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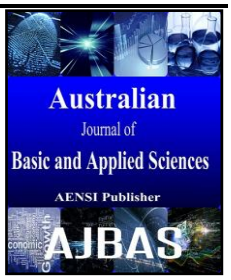

Perceptions of Students about the Registration Process: A Case Study in the University of Cape Coast, Ghana

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ABSTRACT

This study investigates factors that influence "Perception of students about the registration process on the University of Cape Coast Campus". A total of 500 students (undergraduates and post graduates) were sampled from seven places of residence. Quota sampling and simple random sampling were used in selecting students. The main objective of this research is to find factors students perceive to contribute to stress during registration process. The method used in analyzing the data was factor analysis with rotated factor solution. Based on the findings, period in which registration must last, competency of registration assistants and inadequate number of equipment for registration were the underlying factors that contributed most to stress during registration as students perceived.

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INTRODUCTION

Registration of students in the tertiary institution is an important task which takes the attention of students, registration officers and the academic officers. According to the oxford dictionary, "registration is the act of making an official record of something". Registration of students is done by every academic institution, starting from crèche through to the tertiary level. In other words it has become a tradition for every institution to undergo such process. Student registration deals with the registration of courses for the semester and also to make the institution (school) aware that a student has paid his/her fees and thus is a member of the institution (school).

Over the years, the registration at the University of Cape Coast has been in three categories namely;"Early registration, Normal registration and Late registration". As time went on the system of registration changed and instead of the three phases, only the normal registration was done and this was done within duration of one week. This has therefore created a room for problems and challenges during the registration process. Students have had to queue sometimes as early as 3am to be attended to (almost everybody wants to register earlier than scheduled creating congestion and delay), and one could spend more than six hours to get registered. This makes them see the registration process on campus stressful.

The aim of the study is to find the factors students perceive to contribute to stress during registration process on campus. Factor analysis which is one of the statistical techniques will be used in analyzing the data since it is helpful in extracting the underlying factors that do contribute to stress during registration process according to the perception of students.

Factor Analysis:

It is known to be a multivariate technique which reduces several variables to just few underlying unobserved variables called factors that are able to explain variation in the whole variables (observed) in the data (Stewart, 1981). Exploratory factor analysis deals with analyzing the data to find the intercorrelation among the variables and find the latent factors that account for the trend of linearity among these variables. On the other hand, confirmatory factor analysis tests the hypothesis as to whether the number of reduced variables (factors) is true or not(Henson and Roberts ,2006). For factor analysis to be carried out, one needs to access the sample size since it can affect the result of the analysis. In general, a large sample size of about 150 and above is quite appropriate for using factor analysis (Cabrera-Nguyen, 2010). Factorability of the intercorrelation matrix is also assessed by carrying out Bartlett's test of spericity as well as Kaiser-Meyer-Olkin (KMO) Measure of sampling adequacy

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which should be above 0.5 (Sharma, 1996). Some known extraction processes are Principal Component, Image Factoring, Principal factors, Maximum Likelihood Factoring, Unweighted Least Squares, Alpha Factoring and Generalized Least Squares(Williams *et al*., 2012). The Principal component analysis is the most commonly used factoring method. Each component forms a linear relation of the original variables with the new components uncorrelated among them(Davidson, 1975). Each component is expressed in the formula below,

$$y_i = b_{i1}x_1 + b_{i2}x_2 + \ldots\ldots + b_{ij}x_j + \ldots\ldots\ldots\ldots + b_{ik}x_k$$

$$y_i = \sum_{j=1}^{p} b_{ij}x_j$$

Where

y_i- are referred to as principal components

b_{ij}- is the weight of the j^{th}variable on the i^{th}component.

$x_1, \ldots, x_k$ – are the original variables

Several criteria must be checked before retaining factors. Some of these criteria are using Kaiser's criterion, Scree test (also known as elbow rule, i.e. component above the elbow of the scree plot are retained) and parallel test(Ledesma and Valero-Mora, 2007). Kaiser's criterion deals with retaining components with eigenvalue >1. Factor rotation is normally considered when the factors extracted do not show a clear pattern, thus the loadings on each factor is not high. There are a number of ways factor rotation can be done and these are, varimax, equimax, quartimax, orthogonal, and oblique rotation methods. The commonly used is the varimax rotation(Ruiz *et al*., 1990). The formula for the factors analysis is demonstrated below. Using p-variables and extracting q-factors which can explain the correlation among the p-variable the q-factor model becomes

$$x_1 = B_{11}f_1 + B_{12}f_2 + \cdots + B_{1q}f_q + \mathrm{e}_1$$
$$x_2 = B_{21}f_1 + B_{22}f_2 + \cdots + B_{2q}f_q + \mathrm{e}_2$$
$$\vdots$$
$$x_p = B_{p1}f_1 + B_{p2}f_2 + \cdots + B_{pq}f_q + \mathrm{e}_\mathrm{p}$$

Where

(e_i is the remaining (p − q)factors accounting for specific variance in x_i).

The value

$\sum_{j=1}^{q} B_{ij}^2$ is the communality of x_i

e_i

$= 1 - \sum_{j=1}^{q} B_{ij}^2$, is a measure of the specific variance

This technique is then used to assess the data and retain the underlying factors which contribute to stress as perceived by the students.

MATERIALS AND METHODS

Data collection:

The data was personally collected by researchers using questionnaires. The statistical and investigators research tools employed during the process of data collection were closed-ended questions (designed in statement form) which gave options for respondents to select from (i.e. whether they; strongly agree, agree, not sure, disagree, and strongly disagree with the question). Samples of five hundred (500) students (undergraduates and post graduates) were selected from the total population of students. Sampling method employed was quota sampling and simple random sampling. There were 26 variables used in the study which are presented in the table below. These are as follows: Queuing for registration is something we cannot avoid (X_1), the current period for registration is too short (X_2), sometimes courses I would like to register are unavailable (X_3), network connectivity is not reliable during the period (X_4), all registration procedures must be done under one roof (X_5), it is quite disturbing to link registration with payment of school fees (X_6), the venue for registration is not spacious (X_7), the registration assistants are untactful (X_8), it is a normal practice to link registration with payment of school fees (X_9), registration process should last till the middle of the semester (X_{10}), I usually do not know the courses to read until the registration period (X_{11}), it should be possible to register before student officially report to campus (X_{12}), it is important to make the output of the on-line registration as comprehensive as the manual registration (X_{13}), registration should end just before examination starts (X_{14}), most registration assistants lack requisite experience (X_{15}), the number of computers and accessories available for the process are too few (X_{16}), checking of payment of school fees is an important part of the registration process (X_{17}), whilst in a queue, chairs must be provided for students to sit (X_{18}), the current period for registration is just enough (X_{19}), on-line registration is a very convenient process (X_{20}), the start of the process is delayed most of the time (X_{21}), the registration process should be conducted throughout the semester (X_{22}), students should register in their various departments (X_{23}), payment of 70% of school fees before registration is convenient (X_{24}), status of fees payment should be made part of student on-line data for faster registration (X_{25}), the registration assistants are not fast enough during the registration process (X_{26}). All

the questions were coded after reviewing the responses and developing a code book. The data was processed using SPSS version 17and Minitab16.

Data Analysis:

Assessing Response:

Table 2: Percentage distribution of opinions on each of the indicator variables.

STATEMENT	1	2	3	4	5	STATEMENT	1	2	3	4	5
X_1	48.2	19.4	2.6	17.2	12.6	X_{14}	26.4	40.6	8.0	14.6	10.4
X_2	5.0	11.2	5.8	41.6	36.4	X_{15}	7.0	34.8	23.4	25.6	9.2
X_3	12.2	21.2	23.8	27.6	15.2	X_{16}	4.2	9.8	8.0	45.8	32.2
X_4	4.0	9.2	9.2	43.8	33.4	X_{17}	9.4	12.2	12.2	47.4	18.8
X_5	33.0	19.2	5.2	21.2	21.4	X_{18}	2.8	2.6	4.0	37.8	52.8
X_6	5.8	16.8	13.2	41.8	22.4	X_{19}	20.4	44.2	9.6	19.8	6.0
X_7	6.6	16.6	7.8	38.2	30.8	X_{20}	3.6	5.8	4.6	28.2	57.8
X_8	7.4	30.6	21.8	29.2	11.0	X_{21}	3.8	10.0	13.2	48.6	24.4
X_9	14.8	24.2	19.0	31.8	10.2	X_{22}	23.8	45.0	12.4	11.0	7.8
X_{10}	16.8	35.4	7.8	26.2	13.8	X_{23}	2.8	4.4	3.8	36.4	52.6
X_{11}	13.8	19.8	7.4	33.0	26.8	X_{24}	3.8	11.6	10.8	44.6	29.2
X_{12}	1.6	3.8	3.0	35.6	56.0	X_{25}	4.8	4.6	8.4	44.8	37.4
X_{13}	2.8	3.8	3.8	33.0	56.6	X_{26}	7.6	32.2	18.0	29.2	13.0

The numbers 1, 2, 3, 4, and 5 from table 2 represent the opinions of the students concerning the statements which are strongly disagree, disagree, not sure, agree, and strongly agree respectively. An examination of the distributions of responses on the variables indicates similarities of some groups of variables. It can be observed that distributions are similar for variables in each of the following sets

1. $[X_2, X_4, X_6, X_7, X_{11}, X_{12}, X_{13}, X_{16}, X_{17}, X_{18}, X_{20}, X_{21}, X_{23}, X_{24}, X_{25}]$
2. $[X_1, X_{10}, X_{14}, X_{19}, X_{22}]$
3. $[X_3, X_5, X_8, X_9, X_{15}, X_{26}]$

For any member in set 1 (exampleX_{12} : It should be possible to register before student officially report to campus) overwhelming majority of respondents were in favour of the attribute. Thus, group 1 is made up of statements about registration that are highly popular among students. In the second group, it is observed that for any member (exampleX_{14}: Registration should end just before examination starts) greater number of respondents disagree more than they agree on the statement. Thus, group 2 is made up of statements about registration that are highly unpopular among the students. In the third group, it is observed that for any member (exampleX_8: The registration assistants are untactful) as many respondents agree to the statement as disagree. In addition, quite a number of the respondents are not sure about the relevance of the statement about registration. Thus, group 3 is made up of statements about registration that are highly controversial among students. We wish to find the factors that influence the perception of students on registration of courses in making registration stressful. Before applying the factor analysis, we first examine these diagnostics such as the Kaiser-Meyer-Olkin Measure sampling (KMO) and the Bartlett's test statistics. That is checking if the data is suitable for factor analysis to be carried out.

Suitability of data for factor analysis:

Table 3 shows the result of the Bartlett's test of sphericity and selected results such as the Kaiser-Meyer-Olkin Measure sampling (KMO). The Kaiser-Meyer-Olkin value is quite high (0.682) which is above the recommended value of (0.5) (Wiley and Sons, 1996), and the Bartlett's test of sphericity is also significant with ($p<0.05$). Therefore it can be said that factor analysis is appropriate. We are now sure to proceed with the analysis.

Table 3: Results of Bartlett's test.

Measure	Value
KMO	0.682
Bartlett's test statistics	1669.93
Degrees of freedom	325
Significance	0.000

Eigen Analysis:

From table 4, it can be observed that each of the first nine components has Eigen value greater than one. The total variance explained by the first nine components recorded Eigen values above one which accounts for a total of 55.4% of variation. The amount of variation accounted by each component is given by its Eigen value. It can then be said that from the eigenvalue rule nine factors should be retained. This criterion is not enough for retaining nine factors hence scree test criterion (elbow rule) to further check if nine or fewer factors will be retained.

Table 2: Variance explained by each of the component.

Component	Eigenvalue	% of Variance	Cumulative %	Component	Eigenvalue	% of Variance	Cumulative %
1	3.13	12.06	12.06	14	0.81	3.10	72.73
2	2.01	7.72	19.78	15	0.79	3.03	75.76
3	1.69	6.50	26.28	16	0.75	2.88	78.64
4	1.60	6.14	32.42	17	0.71	2.72	81.37
5	1.47	5.64	38.06	18	0.66	2.53	83.90
6	1.24	4.77	42.83	19	0.65	2.49	86.39
7	1.14	4.38	47.21	20	0.60	2.29	88.68
8	1.08	4.14	51.35	21	0.58	2.22	90.90
9	1.05	4.04	55.39	22	0.53	2.06	92.96
10	1.00	3.83	59.21	23	0.50	1.93	94.89
11	0.98	3.77	62.98	24	0.49	1.87	96.75
12	0.88	3.40	66.38	25	0.45	1.73	98.49
13	0.85	3.25	69.63	26	0.39	1.52	100.00

Scree test Analysis:

In the diagram we look for the point after which the remaining parts begin to level off. It can be seen that this point falls on the sixth component that is the elbow point of the scree is on the sixth component. This means that according to the scree plot only six components may be retained to account for the correlation among the indicator variables. A plot of the components against their respective Eigen values is given in figure 1.

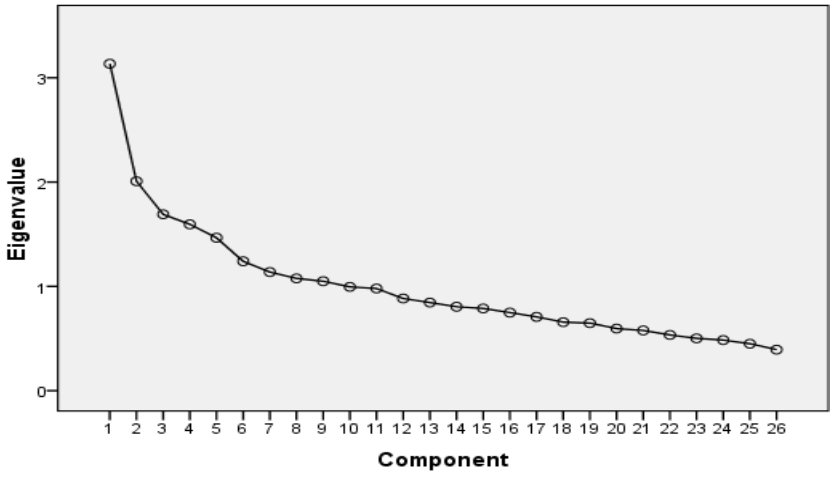

Fig. 1: Plot of component against Eigen values.

Factor extraction and interpretation:

From the Eigen analysis it has been observed that according to Eigen value greater than one rule, nine components may account for the correlation among the variables. The scree plot on the other hand, identified only six that may be used to account only for the correlation. Thus, the two rules of extraction of factors combined suggest that the number of factors to extract lies between six and nine.

Varimax Rotation of factors:

It can be observed from the rotation of the factors (cut off of 0.3) that three variables have high loadings on factor 1. These are variablesX_{10}, X_{14} and X_{22}. All of these three variables are concerned with the period that registration must last. Therefore factor 1 may be labeled as *duration* factor. Opinions of respondents on these three indicators suggest that students were not in favor of lengthy period of registration, thus factor 1 specifically represents short registration duration. On factor 2, it can be observed that three variables have high loadings on it. These variables are X_8, X_{15} and X_{26} are concerned with the competence of the registration assistants. Therefore factor 2 may be labeled as *competency* factor. Form the distribution of the attributes; respondents were very much divided on these attributes. Factor 2 shows that the competence of the registration assistants is highly debatable. Considering factor 3

two variables X_{16} and X_{18} load high on it. They are both concerned with registration equipment. Factor 3 can therefore be referred to as *equipment* factor. Factor 4 has two variables that load highly on it. These are $X_2$and X_{19}. They both are concerned with duration of the registration process. Like the first factor, the fourth factor is also a *duration* factor. Using the distribution of opinions on these indicators, the fourth factor suggest that students are not in favour of the current registration period is considered to be short. On factor 5, it can be observed that three variablesX_6, X_9 and X_{17}, have high loadings on it. All these variables are concerned with using school fees payment as a criterion/ prerequisite for registering students. Therefore factor 5 may be labeled as *fees-payment-criterion* factor. The distribution of the opinions on the indicator variables; X_6, X_9 and X_{17} shows students are generally in favour of using school fees payment as a criterion for registering students. Considering factor 6, variables X_{20} and X_{23} both have high loadings on it. That is the student gets registered at his or her own pace within the stipulated registration period. Therefore factor 6 may be labeled as *student-regulated process* factor. Factor 7 which is almost like factor 5 gives two variables with high loadings on it. These are variablesX_{24} and X_{25}. Therefore factor 7 may also be labeled as *fees-payment-criterion* factor. Factor 8 also has two variables with highloadings on it, these areX_3 and X_{11}. Both variables are concerned with student knowledge on courses. This can be labeled as *course- registration* factor. Factor 9 has two variables that load highly on it, these variables are X_1 and X_5. These two variables have no common thing they measure so quiet difficult to label it.

Table 6: Rotated Component Matrix.

Statement	Factor1	Factor2	Factor3	Factor4	Factor5	factor6	Factor7	Factor8	Factor9
X10	*0.77*	0.04	0.03	0.20	-0.08	0.11	0.06	0.09	-0.03
X14	*0.75*	0.09	0.07	0.13	0.10	0.07	-0.07	-0.05	0.09
X22	*0.80*	0.11	0.01	-0.06	-0.07	-0.11	0.06	0.06	-0.04
X8	-0.01	*0.74*	0.02	0.07	-0.02	0.02	0.00	-0.02	0.09
X15	0.15	*0.70*	0.25	-0.04	0.02	-0.06	-0.16	0.09	-0.03
X26	0.12	*0.72*	-0.02	-0.07	-0.06	0.14	0.08	0.10	-0.06
X12	0.03	-0.05	*0.48*	-0.05	-0.07	0.08	0.07	0.09	*0.41*
X16	0.04	0.26	*0.62*	0.18	0.13	-0.02	-0.12	-0.02	-0.12
X18	0.02	0.02	*0.59*	0.14	-0.09	0.17	0.10	0.02	0.23
X13	-0.07	-0.20	*0.45*	0.06	-0.03	0.16	*0.41*	0.08	-0.22
X21	0.04	0.26	*0.42*	-0.01	0.01	*0.36*	0.10	-0.22	-0.22
X7	0.19	0.22	*0.34*	0.20	-0.14	-0.14	0.05	0.18	-0.16
X2	0.13	0.02	0.16	*0.78*	0.00	-0.04	-0.01	-0.02	-0.18
X19	-0.16	0.08	-0.07	*-0.78*	0.05	-0.16	0.06	-0.02	-0.03
X6	0.10	0.10	0.31	0.18	*-0.52*	-0.41	0.24	0.07	0.05
X9	0.03	-0.04	0.06	-0.05	*0.79*	0.06	0.01	0.00	0.06
X17	-0.08	0.01	-0.05	0.06	*0.68*	-0.22	0.24	0.05	-0.10
X20	-0.01	0.08	0.14	0.07	-0.02	*0.64*	0.10	-0.13	0.04
X23	0.07	-0.01	0.07	0.08	-0.05	*0.57*	0.10	0.28	-0.02
X25	0.00	0.02	-0.08	0.02	0.15	*0.37*	*0.59*	-0.05	0.20
X24	0.05	-0.01	0.10	-0.06	0.04	0.01	*0.76*	0.00	0.00
X3	0.01	0.23	-0.13	0.13	-0.04	-0.09	0.09	*0.70*	-0.01
X4	-0.28	0.21	0.13	0.37	0.06	0.16	0.14	*0.35*	0.13
X11	0.15	-0.11	0.27	-0.19	0.08	0.11	-0.21	*0.66*	0.01
X1	0.04	0.07	-0.02	0.04	0.20	-0.04	-0.11	-0.15	*-0.62*
X5	0.05	0.10	-0.02	-0.05	0.18	-0.05	-0.06	-0.16	*0.65*

RESULTS AND DISCUSSIONS

From the analysis, 26 variables originally used variables were curtailed to only 9 factors. The nine factors extracted explained 55.4% of the variation among the variables. Factors 1, 2, 3, 4, 5, 6, 7 and 8 seem to measure duration of the registration process, competence of the registration assistants, registration equipment, duration of the registration process, using school fees payment as a criterion/ prerequisite for registering students, student-regulated process, fees payment as a criterion/ prerequisite for registering students and student knowledge on courses respectively. The 9th factor is not clear as to which common thing it measures, hence difficult to describe it or even give it a label. Factor 9 can then be removed since it measures no common thing.We realized that the 1st, 2nd, 3rd and 4th factors by their interpretation (opinion of students) influence directly the registration process as being for example stressful, since they may contribute to slow down the process. The 5th factor (which is labeled as fees-payment-criterion), however, does not seem to suggest how it influences the conduct of the registration process. Thus, even though this factor has emerged as part of the factor solution, the direction of its influence on the registration process is not clear. One main reason for this identification of a factor of this nature may be due to the manner of construction of the indicator variables on this factor. It can be seen that unlike the other indicators, the indicator variables on factor 5 may not have a direct

link on the actual conduct of the registration process, especially when respondents were generally in favour of them. The 5th factor therefore may be conveniently removed from the final factor solution. Likewise the 7th factor can be conveniently removed since it seems to measure the same thing. Also the 4th factor can be conveniently removed since it bears the same label as that of factor 1. Unlike factor 1, respondents are not in favour of a lengthy period for registration, for factor 4 respondents are also not in favour of a short period for registration. From these two factors we can assign the same factor label (duration factor), since they are both concerned with the period in which registration must last. The 6th and the 8th factors can also be removed from the final factor solution since they don't have direct influence on how stressful the registration process is. It has to do with students' personal attitude so not really a necessity to the cause of stress.

From the above, we overlook factors 4, 5, 6, 7 and 8 and conclude on extracting three factor solutions (*duration, competency* and *equipment* factors) since these factors influence the registration process by making it stressful for students.

Conclusion:

Nine factors were extracted to influence the perception of students about registration process of which three of them have been conveniently removed leaving six interpretable factors. The major factors are out of the six are Duration, Competency and Equipment. Other factors extracted but have no direct influence on the registration process are Fees-payment-criterion, student-regulated process and course-registration. Three most important factors highly influence the registration process which is period in which registration must last, competency of registration assistants and inadequate number of registration equipment. These highly influence the registration process thereby making the process very stressful.

Though six factors are considered to influence the perception of students on registration process, three of them are found making the process stressful for students. Therefore, the duration for registration should last for a period of one month, registration assistants should be more competent and more equipment should be provided to enhance the registration process.

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