission applications at colleges of education?
3. What is the correlation between the efficiency and reliability of electronic sorting and selection of admission applications at colleges of education?

4. Literature review

4.1 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.

4.2 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

4.3 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).

4.4 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.

4.5 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.

4.6 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.

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.

5. Methodology

Quantitative methodologies were used in gathering data. The quantitative research enabled the researcher to develop questionnaires for the study (Grace-martin, Gay, & Ph, 2014). 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.

5.1 Population

Geographically, as said by Muianga, Hansson, & Barbutiu (2019), the study focused on computerised admissions at 46 colleges of education in Ghana. The population was the individuals or group to whom the survey relates. 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 comprises 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.

5.2 Design of the study

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 and reliability of the entire admission process. 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.

5.3 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. 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). (74).

5.4 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. 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.

6. Analysis and results

The analysis of the results presents the reliability and efficiency of the electronic sorting and selection of admission applications been at colleges of education. To make the interpretation of the results easier, items in the questionnaire were coded before interpreting it. For example, items on the efficiency of electronic sorting and selection of admission applications were coded as EESSA1, EESSA2, EESSA3, EESSA4, EESSA5, EESSA6, EESSA7, EESSA8, and EESSA9 (see Table 1). Moreover, items on reliability of computerized system at colleges of education in

adhering to pre-determined criteria were coded as RSAPC1, RSAPC2, RSAPC3, RSAPC4, RSAPC5, and RSAPC6 (see Table 1).

Table 1: Efficiency of electronic sorting and selection

	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 1, 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 1 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 2: Reliability of electronic sorting and selection

	N	Minimum	Maximum	Mean	Std.	Skewness	Kurtosis		
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std.	Statistic	Std.
					Deviation		Error		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 2, 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 2 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 3: Correlation for Testing Hypothesis

	Efficient	Reliable
Efficient	1	
Reliable	.675**	1

Source: Researcher's Field Survey, 2020

From Table 3, 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. Also, Table 3 shows that, 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 ($r^2 = .675 * .675 * 100$). Hence, 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.

7. Discussion of Results

To address research question one 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. The findings is similar to that of Klarenbeek et. al. (2020) and Davey, Olson & Wallenius (1994). 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. The findings is similar to that of Marnewick (2012). 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. The findings is similar to that of Mavrotas & Rozakis (2012). 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. The findings is similar to that of Panchal (2020) and Tamakloe, Amedahe & Atta (2005). 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. The findings is similar to that of Sladek, Bond, Frost & Prior (2016). 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 ($r^2 = .675* .675* 100$). The findings is similar to that of Sadker & Sadker (2000).

To address research question two 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. The findings is similar to that of Ankomah (2016). 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. The findings is similar to that of Babah (2020). 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. The findings is similar to that of Babah, Frimpong, Mensah & Sakyi-darko (2020). 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. The findings is similar to that of Baht & Bhat (2019) and Groen & Eggen (2020).

8. Conclusion

The results of the study revealed 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. Moreover, 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 study further revealed that the classification of students done by the computerised system is reliable. The study concluded that 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.

9. 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 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.

Reference

- Addai-Mensah, I., Djangmah, J.S., & Agbenyega, C.O. (1973). Family background and Educational opportunities in Ghana; (A critical look at the secondary school selection mechanism - the common entrance examination). Cape Coast: University Press.
- 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>
- Ajayi, K. (2009). Strategic behaviour and revealed preferences; lessons from choice and student's placement in Ghana. Berkely: University of California.
- 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.

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

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

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)

- 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.
- 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). Conceptualizing socioscientific decision making from a review of research in science education. *International Journal of Science and Mathematics Education*, 1-22.
- Gale, D. and Shapeley, L. S. (1962). *College admissions and the stability of marriage*. The American Mathematical Monthly, 59(1), 9–15.
- Germeijs, V., & De Boeck, P. (2003). Career indecision: Three factors from decision theory. *Journal of Vocational behavior*, 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>
- 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>

- 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>
- 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>
- 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.
- Jonassen, D. H. (2012). Designing for decision making. *Educational 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
- 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>

- Kortland, K. (1996). An STS case study about students' decision making on the waste issue. *Science Education*, 80(6), 673-689.
- Koomson, A. K., Brown, P. & Edjah, K. (2006) *Psychological Foundations of Education*. University of Cape Coast Centre for Continuing Education.
- Lee, H., & Witz, K. G. (2009). Science teachers' inspiration for teaching socio-scientific issues: 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.childrensmemory.org/presentations/15>
- 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.

- 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>
- 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 Mutimucuiio. *International Journal of Education and Development Using Information and Communication Technology*, 15(2), 79–97.
- 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.
- 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>
- 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
- 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.
- 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.
- 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>

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