Effects of Belt Marking in Internal Joint Examination on Final KCSE National Examination Performance in Extra-County Secondary Schools, in Murang'a County, Kenya

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Abstract: **- The study sought to investigate effects of conveyor belt marking in internal joint examination toward KCSE national examination performance in extra-county secondary schools, in Murang'a county, Kenya. The study employed descriptive survey design with both qualitative and quantitative approaches targeting 23 school principals and 4815 students. A sample of 168 respondent was randomly selected for the study findings. Data was mainly collected using a questionnaire tool. The study established that the whole process of belt marking ensured that all students from extra-country secondary schools were awarded the correct marks, scores, grades and awards based on their performance. Majority (78.26%) of the extra-county school mean performance were between grade C minus and grade D plus. Most students did not perform well since the whole process of marking ensured the assessment in reliable and valid. Majority (80.75%) of the students managed a grade C plain and below in the joint exam that was marked under conveyor belt system. All the schools improved in KCSE examination where majority (60.87%) scored grade C plain which is a better and higher grade in national examination performance and none of the school performance below grade C plain a clear indicator that conveyor belt marking had an impact in this performance as compared with previous years, where schools were using traditional marking system. Quality grades improved by 29.456% and poor grade reduced by 34.77% from the joint examination and 2306 secured a degree program in the university. There was a positive correlation between joint examination and KCSE examination performance after adoption of conveyor belt marking a replacement of traditional marking. Students felt that belt marking would protect them from those teachers who are biased and unfair in their marking and therefore, CBS increases the efficiency and accuracy in performances.**

Key words: **Consistency, Conveyor Belt Marking (CBM), Conveyor Belt System (CBS), Traditional marking system. KCSE national examination.**

I. INTRODUCTION

Assessment is important in evaluating learners in the teaching process through assignment and examination. Many students cry foul especially when they did not perform well in the final National examination. Marking is one of the processes that ensure that the assessment is reliable and valid (Alias, 2005). In Kenya, the Government has introduced belt marking especially in National examination and this has eliminated remarking of scripts and also bias (halo effect). The Kenya National Examination Council (KNEC) introduced conveyor belt marking to counteract the traditional marking, where each script was marked by one marker which led to hasty and sloppy marking as the markers were paid according to the number of scripts they marked. With the introduction of conveyor belt marking, it ensured reliability, where the markers were trained and sat for the examination, they were going to mark in order to judge their content level (Munyumba and Mutwiri, 2009). Conveyor belt marking involves organizing markers into groups in which each marker is assigned a question(s) to mark by the team leader (Bukenya, 2006). This removes the influence of one marker on the script (Pinat de Moira, 2011; Spear, 1996).

In conveyor belt marking, markers are placed in teams by the chief examiner under the supervision of the Team Leader. The Team leader selects some scripts for the moderation to check adherence to the marking scheme. A marker exceeding a greed deviation depending on the subject could be asked to do a remarking. After marking transcript checkers, check for errors on the marked scripts as well as transcription of marks onto the mark sheets. After the marker has completed marking, the marks are entered on the mark sheets in the examination analysis software for grading and publication of results. The suit for National examination in Kenya includes Kenya Certificate of Secondary Education and Kenya Certificate of Primary Education. The results of these exams are used as entry "tickets" for higher education training or employment opportunities. It is therefore essential that these National examinations be marked as accurately as possible, to ensure fair results for all. The Kenya National Examination Council administers these national exams at the end of a cycle which are uniform throughout Kenya irrespective of region or cultural/urban divide (Sessional paper No 14, 2021).

Murang'a county Extra County schools borrowed the same from Kenya National Examination Council in marking the joint internal exams, that is done by Extra County Schools

(ECS) within the county. CBS has really improved validity and reliability of students' examination results, therefore, promotes efficiency and accuracy in performance, which is a true reflection even in their final KCSE national examination. Aslett (2006) explained the advantages of the psychology of intra and inter-rater reliability in increasing reliability and that is adopting conveyor belt marking in examinations.

A. Statement of the Problem

There are challenges in the traditional marking of examination in secondary schools set up, where teacher is familiar with the students. The students often complain of foul play, favoritism and unfairness on the part of the teachers especially where the candidate has failed or obtained lower grades. School examinations are routinely designed and administered by teachers to assess students learning capabilities. Output from those examination is often used to support decision making such as joining the next level of education. The researcher had noted that when two or more teachers are teaching the same form after administering a common examination to assess students' achievement, they should employ conveyor belt marking for a common ground, which creates a good basis for an improvement especially in final examination where belt marking is mandatory.

B. Purpose of the study

The purpose of the study is to examine the effects of belt marking in internal joint examination on KCSE national examination performance in extra-county secondary schools in Murang'a county, Kenya.

C. Objective of the study

i) Determine the effects of belt marking in internal examination on final KCSE national examination performance, in extra-county public secondary schools in Murang'a County.

D. Research Question

i) What are the effects of belt marking in internal examination on final KCSE National Examination performance, in Extra-County public secondary schools in Murang'a County?

E. Hypothesis

i) Conveyor belt marking in internal examination improve the performance of National examination.
ii) Conveyor belt marking improves the validity and reliability of the student examination results in both internal and National examination.
iii) There is much correlation between internal and National examination results with conveyor belt marking.

II. LITERATURE REVIEW

A mark is a score awarded to a candidate by an examiner based on his/her judgement (Ofqual, 2011). In traditional marking, the system involves one marker marking the whole script or Centre. Each marker is assigned scripts to mark by the subject manager or marking supervisors (Bukenya, 2006). The process starts with the chief examiner or senior examiners developing questions papers and marking guides. The senior examiners train their markers how to apply the marking scheme (Ofqual,2011; Ofqual, 2013). Consistency in the application of marking scheme ensures reliability in the marking process (Chamberlain and Taylor, 2010). Markers are placed into teams by the chief examiner under the supervision of the Team Leader, where the team leader selects some scripts for moderation to check adherence to the marking schemes. A marker exceeding agreed deviation depending on the subject could be asked to do the remarking.

According to Bukenya (2006), in the CBS examiners are organized in groups. Each group is composed of a team leader, a starter, markers and checkers. Each marker marks only a set of questions and possess the candidates answer scripts to the next marker who will also just mark the set of questions allocated to him/her. The marked scripts are passed over to the checkers, who are also examiners, to check through the script for any errors. Any errors detected are referred immediately to the markers to correct. Finally, the team leader sample 10 percent of the scripts in an envelope and remarks to assess the consistency in the marking and interpretation of the marking scheme. Based on Okelowange's (2004) experimental results, CBS was piloted in PLE marking of the year 2003 and the examiners were happy with CBS and recommended that it should be adopted in marking all PLE scripts with the effect from 2004 (Okelowange, 2004). Ofqual, (2011) argued that the belt supervisor can allow markers to select questions to mark which they are comfortable with and then decide what to do with the remaining questions if any according to their personal values. This is important in that markers would mark those questions they have knowledge, mastery of content and the marking guide and allocating demanding and most challenging questions to each of the markers. The reminder should then be distributed accordingly as determined by number of questions each marker is going to mark.

In Rwanda, the Government has introduced belt marking, where each belt marking team consists of five (5) members. This has eliminated remarking of scripts. The National Examination Council of Rwanda, indicated that in the past traditional marking in which each script was marked by one marker led to hasty and sloppy marking as the markers were paid according to the number of scripts they would have marked (Rwanda Focus, 2009). Conveyor belt marking in Tanzania, among other reasons was adopted to reduce the time for marking, queries and biases by markers (East African Community Meeting of Secondary Education Examination Report, 2010)

III. RESEARCH DESIGN AND METHODOLOGY

3.1 Research design

The research design adopted for this study was quantitative and qualitative design. The blending of qualitative and quantitative design. The blending of qualitative and quantitative methods in this study neutralized bias, sought convergence of results and produced final product which highlighted the significant contribution of both approaches, where both uses numeric and word data easily.

3.2 Target Population

The sample size for the study comprised of school principals and form four students. The population included 4815 students and 23 school principals from extra-county secondary schools in Murang'a county. The total target population was 4838 respondents.

3.3 Sample size and Sampling procedure

In this study stratified random sampling was employed. The whole population was used for the school principals and 145 students from extra-county secondary schools. According to Mugenda and Mugenda (2003) a sample of 30 percent will be appropriate in social science study.

3.4 Research Instruments

The data collection instrument includes questionnaires administered to school principals and students in the extra-county secondary schools. The questionnaire items comprised of both close ended and open-ended questions, as well as matrix items that gave the advantage of collecting both qualitative and quantitative data, in addition to generate maximum information. Questionnaire was to collect data on the examination performance for both internal joint examination and KCSE national examination for students by the school principals and also suggestions from students regarding conveyor belt marking and traditional marking of exams.

3.5 Data Analysis technique

The Scientific Package of social sciences (EPSS) computer package version was used to analyze data related to the objective. Qualitative data was analyzed by use of mean, the ranges and percentages. Descriptive statistics gave general opinion with regard to effects of conveyor belt marking on examination performance. Correlation analysis was done to establish the relationship between the two examination performances.

IV. RESULTS AND DISCUSSION

A. Murang'a Extra County Joint Exams Performance

Secondary schools Principals from Extra- County schools in Murang'a county were asked to give the examination analysis of joint internal examination which was marked under conveyor belt system and the findings is in Table 1.

Table 1. Murang'a Extra County Joint Exams Performance

	SCHOOL	ENT	A	A-	B+	B	B-	C+	C	C-	D+	D	D-	E	MSS	MG
1	Kahuhia girls	257	0	1	4	22	48	69	64	29	16	3	1		6.69	C+
2	Kiaguthu boys	221	0	0	4	7	26	45	64	62	13				6.21	C
3	Gaichanjiru boys	180			4	14	26	28	35	38	23	8	3	1	6.07	C
4	Mumbi girls	212				11	18	40	44	52	30	14	2	1	5.73	C
5	Kiria-ini Girls	266			5	8	20	38	64	63	40	26	2		5.60	C
6	Kangema high	197			2	3	9	35	40	49	36	19	4	0	5.37	C-
7	Kamahuha Girls	286				5	19	31	62	88	52	24	3	2	5.29	C-
8	Nyagatugu Boys	97			2	5	9	10	14	16	17	21	3		5.24	C-
9	Nginda Girls	181				3	7	16	40	62	39	13	1		5.20	C-
10	Githunguri Girls	223			1	2	9	26	46	64	48	20	4	3	5.12	C-
11	Githumu Boys	210			1	1	5	23	40	53	60	20	7		4.95	C-
12	Njumbi boys	230				2	8	26	41	46	49	44	13	1	4.76	C-
13	Ruchu Girls	210		1		4	5	16	39	51	43	38	12	1	4.76	C-
14	Ng'araria Girls	194			1	4	2	17	26	53	55	27	9		4.75	C-
15	Gatanga Girls	241				3	9	21	34	66	58	36	9	5	4.74	C-
16	Gituru high	183				5	2	14	23	46	36	33	19	5	4.44	D+
17	Gitugi Girls	229				1	4	15	34	48	69	35	20	3	4.42	D+
18	Weithaga Boys	202				2	4	15	25	48	44	41	19	4	4.39	D+

19	Kibutha Girls	187				3	7	10	18	42	48	36	18	5	4.34	D+
20	Kirogo Boys	123				1	4	8	10	25	31	29	14	1	4.24	D+
21	Naaro High	142				1	1	5	15	26	42	35	16	1	4.07	D+
22	Kianderi Girls	156				1	1	5	15	29	38	39	21	7	3.88	D+
23	Kirwara High	289			1		8	9	29	42	66	73	49	12	3.85	D+
	Total	**4716**	**0**	**2**	**25**	**108**	**251**	**522**	**822**	**1098**	**953**	**634**	**249**	**52**		

From **Table 1** majority of the schools (43.48%) scored grade C minus, (34.78%) scored grade D+, (17.39%) scored grade C plain and minority (4.35%) scored grade C plus. This is a clear indicator that a conveyor belt marking is very thorough therefore, majority (78.26%) of the extra-county school's mean performance were between grade C minus and grade D plus. Most students did not perform well since the whole process of marking ensured the assessment is reliable and valid. Pinot de Moira (2011) suggests involving many markers per script as one way of achieving marking reliability. Therefore, the whole process of belt marking ensured that all students from the extra-county secondary schools were awarded the correct; marks, scores, grades and awards based on their performance. Hence giving a clear picture of where the candidates are and where they were expected them to be, when they sit for KCSE national examination.

After the students sat for the Extra- County joint examination only 19.25% managed to score grade C plus and above which the entry grade to the university, but majority (80.75%) managed a grade C plain and below. Therefore, the performance of this joint examination gave students good platform to know; where they are in terms of performance, the mistake they have been doing when answering questions in exams and the corrections they needed to adopt and the effort needed in revision before they sat for the final KCSE national examination. The students felt that belt marking gave them a clear picture of where they are in performance, since the marking minimized malpractice, resulting in high degree of fairness in the marking process. Even if majority of students did not perform well in this joint examination but they were satisfied with their grades since they felt that conveyor belt marking increases the efficiency and accuracy in performances.

B. Murang'a Extra County public secondary schools 2020 KCSE performance

Secondary schools Principals from Extra-County schools in Murang'a county were asked to give the examination analysis of KCSE national examination which was done by their schools and marked under conveyor belt system at the national level and the findings is in Table 2.

Table 2. Murang'a Extra County public secondary schools 2020 KCSE performance

	SCHOOL	ENT	A	A-	B+	B	B-	C+	C	C-	D+	D	D-	E	MSS		MG
1	Kahuhia girls	257	0	12	52	61	57	44	24	7					8.34		B-
2	Kiaguthu boys	222	1	11	21	44	45	42	49	9					7.80		B-
3	Gaichanjiru boys	194	0	5	20	33	27	40	42	14	8	4	0	0	7.33		C+
4	Mumbi girls	212	0	4	15	35	42	67	29	18	2	0	0	0	7.48		C+
5	Kiria-ini Girls	268	0	9	20	31	44	64	58	32	7	3	0	0	7.18		C+
6	Kangema High	199	0	4	12	28	41	45	40	21	6	1	1	0	7.20		C+
7	Kamahuha Girls	286	0	0	10	36	49	61	87	36	11	1	1	0	6.83		C+
8	Nyagatugu Boys	113	0	3	3	14	12	14	19	26	21	1	0	0	6.32		C
9	Nginda Girls	182	0	2	1	11	18	45	44	43	14	4	0	0	6.25		C
10	Githunguri Girls	223	0	1	4	19	24	48	67	43	11	3	0	0	6.46		C
11	Githumu Boys	210	0	0	6	19	31	45	49	39	19	6	0	0	6.44		C
12	Njumbi boys	230	0	1	16	29	45	47	55	24	12	1	0	0	7.05		C+
13	Ruchu Girls	211	0	2	5	13	25	47	64	34	18	3	0	0	6.41		C
14	Ng'araria Girls	196	0	2	5	13	29	39	57	32	15	4	0	0	6.47		C
15	Gatanga Girls	243	0	1	7	8	31	43	58	61	29	4	1	0	6.11		C
16	Gituru high	189	0	0	4	4	8	29	50	49	22	19	2	1	5.52		C
17	Gitugi Girls	231	0	0	7	25	30	48	66	38	13	4	0	0	6.58		C+

18	Weithaga Boys	202	0	0	6	9	22	41	52	38	21	11	2	0	6.07		C
19	Kibutha Girls	188	0	0	4	8	14	30	54	46	23	4	1	1	5.92		C
20	Kirogo Boys	134	0	1	3	9	7	22	33	31	21	7	0	0	5.90		C
21	Naaro High	143	0	0	1	1	8	11	25	44	37	13	3	0	5.03		C
22	Kianderi Girls	160	0	0	1	0	4	14	29	43	37	25	5	0	4.82		C
23	Kirwara High	292	0	2	6	16	15	36	63	69	45	34	6	0	5.53		C
	Total	4716	0	2	25	108	251	522	822	1098	953	634	249	52			

From **Table 2**. All the schools improved in the KCSE examination performance from the joint extra-county examination. Majority of the schools (60.87%) scored grade C plain which is a higher grade in national examination performance and none of the school performed below grade C plain a clear indicator that after adopting belt marking all the schools improved. (8.70%) of schools scored grade B minus and (30.43%) scored grade C plus. Therefore, there was much correlation between the joint examination performance and KCSE examination performance since all school that sat for the joint exam improved in KCSE examination performance after adopting conveyor belt marking. Teachers and administrators need to know that there is error in examination marking in classroom, but, more specifically how reliable is determined and how much error is likely to occur. With so much emphasize on high stakes testing for promotion to the next level of academics, course placement, Campus to join, graduation teachers and administrator's accountability and school accreditation, it is critical that all educators to ensure that conveyor belt marking is adopted for reliable test score and standardize performance. Student grades present quantifiable evidence of student achievement, open the doors of higher education and still frequently determine how students view themselves. Standardized achievement tests are administered and marked under uniform conditions making it possible to compare the performance of one exam to another.

Table 3. Students Grades Improvement from Joint Exam to KCSE Exam Performance Though Conveyor Belt Marking

	Joint Exam		KCSE		
Grade	Frequency	Percentage	Frequency	Percentage	% change
A	0	0	1	0.02	+0.02
A-	2	0.04	60	1.25	+1.21
B+	25	0.53	229	4.79	+4.26
B	108	2.29	466	9.74	+7.45
B-	251	5.32	628	13.12	+2.466
C+	522	11.07	922	19.27	+8.2
C	822	17.43	1114	23.28	+5.85
C-	1098	23.28	797	16.66	-6.62
D+	953	20.2	392	8.19	-12.01
D	634	13.44	152	3.18	-10.26
D-	249	5.28	22	0.46	-4.82
E	52	1.10	2	0.042	-1.06
TOTAL	4716		4785		

From **Table 3**. It is observed that quality grades in KCSE examination improved by (29.456%) from the previous joint examination after adopting belt marking at the school level, a clear indicator that when the students were sitting for KCSE, they were aware of what was expected in answering questions and therefore they improved in their quality grades and 2306 managed to get C plus and above in KCSE examination results, which is the entry grade to the university for one to pursue a degree program. Hence CBS had the strength of increasing the number of students joining the university, marking reliability, team work and efficiency among other advantages. The poor grades from all extra-county secondary schools reduced by 34.77 percent from the previous joint examination, an indicator that students in these secondary schools performed well.

V. CONCLUSION AND RECOMMENDATION

A. Conclusion

There is positive correlation and significant relationship between conveyor belt marking in joint examination and KCSE national examination, therefore conveyor belt marking increases the efficiency and accuracy in performances. Students were of the opinion that all secondary schools replace traditional marking with conveyor belt marking and adopt it in all schools, especially when marking internal examination before the student sit for national examination. Students felt that belt marking would protect them from those teachers who are biased and unfair in their marking. It was observed that belt marking allows the examiner to specialize in one question or questions assigned to him/her, thereby increasing the pace of marking. There is deep understanding of the marking scheme as the marker concentrates on the few questions thereby improving on reliability of marking and this contributes to efficiency and fairness in marking

B. Recommendation

Teachers and administrators need to know that there is error in examination marking in their schools since traditional marking system may give high face validity by giving excellent results to the students, but proven wrong in the final national examination. Traditional marking system may be marred by inappropriate marking schemes, rating inconsistencies, foul play favoritisms and unfairness, which brings false reflection of student ability. If schools-based examinations score is to be used to improve teaching and learning, test scores must be reliable and one way to improve reliability is through conveyor belt marking. The students felt that belt marking minimizes malpractice resulting in high degree of fairness in the marking process. Therefore, the conveyor belt marking should be adopted not only by the schools in Murang'a but also in Kenya as the country when marking internal examinations at the school level for positive correlation in performance.

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