

Binary Logistic Regression Analysis of Factors Associated With Unrest among Public Secondary School Students in Kenya

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Abstract— Student unrest witnessed in public secondary schools in Kenya especially in the second term is a threat to the education system. This study employed binary logistic regression analysis to analyze the factors associated with unrest among public secondary school students in Kenya. The dichotomous outcome variable was whether unrest would occur in a school or not. The selected explanatory variables were type of school, age, experience and leadership style of the principal. Data used in the study was collected from thirty principals in Bungoma, Kenya. The logistic regression model suggested that the coefficients of the principal's experience (1.567, $p=0.000$) and type of school (3.491, $p=0.000$) were statistically significant. The study recommended that promotion of teachers to management position should be based on experience.

Index Terms— Student unrest, Public Secondary Schools, Kenya.

I. INTRODUCTION

The youth bulge offers a country both opportunity and challenges. The youth are a country's future, and for that reason the Sustainable Development Goals (SDGs) recognize the role of youth in sustainable development. In the same breath, the achievement of a country's development agenda is contingent upon the engagement of the youth. Youth engagement in sustainable development efforts is central to achieving inclusive and stable societies. But, the contribution of youth to the development agenda by and large is dependent upon access and participation in quality of education. Unfortunately, the escalation in student unrest present a serious threat to education systems across the world. This has the potential of creating obstacles to youth participation in education.

Besides being an obstacle, student unrest can disrupt teaching and learning processes and cause inefficiency in the education system. For instance, student unrest in learning institutions is more often associated with truancy, wanton destruction of property, loss of life, high absenteeism and dropout rates. On the other hand, unrest increases the costs of education as parents are often asked to pay for the property destroyed. In the long run, student unrest affects the quality of education leading to poor learning outcomes. This in turn

affects the quality of human capital. In addition, students who engage in unrest may never fulfil their potential but instead become a burden to the society.

Sadly, student unrest is not confined to Kenya alone. It is a worldwide problem. Surprisingly, even the most developed countries with advanced education systems have their own share of student unrest. Empirical research suggests that student unrests in learning institutions are manifested in various forms. For instance, Ngwokabuenui (2015) observed that student unrest in Cameroon were manifested in the form of assault on teachers and fellow students, vandalism, cultism and mass protest. In some countries, student unrests have been witnessed at scale, often taking a political dimension. For example, a massive student unrest shook the French Republic that sent Charles De Gaulle and his Government packing.

In the USA, students once engaged in violent strikes to protest against the Spaniards Fascist regime of Generalissimo Franco while in Portugal students protested against the unpopular war in Portuguese, Guinea, Angola and Mozambique. In the Liberia 'rice riots' of 1979, most of those killed were students. In Ghana, in 1978, students were involved in violent riots; stoning and burning vehicles as well as boycotting classes

Nigeria too, has not been spared from student unrest. In the early nineties, incidences of student unrest were so rampant in that country to the extent that the military was deployed in schools to help calm the situation (Ndu, 2000).

The first case of student unrest in Kenya was reported in 1908 at Maseno School (RoK, 2001). Since then, student unrest has been on the rise both in frequency and intensity particularly during the second term. One of the worst incidences in the history of Kenya's education system was witnessed at St. Kizito high school when boys invaded girls' dormitory and in the process raped a number of girls. In this incidence alone, nineteen students lost their lives. Other disturbing cases of school student occurred in Nyeri High School and Kyanguli Secondary school where scores of students were burnt to death by their colleagues (Ministry of Education, 2001). But, there have been many other cases of unrest in other schools. In most cases there they led to massive destruction of school property, boycott of classes, rape, bullying and even killings.

There are various studies that have been conducted to uncover the underlying causes of unrest in schools. A study by Mutua (2010) reported a relationship between student unrest in schools and head teacher's variables namely;

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gender, level of formal education and experience as a teacher or head teacher. But the strongest association existed between students' unrest and head teacher's leadership style. Dinham and Scott (2008) found that school administrators who applied autocratic leadership style expected compliance from all concerned. Such leaders had a traditional conception of leadership based on obedience and respect for positional authority and tended not to negotiate or consult with the students or the community. Instead they expected their orders to be obeyed without question.

Mbiti (2007) blames student unrest and indiscipline on rigidity of the school administration. This finding is collaborated by a report of the Departmental Committee on Education and Research which hinted that the major causes of unrest among secondary school students in Kenya was overly strict treatment and lack of opportunity for students to express themselves (RoK, 2018). A study conducted by Waithaka (2008) on student unrest found that poor communication between teachers and students increased the odds of indiscipline among students in secondary schools. These findings imply that autocratic leadership style had a more likelihood of increasing student unrest in schools than democratic or participatory leadership styles. Muli (2012) reported that school administration, bad company, strict school rules, poor diet poor teacher student- relationship, too much free time given to students, dysfunctional families, inadequate teachers in schools, drug abuse and peer pressure were some of the causes of unrest in schools.

Other factors that had the potential of causing unrest in schools were; lack of proper guidance & counseling services and adolescence pressure. Sagini (1991) reported that the causes of student unrest in schools were drug abuse. The respondents attributed the effects of student unrest to staff demotivation, extra educational costs, student dropout and poor performance in national examinations.

II. STATEMENT OF THE PROBLEM

Student unrest being witnessed in public secondary schools in Kenya especially in the second term is a major cause of concern. Students have become rowdy and disrespectful to; teachers, school administrators and their colleagues. Incidences of unrest in schools include acts of arson, assault, mass protests, boycotting classes, rape and in worst cases murder. Several studies have been conducted to examine the underlying causes of unrest in schools, but the findings seem to be inconclusive and inconsistent. But as long as there is lack of consensus on the underlying causes of student unrest

in learning institutions, education systems will continue suffering even as they experience both internal and external inefficiency. This study therefore sought to determine the factors associated with student arrest in secondary schools in Kenya. The objectives of the study were to; to determine the relationship between principal's characteristics and unrest among secondary school students and to investigate the relationship between school type and unrest among secondary school students in Kenya.

III. METHODOLOGY

The study employed a descriptive survey design. Thirty schools were sampled randomly. Questionnaire were used for data collection. Questionnaires were administered online. Binary logistic regression was used to test hypotheses of the study. Data was analyzed using SPSS 25. The outcome variable was measured in terms of whether unrest occurred or not. A school where unrest occurred was coded '0' while the one where unrest did not occur was coded '1'. The explanatory variables were measured either on categorical or interval scale. They included; principals age in years, experience as a principal and gender.

A. Data Analysis

Thirty (30) respondents participated in the study. Descriptive statistics and binary logistic regression were used to analyze the characteristics of the sample and the factors associated with students' unrest. Binary logistic regression analysis is appropriate when investigating the relationship between a binary response and continuous or categorical explanatory variables. The binary regression model is often presented as:

$$\text{logit}(\pi) = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_p X_p \dots \dots \dots [1]$$

where $\beta_0, \beta_1, \dots, \beta_p$ are regression parameters; X_1, X_2, \dots, X_p are explanatory variables, and $\text{logit}(\pi)$ is the probability of student unrest.

IV. RESULTS AND DISCUSSIONS

Table 1 presents the descriptive statistics of the outcome variable.

Table 1. Summary statistics of the schools that participated in the study

Observed	Predicted Whether unrest has occurred		Percentage Correct
	No	yes	
Whether unrest has occurred	18	0	100.0
	12	0	0.0
Overall Percentage			60.0

Source (Researcher, 2021)

The results shown in Table 1 indicate that unrest had occurred in 18 of the 30 schools that were sampled. Table 2 presents the descriptive statistics of the explanatory variables that were measured on an interval scale.

Table 2. Descriptive Statistics of discrete variables used in the study

	N	Range	Min.	Max.	Mean	Std. Error	Std. Dev.	Var.
Experience	30	31	5	36	16.83	1.691	9.263	85.799
Age	30	30	30	60	49.37	1.686	9.234	85.275

Source (Researcher, 2021)

Table 3. Categorical Variables Coding

		Freq.	Parameter coding (1)
Leadership style	Participatory	17	1
	Non participatory	13	0
Gender	Female	14	1
	Male	16	0
Type of school	School has no boarding component	13	1
	school has boarding component	17	0

Age and experience were the continuous variables in the study. The maximum observed age was 60 years (Mean 49.37; Std. Dev. 9.234, Std. Error=1.686) and the experience of principals ranged from 5 to 36 years. Table 3 shows the descriptive statistics of the explanatory variables.

Source (Researcher, 2021)

The categorical variables used in the analysis were; leadership style of the principal (participatory= 1, Non

participatory =0; gender (Male=0, female=1 and type of school (school has a boarding component=1, school has no boarding component=0). The results presented in Table 3 indicate that 14(46.7%) of the respondents were male, 13(43.3%) of the schools had boarding component and 17(56.7%) of the secondary school principals applied participatory leadership style.

4.1 Binary logistic regression model

Table 4. Model summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	27.556 ^a	0.348	0.470

a. Estimation terminated at iteration number 5 because parameter estimates changed by less than .001.

Binary logistic regression analysis was performed to predict the factors associated with unrest in schools. The most common assessment of the overall model fit in binary logistic regression is the likelihood ratio test which is simply the chi-square difference between the null model (i.e. with constant only) and the model containing the explanatory variables. Table 4 shows that the -2log Likelihood statistics is 27.556. This statistic measures how best the model explains the unrest in schools, the smaller the statistic the better the model.

Source (Researcher, 2021)

The Cox and Snell or Nagelkerke R^2 is an analogous statistic in logistic regression to the coefficient of determination R^2 in linear regression, but not close analogy. The model summary provides some approximation of R^2

statistic in logistic regression. Cox and Snell's R^2 attempts to imitate multiple R^2 based on likelihood. The result of Cox and Snell R^2 shown in Table 4 suggests that 34.8% of the probability of student unrest occurring is explained by the four explanatory variables being investigated namely; type of school, gender and experience of the principal and type of leadership.

Logistic regression was performed to ascertain the effects of the principals' experience, age gender, leadership style and type on the likelihood of student unrest occurring. Results of a chi-square goodness of fit test are shown in Table 5.

Table 5. Omnibus Tests of Model Coefficients

	Chi-Square	df	Sig.
Step 1	Step	12.825	5
	Block	12.825	5
	Model	12.825	5

Source (Researcher, 2021)

The null hypothesis was that all intercepts and all coefficients were zero. With $\chi^2(5) = 12.825$, $p < .05$ the null hypothesis was rejected. It was then concluded that the model was good enough. Thus the study proceeded to build the full regression model. The results of the full binary logistic regression model are provided in Table 5.

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Table 6. Variables in the Equation

	B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I. for EXP(B)	
							Lower	Upper
Age	-0.763	4.134	0.034	1	0.853	0.466	0.000	1538.164
Experience	1.567	2.298	0.465	1	0.005	4.794	0.053	433.181
Type of school(1)	-3.491	1.312	7.086	1	0.008	1.030	0.002	0.398
Gender of principal(1)	1.036	1.082	0.916	1	0.339	0.817	0.338	23.488
Leadership style(1)	-0.052	1.026	0.003	1	0.959	0.949	0.127	7.097
Constant	-0.588	12.171	0.002	1	0.961	0.556		

a. Variable(s) entered on step 1: _age, _experience, type of school, gender of principal, leadership style
Source (Researcher, 2021)

The full regression model can now be expressed as:

$$\text{logit}(\pi) = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_p X_p \dots \dots \dots [1]$$

We can go one step further to fit the explanatory variables into the model;

$$\text{Logit (probability of student unrest)} = \beta_0 + \beta (\text{age}) + \beta_1 (\text{experience}) + \beta_2 (\text{type of school}) + \beta (\text{gender of principal}) + \beta (\text{leadership style}) \dots \dots \dots [2]$$

When all coefficients are fitted into the full regression model shown in [2] above we get that;

$$\text{The probability of student unrest} = -0.588 - 0.763(\text{age of the principal}) + 1.567 (\text{experience of the principal}) - 3.494(\text{gender of the principal}) - 0.052 (\text{leadership style}) \dots \dots \dots [3]$$

From the results presented in Table 6 we can observe that the coefficients of the principal's experience (1.567, $p=000$) and type of school (3.491, $p=000$) were statistically significant. The odds ratio or Exp(B) for the principal's experience was 4.794 while that of type of school is given as 1.030. This tells us that student unrest was 1.030 times more likely to occur in schools with a boarding component than in schools without a boarding component and that student unrest was less likely to occur in a school with a more experienced principal.

The findings of this study regarding the association of type of school and student unrest confirms fears that have been held by some stakeholders who have in turn called for abolition of boarding schools as a way of arresting student unrest (KNUT, 2020). However, even if this argument sounds plausible, we should not rush without considering the implication of such a decision on equity in access to education. Such an action should only be taken once measures are put in place to ensure that day schools have adequate teaching and learning resources. Otherwise as it is today, students in boarding schools continue to enjoy better facilities as opposed to their counterparts in day schools.

Furthermore, as we engage in the discourse on whether or not to abolish boarding schools, we must have a clear view of the implications on national cohesion and integration. Abolishing boarding schools would mean that students can only be admitted to schools within their localities thus limiting them from interacting with students from other parts of the country.

The results presented in Table 5 also suggest that the probability of occurrence of unrest was low in schools that were headed by more experienced principals. This finding is quite important concerning promotion of teachers. Currently, promotion is based on Career Promotion Guidelines (CPG) other than teaching experience. TSC's decision to conduct promotions based on CPG has been a subject of contention between the teachers' employer and union for some time now. This has seen teachers who have been in the teaching profession for a shorter time being promoted to managerial positions at the expense of the more experience ones. The findings of the study probably imply that that the escalation in student unrest was occasioned by inexperienced school administrators.

To a large extent, these findings concur with previous studies. Mutua (2010) reported an association between student unrest in schools and head teacher's variables namely; gender, level of formal education and experience as a teacher or head teacher. But the strongest association existed between students' unrest and head teacher's leadership style. However, there was a departure of the current study from those reported by other studies in the sense that the current study found that unrest was more likely to occur when the principal applies participatory leadership style. Denham and Scott (2008) found that school administrators who applied autocratic leadership style expected compliance from all concerned. Such leaders had a traditional conception of leadership based on obedience and respect for positional authority and tended not to negotiate or consult with the students or the community. Instead they expected their orders to be obeyed without question. Mbiti (2007) too blamed student unrest and indiscipline on rigidity of the school administration.

V. CONCLUSION

The binary logistic regression model suggested that the odds to occurrence of student unrest increased with type of school. Schools with a boarding component had the highest chance of experiencing student unrest.

VI. RECOMMENDATIONS

From the findings of the study and conclusions thereof, the study recommends that;

- Since the probability of student unrest was lower in schools that were managed by more experienced

principals, TSC should consider promotion of teachers to management position based on experience.

- (ii)Based on the findings of study, there is need relook at the policy on boarding schools in Kenya.

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