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Original Research Article

Controlling Examination Malpractice in Senior High Schools in Ghana through Performance-Base Assessment

Abraham Gyamfi[1*]

[1]Wesley College of Education, Mampong Rd, Kumasi, Ghana

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***Corresponding author:** Abraham Gyamfi
Wesley College of Education, Mampong Rd, Kumasi, Ghana

Abstract

The purpose of the study was find out the perceive impact performance-based assessment on examination malpractice at the SHS level. This study employed descriptive design. A performance-based test was developed by the researcher. The population for the study were mathematics examiners and teachers and public SHS three students in in the western region of Ghana. A multistage sampling procedure was used for the selection of respondents for the study. The study made use of stratified, simple random and census techniques for selecting participates for the study. In all, sample of 240 examiners and 150 mathematics teachers in the western region of Ghana was selected for the study. The instrument for the data collection of the study was questionnaire. Data collected was analysed with means and standard deviation. It was found that mensuration, set, equations and inequalities, business mathematics and algebraic expressions were expressed to attract much malpractice whiles graphs, angles and construction were found to least attract malpractice. The result also showed that PBA could reduce examination malpractice at the SHS level. It was therefore recommended that the West African Examination Council should give a try-out of PBA in the SHS for some selected schools to further ascertain the strength and weaken of the developed PBA.

Keywords: Examination practice, performance-based assessment, mathematics, concepts.

INTRODUCTION

Globally, there has been several reforms in the assessment of assessment of student' learning especially in mathematics. This is the period for this emphasis on assessment because although there has been an improvement in mathematics curriculum and instruction, much improvement has not been seen in the area of assessment in mathematics (Firestone & Schorr, 2004; Bahr, 2007). As Ridgway (1998, p. 2) stated, "as an issue of policy, the implementation of standards-based curricula should always be accompanied by the implementation of standards-based assessment

Classroom assessments in mathematics have faced a series of challenges to students' achievement in relations to PBA. These challenges have been listed by Gao (2012) to include a focus on recall of isolated items of knowledge. To improve student achievement, mathematics, Gao (2012) suggested that assessment should be fused into planned instruction and relate to the students' real world experiences. It is observed that the traditional questions students' response to at the SHS have one correct answer and not authentic even though some are performance-based. A comparison of traditional assessments tasks and the newly developed performance-based assessment tasks is presented in Table 1.

Table 1: Comparison of Traditional and Performance-based Task

Traditional assessment	Performance-based assessment
a. Using a scale of 2cm to 1 unit on both axes, draw on a sheet of graph paper, two perpendicular axes 0x and 0y for $-5 \leq x \leq 5$ and $-5 \leq y \leq 5$. b. Draw on the same graph sheet, indicating clearly all vertices and coordinates i) ΔABC with vertices A(2, 1), B(1, 4) and C(-1, 2); ii) the image of image $\Delta A_1B_1C_1$ of ΔABC under a reflection in the line y = 0, where $A \rightarrow A_1$, $B \rightarrow B_1$ and $C \rightarrow C_1$ iii) the image $\Delta A_2B_2C_2$ of ΔABC under a translation by the vector $\binom{-2}{1}$, where $A \rightarrow A_2$, $B \rightarrow B_2$ and $C \rightarrow C_2$ iv) the image $\Delta A_3B_3C_3$ of ΔABC under an anticlockwise rotation of 90° about the origin where $A \rightarrow A_3$, $B \rightarrow B_3$ and $C \rightarrow C_3$ v) what single transformation maps $\Delta A_1B_1C_1$ onto $\Delta A_3B_3C_3$ where $A_1 \rightarrow A_3$, $B \rightarrow B_3$ and $C \rightarrow$ C3 (WASSCE 2019Q9)	At the wedding ceremony of Nana Ayebine-Gyamfi, the photographer took a picture of the couples. The photographer realised that the original picture (object) lies within the range of 1 to 5 on a Cartesian plane both axes. a. Record four possible coordinate of the picture b. Using an appropriate scale, plot the ordered pairs and join the points to form a shape. c. What is the specific name of the plane shape drawn d. Rotate your picture through 90° anticlockwise about the origin to form image 1. Label your image appropriately. e. Using a scale factor within the range of -2 to 2, enlarge your picture to form image 2. Label your image appropriately. f. Reflect your picture in the line y=2

In view of the strengths of performance-based assessment, Lane and Stone (2006) reported that a well-developed performance-based assessment could reduce examination malpractice The Performance-based assessment unlike the traditional forms of assessment at the senior high school is characterised by multiple correct answers because the approach may differ from one examinee to the other making copying or exchanging of information difficult. It is also not possible for students to utilize information brought to the examination hall because; the process would have to be created right in the examination hall. As a result, preparing answers beforehand would be difficult.

The large number of students involved in examination malpractice in Ghanaian SHS is enough to negatively affect the credibility of Ghana's education system. It is believed that the high incidence of examination practices in the senior high school mathematics could be attributed to the low usage of performance-based assessment. With the developed PBA items which is on-demand, students would have to craft their own unique answers depending on the irrespective approach taken. This will make it difficult for students to copy from each other or teachers solving questions to be sent to students or the invigilators attempting to help individual students.

Performance-based assessment (PBA) as a contemporary form of assessment is perceived to addresses many of the challenges associated with the traditional assessment. The focus of PBA has to do with application of knowledge. According to Nitko (2004), PBA is a form of assessment that presents a hand on task which requires students to perform activity that requires application of knowledge and skills from several learning. It allows students to show how well they have learnt. Basically, a PBA is one that students are required to show that they have acquired specific skills and competencies which is evidenced in what they perform or produce. Ainsworth and Viegut (2006) defined performance-based assessments as an "activity that requires students to construct a response, create a product, or perform a demonstration" (p.57). Performance-based assessment deals with the overall experience of a student in performing a learning target by applying their knowledge and skills from several areas. Performance-based assessment also lends itself to multiple procedures to a task therefore resulting in multiple correct responses (Topping, 2005).

Performance-based assessments (PBA) also called authentic assessments, could be used as a summative assessment procedure to document not only students' knowledge on a topic, but their ability to apply the knowledge in a "real-world" situation (Brennan, 2006). By asking students to produce an end product, PBA causes students to reorganize their knowledge and use their skills to apply the knowledge a new set of situations capable of occurring outside the normal classroom (Palm, 2008). Performance-based assessment includes designing and constructing a model and developing, solving a mathematical problem that mimic real life situation by apply knowledge and skills. Also, students can undertake and report on a survey, conduct a science experiment, write a letter and create and test a computer program (Darling-Hammond & Pecheone, 2009; Wren, 2009).

Whatever the type of performance, performing an authentic task that excite a real life experience and imitate real world challenges is the common factor in all PBAs (Wiggins & McTighe, 2005). Performance-based assessment is used in numerous countries and has numerous advantages which are not offered by traditional tasks. Wiggins and McTighe (2005) asserted

that, in fact, authentic assessments go beyond just testing to teaching students and their teachers what goes into performing of a subject (Falk, Ort, & Moirs, 2007; Shepard, 2009).

Performance-based assessment as a formative assessment provides timely feedbacks than traditional classroom large-scale standardized tests. This is because standardized tests could last for months to produce feedback, but PBA permits teachers to make significant modification while their current students are being taught (Darling-Hammond & Pecheone, 2009).

In addition to the impacts of PBAs on student outcomes, the implementation of PBAs procedures could also inform classroom instructional strategies. Though it could be challenging to effect change in the patterns of general teaching and learning under some circumstances such as large class size, PBAs could change particular behaviours and activities in the classroom such as motivation and participation (Topping, 2005).

Assessment policies and practices at all levels are seeing rapid transformation. Complex performances of the traditional assessment are being used as the foundation that is guiding current wheel to change assessment. Examples include the recommendation to use more of essays, open-ended problems, computer simulations of real world problems, hands-on science problems, and students' portfolio. Collectively, these assessment forms are called "authentic or performance" assessments (Wiggins, 1989). The term suggests performance of tasks considered to be of importance. In contrast, paper-and-pencil, multiple-choice tests and some essays and computational problems are difficult to mimic real life situations. Being able to transfer classroom learning to real life situations are indicators and goals of learning. The worse aspect is that, the procedures that may help achieving the goal become distorted. The lack of correspondence between classroom learning and real life situation has become an increasingly important concern in assessments. The resultant is an increased in significant motivation for the recent calls for "authentic" assessment.

Although authentic assessment seems new, standard guidelines from some measurement specialists have been there for a long time. For example, Lindquist (1951) argued that "it should always be the fundamental goal of the achievement test constructor to make the element of his test series as nearly equivalent to, or as much like, the elements of the criterion series as consequences of efficiency, comparability, economy, and expediency will permit" (p. 152). With regard to the construction of items for measuring critical reasoning skills and higher-order thinking, Lindquist went on to note that "the most important consideration is that the test questions require the examinee to do the same things, however complex, that he is required to do in the criterion situations" (p. 154).

According to National Council of Teachers of Mathematics (2010), assessment that improves learning of mathematics should be a usual part of on-going classroom activity rather than a hiatus. Assessment is a means to an end and "does not simply mark the end of the learning cycle" (Nitko, 2006). Rather, assessment should be fused into the teaching and learning to encourage and support further learning. Naturally, in every lesson, there are opportunities for informal assessment (Rotman, 1993). They are include listening to students as well as observing and making sense of what students say and do in the class. For young children in particular, the observation of students' work brings to bear the qualities of thinking which written or oral activities cannot reveal (Schoenfeld, 2000). Teachers should look out for different assessment opportunities when planning instructions and making decisions about instructions (NCTM, 2010). Questions such as the following should constantly be part of the teachers' planning: "What questions will I ask?" "What will I observe?" "What activities are likely to provide me with information about students' learning?" Gao (2012) stated that "preparation for a formal assessment does not mean regular instruction should pause and resort to teaching to the test" (pg 9). On-going teaching and learning is the best preparation for assessment for students. Similarly, for teachers, the foundation of the best teaching is on-going assessment. This is the way to go with mathematics.

According to Gyamfi (2017), mathematics is not all about doing, solving problems, performing algorithms but includes an element of appreciation. Appreciation of mathematics involves having a qualitative comprehension of some of the key concepts of mathematics such as proof and structure. The instructional process of mathematics should not be restricted to only the cognitive and psychomotor domains of learning but to the affective domain as well. That is students should be made to understand the principles of the subject in order for them to have a rational understanding of the concepts.

According to Messick (1989), the single most essential feature of any good assessment information is its ability of the assessment to assist teachers and other stakeholders to make correct decisions. This characteristic is called validity and without validity, the assessment data will not lead to a correct decision. Nitko (2004) defines validity as the "soundness of the interpretation and use of students' assessment results" (p. 36). This implies any activity that adversely affects validity of scores would inevitably affect major educational decisions that must be taken based on the scores. Validity emphasizes the interpretations and uses of the results but not the test instrument. Nitko (2004) has identified four principles of validation that would

help individuals to decide the degree to which assessment (or examination) result could be valid:

The interpretation (meaning) ascribed to students' assessment results are valid only to the degree that evidence can be produced to support their soundness and correctness (Sam, 2012). When students obtain high scores in examination as a result of cheating, no evidence can be produced to support the appropriateness and correctness of their examination scores. This is because the purpose of such candidates is to obtain higher grades than they would be likely to receive on the basis of their own achievement (Ebel & Frisbie, 1991; Sam, Gyamfi, & Yeboah, 2019). Such examination malpractice offers them higher grades than their normal classroom ability. To interpret their high scores as measuring improvement in their performance would be unsound or invalid.

The uses made of assessment results are valid only to the degree that evidence can be produced to support their appropriateness and correctness. Examination results have several purposes. These include certification which is the main objective of examinations conducted by WAEC (WAEC, 1974). This facilitates job placement and selection to appropriate higher education. Evidence should be provided for the intended use of the assessment results. If the students' scores could not be established to be appropriate or correct due to examination malpractices, then test developers and users would not be able to validate further use of the test scores.

The interpretations and uses of assessment (examination) results are valid only when the educational and social values implied by them are appropriate. The interpretation and uses of examination scores are expected to be appropriate in terms of educational and social values. According to Torrance (2005), examination was intended to devise ways of discriminating between individuals and students when distributing access to scarce commodity of education and subsequent life opportunities. Examination malpractices, however, create unfairness to accessibility to higher education as well as job opportunities. Hence, it undermines the educational and social values of examination, leading to low validity of examination scores.

The interpretations and uses made of assessment results are valid only when the consequences of their interpretation and uses are consistent with appropriate values. The consequences of the interpretations and uses of examination results must also be taken into consideration in order for the result to have high validity. Nitko (2004) explains that every action one takes has a consequence. Test users must take into consideration these consequences when evaluating whether one is using the assessment results validly or not.

Unfortunately, malpractices in examination have negative consequences on the interpretation and uses of examination results, leading to low degree of validity. Such practice is an embarrassing act to the nation (Bonney, 2006). It is also a way of breeding corrupt and irresponsible citizens who will eventually grow to become the bane of national development (Awuni, 2008).

Kan-Dapaah, a former Minister of Communication for 2009 had also reiterated that examination leakages and malpractices damage the credibility of certificates awarded to deserving students (Ghana News Agency, 2007). Those who are caught involved or engaged in examination malpractices are penalised (WAEC, 2006) and, therefore, may not have effect on validity of their scores. The West African Examination Council, each year, as it releases the examination results, also reports on the culprits that were identified during the conduct of the examination or marking of scripts. What happens to those who were not identified and, therefore sneaked, into the job market or any of the tertiary institutions? There are pieces of evidence that some cheated but they were not caught (Amoah, 2007; Cohen, & Wollack, 2006).). It is worthy of note that examination malpractices in all forms violate all the four principles of validation. Since examinations conducted by the WAEC have not been free from malpractices (Adomako, 2005), there is the need to trace the causes and prevalence of this canker in the society to increase the validity of the examination results

Research Questions

The following research questions were formulated to guide the study;

1. Which mathematical concepts in the SHS attract much malpractices?
2. What is the perceived impact of the newly developed performance-based assessment on examination malpractice in senior high schools

RESEARCH METHODS

Research Design

This study employed descriptive design. The design was used to collect information to describe concepts that attract much malpractice and the perceived effect of PBA on examination malpractice at the SHS level. In this study, initial data were collected through a focus group conducted in the early stages of the study. Feedback from the focus group discussion was used to organize consensus on items be included in the test. These data became the basis for developing the performance-based assessment items and the rubric. Based on the information, table of specifications, was prepared to guide the development of the instruments to ensure content validity and relevance (Newman, Lim & Pineda., 2011). A performance-based test was developed by the researcher.

Population, Sample and Sampling Procedures

The population for the study were mathematics examiners and teachers and public SHS three students in in the western region of Ghana. There are 275 mathematics examiners in the region and 321 mathematics teachers in the region as at 2019. Out of the 35 schools five (5) are in category A, 12 in category B and the remaining 18 in category C.

The accessible population mathematics teachers in the 15 SHS selected for the study and the mathematics examiners in the region

A multistage sampling procedure was used for the selection of respondents for the study. The study made use of stratified, simple random, census and purposive sampling techniques

The Ghana Education Service's category of school was used as the strata. That is five schools from categories A, B and C were selected. All mathematics teachers in the selected schools who satisfy the exclusion condition were selected via census. The mathematics teachers should not be an examiner have taught for not less than one year. This was to avoid one person responding as an examiner and as a teacher. Also, census were used select all WEAC examiners in the region with the exception of first time examiner. First-time examiners and teachers with less one year experience were excluded because they have had experience with marking of marking and all concepts respectively.

Data Collection Instrument

The instrument for the data collection of the study was questionnaire. The questionnaire was of three parts; the first was on the bio-data of respondents, the second part looked at mathematical concepts at the SHS that attract much malpractice. The third part of the questionnaire looked at the perceived impact of performance-based assessment on examination malpractice.

Data Collection Procedures

The questionnaire was administered to examiners the centre at the time of conference marking and selected teachers in their respective schools with a sample of the performance-based test attached to the questionnaire. This was to provide information on mathematical concepts at the SHS that attract much malpractice and the perceived impact of performance-based assessment on examination malpractice.

Data Processing and Analysis Procedure

For the questionnaire, the scoring were reversed for the negative statements as Very Often (VO) = 1, Often (O) = 2, Quite Often (QO) = 3 and Fairly Often (FO) =4 for the items on content that attract much malpractice and (SA) = 4, Agree (A) = 3, Disagree (D) = 2 and Strongly Agree (SD) =1 for items on perceived impact of performance-based assessment on examination malpractice. Data collected was analysed with means and standard deviation.

Analysis of Data on Research questions

The research question sought to find out the perception of the mathematics teachers and examiners on the concepts of mathematics that attract much examination malpractice and if the newly developed performance-based assessment for senior high schools could reduce examination malpractice.

Concepts that attract much malpractice in examination

Data was collected from mathematics teachers and WEAC mathematics examiners using questionnaire. A list of concepts were presented to the respondents to indicated how often the attract malpractice. On a four-point, Likert-type scale 4 = Very Often, 3 = Often, 2 = Quite Often, and 1 = Not Often, teachers and examiners were asked to indicate their levels of agreement or disagreement with statements posed the listed concepts that attract much examination malpractice. Means and standard deviation were used to analyzed the data. The total value of scores is 10 (4 + 3 + 2 + 1). This gives a mean of 2.5 for each of the responses out of the total of 4. That is the total 10 divided by the 4 responses The 2.5 is also the middle point for the four–point scale. The difference of the minimum of 1 and 2.5 which gives 1.5 is divided into 2 making 0.75. Therefore, the mean cut-off points for the questionnaire for the variables were: 3.25 – 4.00 = very often, 3.24 – 2.50 = Often, 2.49 – 1.75 = Quite Often and 1.74 – 1 = Not Often. A mean of 2.50 and above indicates respondents' agreement while a mean of 2.49 and below indicates respondents' disagreement. The mean of the items were estimated by adding up all the responses to each item by each respondent and then dividing by number of respondents who responded to that particular item. The descriptive statistics of the results on the items of concepts of mathematics that attract much examination malpractice is presented in Table 2.

Table 2: Descriptive Statistics of the Concepts of Mathematics that Attract Much Examination Malpractice by Mathematics Teachers and Examiners (N = 390)

S /N	statement	Mean	Std. Dev
1	Graphs	1.25	.455
2	Mensuration	2.91	.853
3	Angles	1.98	.755
4	Construction	1.17	.400
5	Set	2.78	.948
6	Equations and inequalities	2.94	.809
7	Business mathematics	3.25	.788
8	Algebraic expressions	3.28	.748
	Total	2.445	0.720

Source: Field study, Gyamfi (2020)

Table 2 shows the results of the descriptive statistics on the concepts of mathematics that attract much examination malpractice. It is obvious from the results that generally, the respondents expressed the listed often attract malpractice during examination. For example, it was realized that the general mean (M = 2.445; SD = 0.720) lies in the cut-off of often. The results suggest the teachers and examiners believed that often there is examination malpractice with the listed concepts.

Out of the eight concepts, five, mensuration, set, equations and inequalities, business mathematics and algebraic expressions were expressed to attract much malpractice. This is because those concepts had means greater than the average mean of 2.50. The remaining three concepts; graphs, angles and construction were found to least attract malpractice as expressed by the teachers and the examiners. This is because the means are less than the general mean of 2.445.

Perception on how the newly developed PBA could reduce examination malpractice

To find the out the perception on whether the performance-based assessment could reduce examination malpractice in mathematics, questionnaire for the 1) teachers, 2) examiners were used. A list of statements that measures the how the newly developed instrument could reduce was given to respondents. For the questionnaire, on a four-point Likert-type scale 4 = strongly agree, 3 = agree, 2 = disagree, and 1 = strongly agree, teachers and examiners were asked to indicate their levels of agreement or disagreement with statements posed on the effect of PBA on examination malpractice. The data was analysed means and standard deviation. The total value is 10 (4 + 3 + 2 + 1). This gives a mean of 2.5 for each of the responses out of the total of 4. That is the total 10 divided by the 4 responses The 2.5 is also the middle point for the four –point scale. The difference of the minimum of 1 and 2.5 which gives 1.5 is divided into 2 making 0.75. Therefore, the mean cut-off points for the questionnaire for the variables were: 3.25 – 4.00 = strongly agree, 3.24 – 2.50 = agree, 2.49 – 1.75 = disagree and 1.74 – 1 = strongly disagree. A mean of 2.50 and above indicates respondents' agreement while a mean of 2.49 and below indicates respondents' disagreement. The mean of the items were estimated by adding up all the responses to each item by each respondent and then dividing by number of respondents who respondents who responded to that particular item.

The descriptive statistics of the results on the perceived impact of performance-based assessment on examination malpractice in mathematics is presented in Table 3.

Table 3: Descriptive Statistics of the Results on how Performance-based Assessment could Reduce Examination Malpractice in Mathematics by Mathematics Teachers and Examiners

S /N	Statement	N	Mean	S. D
1	The individual student will find it difficult to copy answer from colleagues	390	3.32	.756
2	Collusion could easily be detected	390	3.44	.661
3	It will be difficult for an invigilator to assist individual students	390	3.10	.629
4	Teachers will find it difficult to write separate answers for each students	390	3.27	.708
5	Copying answers from notebooks and other textbooks becomes almost impossible	390	3.10	.692
6	Leakage of the items will still make collusion difficult	390	3.02	.713
7	Students would be discourage to copy answers from colleagues	390	3.27	.752
8	Students are to create answers right in the examination room	390	3.19	.638
	Total	390	3.213	0.694

Source: Field study, Gyamfi (2020)

Table 3 shows the results on how performance-based assessment could reduce examination malpractice in mathematics. It could be realised from the results that generally, the respondents agree with the statements concerning statement on how performance-based assessment could reduce examination malpractice in mathematics. For example, it was realized that the teachers and examiners had a general mean (M = 3.212; SD = 0.694) which is greater the cut-off mean of 2.50 indicating that the teachers and examiners agreed with the statement on how performance-based assessment could reduce examination malpractice in mathematics. The results suggest the teachers and examiners expressed that PBA could reduce examination malpractice in mathematics.

Out of the eight items on how performance-based assessment could reduce examination malpractice in mathematics; all had means greater than the average mean of 2.50. This means the teachers and examiners believe PBA could reduce examination malpractice. Out of the eight items, teachers and examiners showed that four of them have higher chances to reduce malpractice because the means were greater than the mean of means of 3.212. The result of the items with higher chances is presented in Table 4.

Table 4: Result of the Statement with Higher Chances of the PBA to Reduce Malpractice by Mathematics Teachers and Examiners

S /N	statement	N	Mean	Std. Dev
1	The individual student will find it difficult to copy answer from colleagues	390	3.32	.756
2	Collusion could easily be detected	390	3.44	.661
3	Teachers will find it difficult to write separate answers for each students	390	3.27	.708
4	Students would be discourage to copy answers from colleagues	390	3.27	.752

Source: Field study, Gyamfi (2020)

The table shows that PBA could reduce examination malpractice in that students would be discourage to copy answers from colleagues, teachers will find it difficult to write separate answers for each students, Collusion could easily be detected and the individual student will find it difficult to copy answer from colleagues.

DISCUSSION

Concepts in mathematics that attract examination malpractice

The study found that mensuration, Set, Equations and inequalities, Business mathematics and Algebraic expressions were expressed to attract much malpractice. Concepts like graphs, angles and construction were found to least attract malpractice as expressed by the teachers and the examiners and that status main effect had no significant difference in concept that attracts much examination malpractice. Gender main effect also showed no significant difference. Strata and experience main effects showed significant difference in concepts that attract examination malpractice.

Sam (2012) stated that some teachers were caught in an examination hall writing answers to some of the examination questions on a chalkboard. It could be inferred the answered were of questions that permit and has single correct answers. This made the teachers to believe that their actions would not be detected. This is in conformity to the results of this study that found that the concepts that attract much examination malpractices are mensuration, set, equations and business mathematics. Such questions are always fixed in methods and collusion is difficult to detect. Also, questions on such concepts are always not performance-based were the students are have no option to do it by themselves. It would have difficult for the teachers to have the construct on the board for the students to copy. Even with the sample on the board, the students would have to still construct by themselves.

In the same way, WAEC (2014, 2018 & 2019) reported that collusion detected in scripts is the highest or the most popular form of examination in WASSCE. This means that questions that students respond to are those that permit or attract collusion of responses. Such questions include questions on concepts like mensurations, linear equation and business as reported by this study. This is because such questions do not have multiple correct procedures and answers. As result, once the student is able to copy the correct responses without any error, the collusion cannot be detected. Most students are able to escape detection. Normally, for questions on concepts such as construction and graphs, it difficult for students to copy from colleagues since the student would have perform or respond to the questions by themselves. The collusions are seen in the follow-up questions that require students to do some computations. Sometimes are seen getting the follow-up questions right without attempting the preceding questions. This happens when students cannot respond to the actual construction or graph and cannot copy from colleagues.

Perceived impact of the PBA on examination malpractice

The study found that PBA could reduce examination malpractice in that students would be discourage to copy answers from colleagues, teachers will find it difficult to write separate answers for each

students, Collusion could easily be detected and the individual student will find it difficult to copy answer from colleagues. The study also found that status main effect had no significant difference in how PBA could reduce examination malpractice. Gender main effect also showed no significant difference. Strata and experience main effects showed significant difference in how PBA could reduce examination malpractice. However, WAEC (2014, 2018 & 2019) reported that collusion detected in scripts is the highest or the most popular form of examination in WASSCE. This eludes the fact that most of the WASSCE items are not of the performance-based assessment. The questions that are closer to performance-based assessment type are concepts such construction and linear that even like authentic characteristics of performance-based assessment as cited in Brennan (2006). Any item that requires should to apply knowledge from different areas to solve real life problems are considered as performance-based assessment (Nitko, 2002). It is difficult for students to copy from colleagues since there are varying procedures and correct answers to the item depending on the individual situations (Asamoah-Gyimah & Anane, 2018; Darling-Hammond, 2009 & Topping, 2005). It makes difficult for teachers to provide a common answer to the students. The findings of this study is said to affirm with literature that performance-based assessment items have the potential to reduce examination malpractice.

Firestone, Mayrowetz and Fairman (1998) found that specific behaviours and procedures in the classroom could be changed with PBA under some circumstances. The change in specific behaviour in the classroom as Firestone, Mayrowetz and Fairman (1998) include among others examination malpractice. The thus confirms the study of Firestone, Mayrowetz and Fairman (1998) that performance-based assessment could be used to reduce examination malpractice. This is because on-demand performance-based assessment requires students to perform the tasks which cannot be done by a third party. Some of the performance assessment task are limited to an individual student therefore leakages and copying and their source could easily be detected. Students are required to report on the procedures that were used in completing the task (Stone & Lane, 2006).

CONCLUSION AND RECOMMENDATION

Even though some concepts such as mensuration and linear equation attract much examination malpractices with graphs and construction with little examination malpractice, the canker is a threat to education in Ghana. It is therefore prudent to embrace the developed PBA for mathematics which has been found to have the potential to manage the incidence of examination malpractice in WAEC examinations.

West African Examination Council should give a try-out of PBA in the SHS for some selected schools to further ascertain the strength and weaken of the developed PBA. This would help address any limitation to strengthen it for use in WAEC examinations at the SHS level.

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