Students' Perception, Learning Styles and Learning Depth in High-Stakes WASSCE Mathematics: The Washback Perspective and Economic Implications

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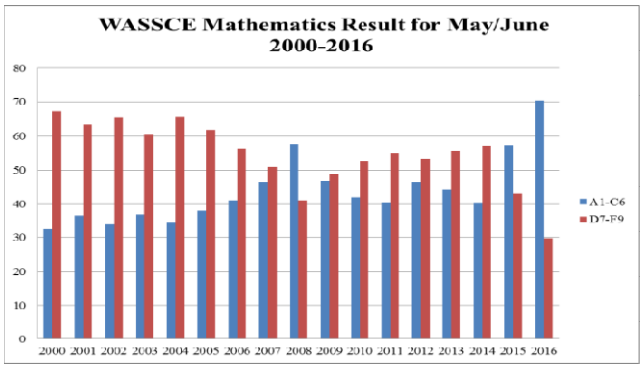
Abstract:- **This study investigated the washback effects of the West African Senior Secondary Certificate Examination on students learning depth in Mathematics. The participants comprised of 600 Senior Secondary three students, randomly selected from 30 senior secondary schools in Ebonyi state. The predictor variables are students' perception and students' learning styles while students' learning depth in Mathematics is the criterion variable Three validated instruments namely; Students' Perception Questionnaire (SPQ), r = 0.771 , Learning Styles Questionnaire (LSQ), r = 0.882 and Mathematics Learning Task (MLT), r = 0.893 were used to collect data. Three research questions were posed and data collected were analyzed using correlation and multiple regression models. Research results shows that there was a low negative but significant correlation between each of the predictor variables (students' perception, r = - 0.164, p < 0.05 and learning styles, r = - 0.097, p < 0.05) and the criterion variable (learning depth). However, students' perception of the WASSCE was found to be the most potent factor in predicting students' learning depth in Mathematics (Beta =-0.148, t =0.002, P<0.005). Again, results also show that there is a joint influence of the predictor variables on students learning depth in Mathematics and it is statistically significant but with allow predictive power of 2.9%. In view of the findings of this research, it is recommended that Learning styles that will lead to In-depth mathematical knowledge such as active learning strategy should be adopted by students preparing for the WASSCME.**

I. INTRODUCTION

In the last three decades, educationists and researchers have sought for hypotheses expressing systematic relationship between characteristics of washback on student learning and patterns of national development. More specifically, students dysfunctional learning and passing pattern in Mathematics in high-stakes West African Senior Secondary Certificate Examinations (WASSCE) evidenced in their yearly poor performance is thought provoking and matters with respect to long run growth and sustainable national development? Interestingly, there are high-performing educational systems in the world today such as Finland that do not depend on high-stakes examination to enhance teaching and learning process. Their educational quality can be described as 'outstanding' simply by going against the evaluation-driven, centralized model used by most countries.

High-stakes testing is used to make important decisions such as selection, certification and promotion. Consequently, the average Nigerian student is most likely interested in the outcome of earning a certificate than in the inputs or efforts put in the learning process. Students seem to be interested in acquiring the certificate at any cost in other to gain university admission, Teachers and schools also want credit and promotion for the excellent performance of their students, and perhaps parents also want cheap success for their children. This situation is a picture of extrinsic motivation which describes the behaviour of learners who engage in learning because it is a means to an end that has little to do with the content of what is learned. However, The fact that education and development shows glaring connectivity poses a challenge to scholars and researchers on the need to emphasize a form of education that would achieve the desired sustainable development.

In Nigeria, available evidence from public examining bodies such as WAEC shows that in the last 17 years, less than 45% of the students who registered for the WASSCE passed Mathematics at the distinction and credit level as presented on the chart below. This display is an indication of a punctured teaching and learning process as well as academic decadence. For a period of 17 (2000 - 2016) consecutive years, more than 55% of Nigerian students could not gain admission into higher institutions of learning. Consequently, enrollment continued to increase every year because of the failure rate. This situation calls for an investigation into the teaching and learning process.

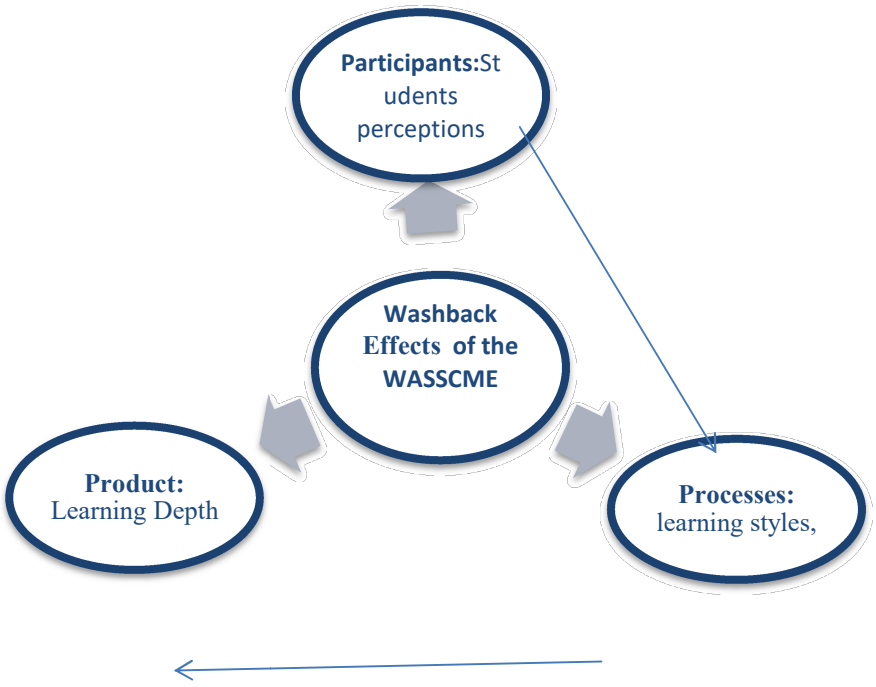


In the age we are living, what propels growth is no more physical capital but human capital (knowledge power, technology) and good knowledge of mathematics and sciences is fundamental to national development, therefore failure to improve the teaching and learning of mathematics will make the country less competitive in the global market. Again, since the central focus of teaching and learning is to ensure in-depth learning, the need for high quality and in-depth instruction and learning is therefore crucial especially at the secondary exit class.

Shohamy (1993) stated that high-stakes examination is a potent device, instrumental to behavioral change in learners. It therefore directly or indirectly influences the educational system and standard by exerting great influence on teaching and learning. This property of a test that describes its influence on teaching and learning is what is referred to as washback. The origin of this term is premised on the fact that examination often come at the end of teaching and learning and as such its influence on teaching and learning seemed to be working in a backward direction, hence the word washback (Pearson 1988). How has washback played out in Nigeria's educational system is at the center of this analysis and an example of high stakes testing and learning could suffice.

The concept of Washback in High-stakes testing, teaching and learning

More often than not, high-stakes public examinations influence the attitudes, behaviors, and motivation of stakeholders in the educational system, and research on this concept has gained prominence overtime because of the increased use of tests by institutions and offices to evaluate candidates' competences for employment, promotion, selection and admissions into higher school of learning. Testing therefore appears to propel or even define what is being taught and learnt in our schools, influencing and impacting on the participants, process and product of teaching and learning. Participants in the micro context refer to teachers and students in relation to their attitudes and feelings towards the high-stake examination. As a result of their perceptions, they may change their processes, such as testing/teaching practices or methods, choice of classroom activities, learning styles and activities and teaching content Hughes (1996) in Abdulhamid, (2013). The outcomes of this behaviour then constitute the products which are a proof of intended or unintended consequences of the examination. In essense, high-stakes testing influences educational stakeholders, the process as well as the outcome of education. This influence is referred to as examination washback. The conceptual base for the present study focused on Hughes model of Washback as presented below.



Examination Washback could be negative or positive, beneficial or harmful (Bailey, 1996). Negative washback occurs when there is a variance between the stated goals of instruction and the focus of examination, which may lead to the abandonment of curriculum goals in favour of examination preparation. This happens when teachers adapt their teaching styles to make classroom presentations more like the format of the examination or when the learners adopt learning styles that would just enable them to pass without real in-depth knowledge of the content being studied. These practices may lead to increase in students' scores(test score pollution) without a commeasurable increase in learning (Choi, 2008).

Another negative effect that might be caused by high-stakes examinations is the tendency to promote traditional ways of delivering instruction on the part of teachers. Traditional or dull teaching is described by Gorsuch (1999) as (a) teacher centered; (b) teacher-to-whole-class oriented; (c) focused on the learning of discrete facts; (d) product oriented in that students are expected to repeat facts through recitation and written test). Traditional teaching, thus, prompts teachers to deliver instruction through low cognitive processes—memorization and rote learning rather than comprehension and meaningful learning, and restrain real teaching, making teachers focus on the quantity rather than quality of learning, and on grade performance, rather than real improvement (Black and William, 2006). This method is also adopted by the learners and the trend continuous from year to year leading to undesired learning output. High-stakes testing is therefore limited to lower-level content knowledge and encourage the narrowing of the curriculum rather than in-depth and active learning. Teachers and administrators are unlikely to adopt inquiry-based approaches for fear they will negatively impact student performance on the tests (Newmann, Bryk, & Nagaoka, 2001).

Generally, washback can be seen as an educational phenomenon which describes examination effects – positive or negative, intended or unintended (primarily on test takers and teachers - micro washback, and then on all other stakeholders in the educational process - macro washback or test impact) that are induced on teaching and learning as a result of administering an old, revised or new examination (Bachman and Palmer, 2010; Hung 2012; Cheng 2005).

Theoretical Literature

High-stakes testing and Students' Perception

This study is an attempt to investigate how high-stakes examinations potentially influence classroom learning. However, research by Chapman and Synder (2000) and Burrows (2004) stated that it was not the examination itself that influenced classroom practices and behaviour; rather it was participants' perceptions and beliefs about the examination. This was supported by Alderson and Wall (1993) who said that, no matter the nature of the washback effect, it is independent of the quality of a test. It was therefore necessary to investigate participants' perception and beliefs about the examination. Such perception, beliefs, and attitudes have become an important determinant of learning behaviour and constructs worthy of investigation.

In a study on examination washback, EtukAfangideh, Maria E and Uya, Asukwo O. (2013) explained the relationship between perception and behaviour. They asserted that Stakeholders' or participants' perception and attitude is an important mediator in washback effects. Students' participation in the teaching and learning process is important but their perception present some challenges to the process. Students' perception and beliefs about their Mathematics certificate examination can aid them to adjust their learning strategies to enhance understanding and achievement. A person's belief and perception about an idea or object determines how the person would like to behave towards that idea or object. Therefore, behaviour is thought to be influenced by the perception and belief that a particular action will lead to desirable outcome.

Satomi (2009) also investigated the role of beliefs in bringing about washback and observed that beliefs functioned as catalysts for various types of washback effects. The study revealed that positive beliefs led to positive washback while negative beliefs led to negative washback. What teachers believe, to a large extent determines what gets taught, how it gets taught, and what gets learned in the classroom". Madaus (1988) in his discussion about the influence of measurement driven instruction and high-stakes testing stated that.

> *The power of tests and examinations to affect individuals, institutions, curriculum, or instruction is a perceptual phenomenon; if students, teachers, or administrators believe that the results of an examination are important, it matters very little whether this is really true or false-the effect is produced by what individuals perceive to be the case. When people perceive a phenomenon to be true, their actions are guided by the importance perceived to be associated with it. Thus, testing programs that have the greatest impact on instruction and learning are those that students, teachers, administrators, parents, or the general public believe, rightly or wrongly, are used to make important decisions that immediately and directly affect them'.p 35*

Participants' perceptions and beliefs concerning high-stakes examination therefore influences instructional practices and learning behaviour to a large extent. According to Green (2007), washback studies can be divided into two groups; one focusing on participants' perceptions and the other on participants' actions. He stated that a test affects participants' perception before affecting their actions and behaviours positively or negatively. Hence participants' perception is the

corner stone of all washback studies. This study therefore focuses on both participants' (learners) perceptions as well as their actions (learning practices) in determining their learning depth.

High-stakes testing and Students learning styles

A learning style is defined as the way in which a person begins to concentrate on, process, internalize, and remember new and difficult academic information (Hall 2008). It is an important factor that predicts students' learning depth. While teachers prepare lessons and deliver instruction, it is ultimately the student's responsibility to interpret, understand, and retain such information in a way that permits easy retrieval and recall for application. In order to perform these tasks, students in the certificate class employ different styles and practices of learning. Study styles and habits adopted by some senior secondary certificate class students include memorizing formulae and procedures, practicing past examination questions, studying with examination guide and key points and studying test taking techniques.(Munoz and Alverez,2010; Shiva, 2012;Tugba, 2012).

In a study by Morrison and Tang (2002) on teachers' views of testing, it was observed that tests and examinations were demotivating and did not guarantee long-term learning. Teachers and students relied on tests and examinations to ensure learning, particularly of book knowledge. And the need to pass examinations and tests drove students' learning. They concluded by saying that tests and examinations were strong partners to didactic, textbook-driven methods, drill, rote learning, memorization and superficial learning.

Empirical Literature

We have a few studies drawn from the rich literature on wash back effect. Incidentally, they are all drawn from Asian countries that are naturally not English speaking. Nevertheless, the literature is full of studies of wash back on English and not mathematics.

Beginning with Tsagari D. (2011), who explored the relationship between the intended influence of first certificate in English (FCE) examination, teachers perception towards the examination and teachers' classroom practices in Cyprus. They explored the relationship between intended influence of FCE on teachers perception and classroom practices. They employed general interviews as methodology. Their findings show that the exam made students dependent on teachers concerning language learning and exams preparation. Students' dependence on teachers as well as their accountability towards parents and employers made teachers feel stressed and anxious as success in the exam was the yardstick for judging their professional status. Again, there was washback in the way teachers designed their classroom test. They gave tests following the types found in the exam. The exam influenced learning leading to memorization of hundreds of prepositions, idiomatic expressions and so on. In summary, the exam was believed to have impacted both teachers and students negatively.

Tugba (2012), also explored the effects of high-stakes Mathematics examinations in postprimary schools in Turkey and Ireland. They investigated the effects of high-stakes examination on the teaching and learning of mathematics. As an approach, they passed questionnaires, interviews, classification of examination questions. Irish teachers' responses revealed negative attitudes arising from the fact that mathematics was compulsory, and some teachers felt that it made students 'hate' mathematics because of the focus on the examination in the teaching of the subject. One of them said, "The examination system makes students just worry about the examination and worry if they are going to pass or worry if they are going to fail rather than think about the different topics of mathematics just as 'this is the topic in mathematics that I am learning – it is the topic: can I pass it? Will I fail it? How will I do in the examination?".

Another study by Uzma and Mohammed (2014), on Higher Secondary School Certificate (HSSC) in Pakistan, explored the causes of low level English proficiency at the completion of 12 years of academic education with English as a compulsory subject. In particular the study investigated the washback effect of the HSSC on English teaching and learning. The outcome is that most teachers reported that they have taught sufficiently the lessons that are supposed to be tested in the examination because it is the principal objective of teaching. What a wrong notion. High-stakes examination has done more harm than good. Their syllabus was selectively approached so as to give more time and extensive practice to the demands of the examination. The HSSC examination affected teachers in the selection of teaching method, material, content, and students in their learning styles. Again, principals of institutions ensured the fulfillment of the HSSC objectives so as to show a good result for the exam. Findings suggest that HSSC, instead of supporting has negative washback effects in teaching and learning.

An empirical study by Yahya et al (2014) based their study on General Secondary English Examination (GSEE) in Yemen. The study investigated the washback effect of the GSEE influence on teaching and learning. As a way of approach, it employed the use of interviews and questionnaires. It's findings show that the learners' motivation for learning was purely instrumental because the learners felt that the examination held the key to their future and university admission so they have to put in great effort, time, and resources to qualify for a better future.

What is revealing in the literature is dearth of investigation of the influence of students' perception and learning styles on students' learning depth in high-stakes WASSCE Mathematics, especially in Africa. Again, the general findings does show a negative effect of wash back on teaching and learning. We therefore consider this article novel

and relevant in understanding the phenomenon from the Mathematics perspective.

Statement of Problem

WAEC as a public examining body in English speaking West Africa, plays a major role in the Nigerian educational system by providing standardized examination across the federation in all subjects. Unfortunately, Nigerian students' Mathematics result in the WASSCE is characterized by high failure rate over the years. This situation could be linked to examination washback. It was therefore needful to investigate how High-stakes examinations influences students' learning and determine the implication of the research results to higher education and national development.

Scope of the Study

The study is strictly concerned with the washback effects of the West African Senior School Certificate Examination on Mathematics learning. The study involved SS3 Mathematics students from selected secondary schools in Ebonyi state, Nigeria. Both public and private schools from urban and rural areas were used in other to have a good and adequate representation of the population of SS3 students in the state under consideration.

Significance of the Study

A major significance of the study is that, understanding the washback phenomenon informs educators on how to use high-stakes examinations to produce better and positive in depth learning in an examination oriented country. Againan analysis of students' perceptions and beliefs shows the need for stakeholders to foster positive perception among students concerning the WASSCME.

Research questions

1. What kind of relationship exists between each of the predictors (students' perception of high-stakes Mathematics examination and their learning styles) and the criterion variable (students' learning depth in high-stakes Mathematics)?
2. What is the composite contribution of the independent variables (students' perception of high-stakes mathematics examination and their learning styles) to the prediction of the dependent variable (students' learning depth high-stakes Mathematics)?
3. What is the relative contribution of the independent variables (students' perception of high-stakes mathematics examination and their learning styles) to the prediction of the dependent variable (students' learning depth in high-stakes Mathematics)?

II. RESEARCH METHODOLOGY

The research design is Expost facto (non-experimental) and was executed using quantitative approach which involved data collection through questionnaires. Two independent variables used in this study are; Students' Perception of the WASSC Mathematics and Students learning styles/practices while Students Depth of learning is the dependent variable. The target population for this study consisted of all senior secondary three (SS3) students in post primary schools in Ebonyi State.

The study adopted a multistage sampling technique which involved purposive, simple random and stratified sampling techniques. Ebonyi state which is naturally stratified into three senatorial districts having thirteen local government areas was purposefully selected for the study, being an educationally disadvantaged state. Also to ensure that the senatorial districts are equally represented in the study, a local government area was randomly selected from each district, making a total of three local government areas used for the study. Also, to avoid lopsidedness in the choice of school, the selected local government areas were stratified based on location (urban and rural) and then school type (public and private). 600 randomly selected students from thirty schools (200 from each local government area) were finally used for the study. Three research instruments were designed and validated for data collection and analysis.

1. Students' Perception Questionnaire (SPQ)
2. Learning Styles Questionnaire(LSQ)
3. Mathematics Learning Task (MLT)

Students' Perception Questionnaire (SPQ),a twenty item questionnaire on a four point Likert scale, was adapted from Satomi (2009) and Tugba (2012) and designed to investigate students' perception/beliefs about the WASSC mathematics. Actions towards a phenomenon are usually guided by the perceived and believed importance associated with it. This scale will therefore measure student's beliefs/perceptions in the domains of importance, fairness, difficulty level, examination malpractice and procedures concerning the WASSCME. The likert response format: strongly agree, agree, disagree and strongly disagree was adopted and scored 4, 3, 2 and 1 respectively.

Learning Styles Questionnaire (LSQ), an eighteen item questionnaire on a four point Likert type scale was adapted from Yahya et al (2014) and designed to measure students learning styles in preparation for the WASSC Mathematics Examination. Statements from this questionnaire reflect students preferred learning styles, strategies and activities. Response mode is in the form, very true of me, true of me, not true of me, not very true of me, and will be scored 4, 3, 2, and 1 respectively.

Mathematics Learning Task, (MLT) is a validated 13 Essay item Mathematics task that was used to elicit information concerning the depth of students leaning. The Essay type task were chosen to enable the researcher measure students cognitive ability in the various topics outlined in the senior secondary school Curriculum. Completing an assigned task enabled the researcher to evaluate students' depth of learning. The items are adopted from the 2012, 2013, 2014, 2015 and 2016 West African Senior Secondary Certificate

Mathematics Examination questions and were scored using the WAEC analytical method of grading. The maximum obtainable mark for each student on the entire test is 100%.

Validation of Instruments

The instruments were administered to 50 Senior Secondary three (SS3) students of equivalent status as those used in this study to ascertain internal consistency, and reliability coefficient was calculated using Cronbach Alpha Reliability Analysis. 20 items out of 32 of SPQ and all 18 items of LSQ were found to be valid. The reliability coefficients are 0.771 and 0.882 for SPQ and LSQ respectively

Inter-rater reliability procedure was used to validate the scores of the MLT. The researcher administered the test to 50 students of equivalent status as those used in this study. Students' scripts were photocopied and given out for marking to two examiners who are experienced in marking Mathematics in the WASSCE. Scores from the two examiners and the researcher were correlated to establish inter-rater consistency which was found to be 0.893. All negatively worded items were reversed before actual analysis of research data.

III. RESULTS PRESENTATION AND DISCUSSION OF FINDINGS

Data collected were analyzed using correlation and multiple regression models. The results are presented in the order in which the research questions were stated.

Research question 1

What kind of relationship exists between each of the predictors (students' perception and students' learning styles) and the criterion variable (students' learning depth in Mathematics)?

Table 1

S/N	Variable	N	Mean	SD	R	Significance
1	**Students Perception of the WASSCME**	**500**	**52.6440**	**6.61125**	**-0.164**	**0.00**
2	**Students' Learning Style**	**500**	**57,8880**	**8.93998**	**-0.097**	**0.031**
3	**Students Learning Depth in Mathematics**	**500**	**26.5420**	**16.37463**		

Table 1 above presents the correlation analysis on the relationship that exists between each of the predictors (students' perception of high-stakes mathematics examination and their learning styles) and the criterion variable (students' learning depth of high-stakes Mathematics). Investigation using Pearson Product Moment Correlation analysis shows that there was a low negative but significant correlation between each of the predictor variables and the criterion variable. Students' perception ($r = -0.164$, $p < 0.05$) and learning styles ($r = -0.097$, $p < 0.05$).

Research question 2

What is the composite contribution of the independent variables (students' perception and students' learning styles) to the prediction of the dependent variable (students' learning depth?)

Table 2: Model Summary and ANOVA

R = 0.170

R square = 0.029

Adjusted R square = 0.025

Table 2

Model	Sum of Squares	DF	Mean Squares	F	P	Remarks
Regression	3860.474	2	1930.237			
Residual	129935.644	497		7.383	0.001	S
Total	133796.118	499	261.440			

S = Significant

Table 2 presents the model summary and regression ANOVA shows that the combination of the predictor variables; students' perception of high-stakes mathematics examination and students' learning styles have a multiple correlation of 0.170 with students learning depth. The combination of these variables explains 2.9% of the variance in students learning depth in Mathematics as indicated by the coefficient of determination, $R^2 = 0.029$. Verification of significance using regression ANOVA produced $F_{2,497} = 7.383$ indicating that, there is a joint influence of the predictor variables on students learning depth in Mathematics and it is statistically significant.

Research question 3

What is the relative contribution of the independent variables (students' perception of high-stakes mathematics examination and students' learning styles) to the prediction of the dependent variable (students' learning depth?)

Table 3.3

Summary of regression for the relative contribution of the independent variables to the prediction of the student' learning depth

Model	Unstandardized Coefficients		Standardized Coefficient		
	B	Std. Error	Beta	t	Sig.
(Constant)	50.937	6.521		7.811	.000
Students' Perception	-.366	.116	-.148	-3.158	.002
Students' Learning Styles	-.089	.086	-.048	-1.034	.302

Table 3 shows that students' perception of the West African Senior Secondary Certificate Mathematics Examination is the most potent factor in predicting students' learning depth (Beta =-0.148, t =0.002, P<0.005). Students' learning style is not a potent predictor of students' learning depth.

Discussion of findings

Findings from this study reveal that there is a low negative but significant relationship between students' perception of the WASSCME and their learning depth in mathematics' as presented on table 1. This implies that the more positive, students' perceive the Examination in question, the less likely will they have increase in their learning depth. This finding could be attributed to the fact that their strong positive perception concerning the fairness, difficulty level and examination procedures led them into surface and shallow preparation which consequently affected their learning depth. Again, ignorance of marking procedures may likely make overconfident and zealous students ignore important steps in solving, thereby loosing marks. This result contrasts the findings of Green (2003), Satomi (2009), Etuk et al (2013) and Madaus (1988) who discovered that positive beliefs and perceptions led to positive washback while negative beliefs and perceptions led to negative washback.

Furthermore, findings also lay credence to the fact that students' learning styles having a low negative but significant relationship with their learning depth is an indication that learning styles adopted by students preparing for high-stakes mathematics examination rarely lead to an increase in their learning depth. This result supports that of Tsagari D. (2011), Morrison and Tang (2002) who discovered that examination influenced learning often lead to drill, rote learning and memorization, superficial learning, student passivity, cheating and spoon-feeding. They concluded that tests and examinations were demotivating and did not guarantee long-term or in-depth learning.

Findings based on Research questions 2 and 3 reveals that students' perceptions of the West African Senior Secondary Certificate Examination and their learning styles have a significant joint effect on their learning depth with a predictive power of 2.9% showing a very low prediction on students' learning depth in mathematics. However, since students learning style is not a potent predictor of students' learning depth as indicated on table 3 above, it can be deduced that the impact of this non-significant variable reduced the predictive value of the independent variables when joined together.

IV. CONCLUSION AND RECOMMENDATIONS

In view of the findings of this research, it can be concluded that students' positive perception of high-stakes WASSCME has no direct positive influence on their learning depth in Mathematics. Also, the learning styles adopted by students preparing for high-stakes Mathematics examination are detrimental to in-depth mathematical knowledge. Finally, the predictor variables do not allow a high and reliable prediction of the criterion variable because of the low predictive value.

Based on the research results, it is recommended that Learning styles that will lead to In-depth mathematical knowledge such as active learning strategy should be adopted by students preparing for the WASSCME. Also, further research be made to find out other variables that may allow a high and reliable prediction of students' mathematical learning depth in relation to examination washback and further studies be made on how to promote positive washback that will lead to in-depth mathematical knowledge.

Economic Implications

Testing is used to make important decisions such as selection, certification and promotion. Consequently, the average Nigerian student is most likely interested in the outcome of earning a certificate than in the inputs or efforts put in the learning process. Students are interested in acquiring the certificate at any cost in other to gain university admission, Teachers and schools also want credit and promotion for the excellent performance of their students, and parents also want cheap success for their children. This situation is a portrait of extrinsic motivation which describes the behaviour of learners who engage in learning because it is a means to an end that has little to do with the content of what is learned. No wonder the result of this study shows that learning styles adopted by students preparing for the WASSCME has an inverse relationship with students learning depth.

By implication, the nation will continue to have increase in enrollment of students' for the WASSCE because of increase in Mathematics failure rate. This is a colossal waste. Besides, the country will be flooded with half-baked graduates in all disciplines, whose contribution to national development will be minimal or insignificant.

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MATHEMATICS STUDENTS' QUESTIONNAIRE

SECTION A: BIO DATA

(1) Name of Student: ……...

(2) Name of School: .....

(3) School Type: (a) Private ( ) (b) Public ( )

(4) Student's Gender: (a) Male ( ) (b) Female ( )

(5) Class: ……

SECTION B: STUDENTS' PERCEPTION OF THE WASSC MATHEMATICS EXAMINATION

Instruction: Kindly express your views concerning the following statements by ticking the appropriate response (**To a very great extent, to a great extent, to some extent**, **to a little extent**) in the boxes provided below**.** Do not tick more than one box for a statement.

S/N	STATEMENTS	To a very great extent	To a great extent	To some extent	To a little extent
	In my view, the WASSC Mathematics Examination:				
1.	is a fair way of assessing Students' Mathematics ability.				
2.	results can be trusted.				
3.	scores will accurately reflect the quality of education i have received in my school.				
4.	is not an accurate measure of a student's mathematical ability.				
5.	result can accurately predict my future performance in the university.				
6.	do not indicate a student's level of Mathematical intelligence.				
7.	is unfair to students with low Mathematical ability.				
8.	should not be made compulsory to all students.				
	In my view, Mathematics:				
9.	is one of the most common subjects for people to study.				
10.	is a core subject in the school curriculum.				
11.	is very necessary for my success in life.				
12.	is not mandatory to furthering my education.				
13.	is a subject that demands special attention from students.				
14.	is necessary for my intellectual growth.				
15.	needs more time to learn than other subjects in the school curriculum.				
	In my view,				
16.	Mathematics is too difficult to pass at one sitting in the WASSCE.				

17.	the intellectual demand of mathematics in the SSCE is not too high.				
18.	to sit for the WASSC Mathematics, only students with high intelligence should be allowed.				
19.	senior secondary Mathematics should be made compulsory only for science students.				
20.	WASSC mathematics should be made simple by teachers while teaching.				

	I study for the WASSC Mathematics Examination by:	**Very Much Like Me**	**Just Like Me**	**Unlike Me**	**Very Much Unlike Me**
1.	solving problems from class notes.				
2.	working on many problems to understand Mathematical ideas.				
3.	memorizing formulae and procedures.				
4.	practicing questions from past examination papers.				
5.	discussing Mathematical ideas with classmates.				
6.	using the internet.				
7.	using examination revision guide to study.				
8.	writing out Mathematical formulae several times.				
9.	meeting my Mathematics teacher to correct my mistakes.				
10.	solving a lot of Mathematics practice test in class.				
11.	learning in group with my classmates.				
12.	actively participating in Mathematics class activity.				
13.	testing one another with predicted questions in my class.				
14.	practicing questions from Mathematics textbooks.				
15.	studying only Mathematics topics included in the syllabus.				
16.	revising every Mathematics content studied in the class.				
17.	studying how previous exams questions were set.				
18.	solving problems from Mathematics key points.				