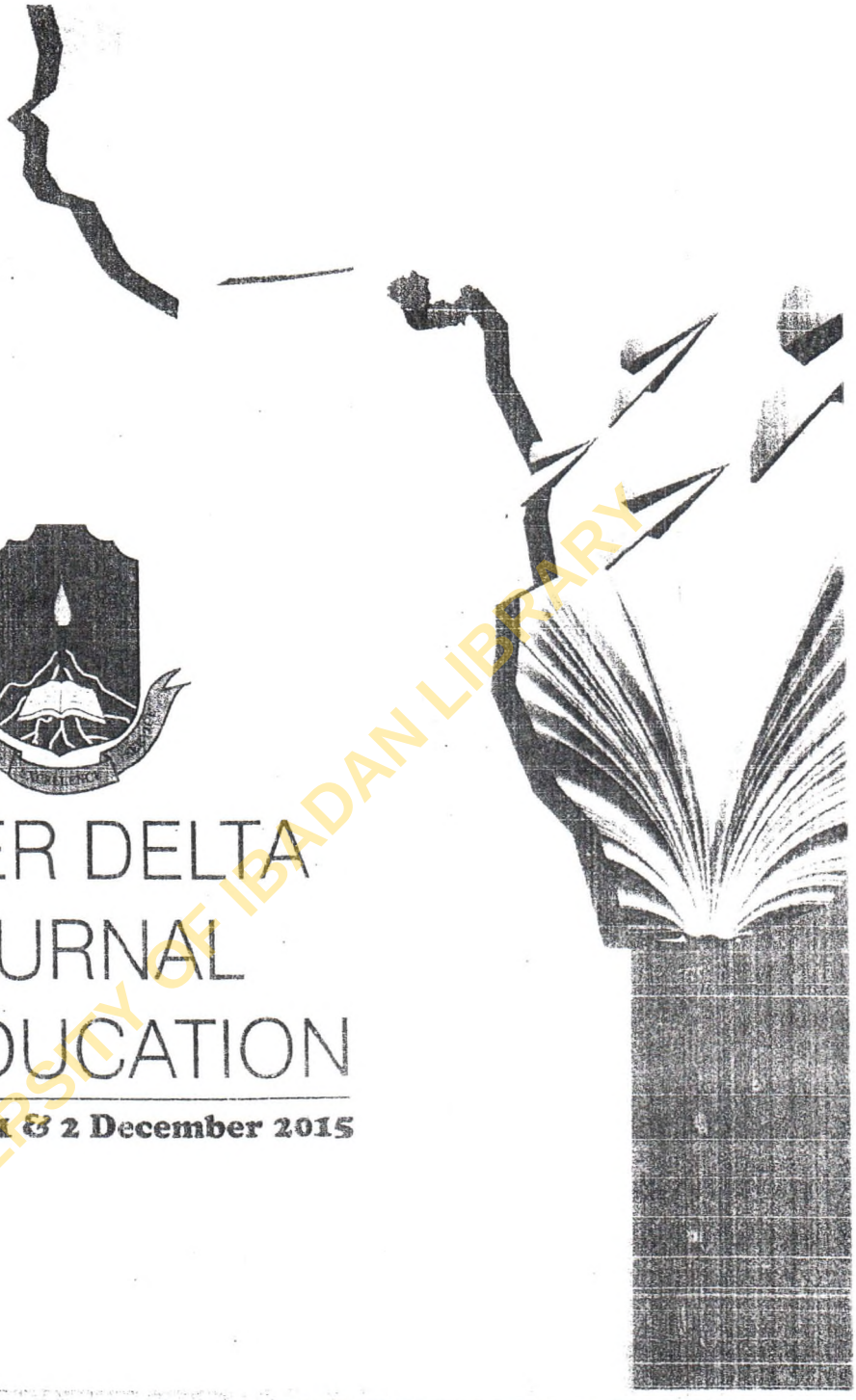

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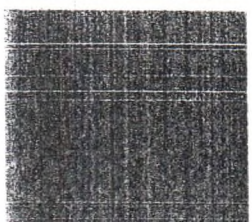

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EFFECTS OF TEST FORMAT, SELF-CONCEPT AND TEST ANXIETY ON RESPONSE CHANGING BEHAVIOUR AMONG SENIOR SECONDARY SCHOOL STUDENTS IN IBADAN LAND

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ABSTRACT

The study examined the effects of test format (multiple-choice, true or false and matching), self-concept and anxiety on response changing behaviour of senior secondary school students in Ibadan, Oyo State. Two hundred and eighty students in SSS 1 and 2 were tested on a 50-item Economics Achievement Test in three formats. Their answers were analyzed for response changes. Results indicated that while multiple-choice, matching and anxiety had significant influence on response changing, self-concept and true or false items did not.

Keywords: Test format, Self-Concept, Anxiety, Response Changing, Behaviour, and Test Score.

INTRODUCTION

The pressure to achieve (same as passing a test in flying colours), the fear of failure, coupled with expectations from significant others- school, parents and society, more often than not, may be responsible for candidates adopting different ad-hoc measures when writing a test; one of such being changing their hitherto chosen option. This action is termed response changing behaviour. Response changing behaviour is observed by the sighting of an erased initial response, a neat or rough cancelling of the response, or by the testee's indication of a changed response on an answer format formally provided by the tester. Changing answers therefore, in an examination is indicative of a number of issues, chief of which may include difficulty level of test item, self-concept and anxiety.

The general belief is that any student, who sits for a test must have undergone some level of tutelage by the teacher, would have prepared hard and as an average human being, expected success. When confronted with the realities of the test, however, and having chosen an option earlier, begin to make alterations; either neat or rough, thereafter picking another option. Research has it that though students often believe that the initial answer to a multiple choice question (MCQ) for instance, which comes to their mind is the best and that changing an answer, even when another answer option seems better upon reflection, does not lead to a better test score, but is rather detrimental to test performance. Recent studies have shown this to be a common misbelieve across different levels in various educational domains, Benjamin,

Cavell & Shallenberger, (1984); McMorris & Weidemann, (1986); Schwarz, McMorris & DeMers, (1991).

In other words, item response changing may not always be considered a bad action after all. However, it only becomes an issue when test format and certain personality variables like self-concept and anxiety are implicated as causative factors. Several studies dealing with answer changing suggest that students should be encouraged to explore their doubts and alter their answers, as they could thereby increase their test scores, provided they do not alter their answer more than once, McMorris, DeMers & Schwarz, (1987) and Geiger, (1991).

However, regarding the question whether students would or would not follow this advice, Foote and Belinky, (1972), as well as Prinsell, Ramsey & Ramsey, (1994), reported no relevant difference in the number of answer changes or gains from answer changing, before and after such instruction. However, Sutton (1982) reported not only significantly increased number of changes but a net gain after systematic instruction on answer changing.

A rather critical point of note in item response changing is test-wiseness. This is because, a test-wise student hardly changes his response, and if need be, his changes are expectedly minimal. Test-wiseness is the ability to use special strategies to select the correct response in multiple choice tests, without necessarily knowing the content or skill being measured. However, this does not preclude the item response changes. It is clearly evident in multiple choice tests; hence expectation is high, that there will be a strong relationship between test-taking skills and multiple choice test performance than with constructed response test performance (Edwards, 2003). Oakland and Weilert (1972) defined test-wiseness as the ability to manifest test-taking skills, which utilize the characteristics and formats of the test and or test-taking situation to receive a score commensurate with the ability being measured. It is therefore crucial to know that test-wise students will answer a question incorrectly only if they do not know the content, not because the test format is confusing or intimidating. In real terms, test-wise students rarely alter their options.

In undertaking any activity, be it academic or non-academic, a positive self-concept is considered a crucial necessity, and with examinations being high-stake activities, the need to determine whether or not the particular candidate believes in his or her ability is all but an important exercise. Self-concept is the totality of a complex, organized and dynamic system of learned beliefs, attitudes and opinion that each person holds to be true about his or her personal existence. Parental upbringing, continuous failure, depression and self-criticism remain critical in influencing the development of one's self-concept.

Gage and Berliner (1992) found that the relationship between self-concept and school achievement clearly suggests that measures of general or even academic self-concept are not significantly related to school achievement. It is at the level of very specific subjects (e.g., Reading, Mathematics, Science etc) that there is a relationship between self-concept and academic success. This depicts that success in a particular subject area is not really changing one's self-concept but rather is impacting one's expectation about future success based on one's past experiences.

If self-concept is seen as a serious causative factor of response changing behaviour, then anxiety is likely to be synonymous with self-concept. Due to the fear of failure, and not wanting to come short of expectations from significant others, students may develop a cold feet in an apparent display of anxiety. Barlow (2002) explained that anxiety is a future oriented mood

state associated with preparation for possible upcoming negative events. This view of anxiety is comparable to an animal's predatory imminence to continuum.

That is, anxiety corresponds to an animal's state during a potential predatory attack. Fanselow and Lester (1988) added that anxiety corresponds to an animal's state during predator contact or imminent contact, while Lang (1968) classified symptoms of anxiety into a system of three-responses: verbal-subjective, overt motor acts, and somato-visceral activity. Afolabi (2007) reported that Mueller and Schwedel (1975) related anxiety to response changes, discovering that the high anxious groups made the most number of changes and had the most gains. Morris and Leonard (1976) were also reported to have followed the result up, though detected contradictory relationships. In their study, it was found that those who profited from changes were the low anxious, while in another group in the same study, those profiting from changes were the high anxious. Subjects in each group ranged in number from 17 to 40. Prinsell et al. (1994) obtained similar results.

The scholastic belief (backed by several researches) is that students who change their options might have experienced a high test anxiety level. To them, the fear of failure, phobia for the subject in question or other anxiety causative factors may be responsible for their action. Despite literature being dedicated to examining the effect of test format, self-concept and anxiety on response changing behaviour, with emphasis on whether or not these personality variables and test format have a direct impact on overall test performance, and with Afolabi (2007) concentrating efforts on final year students who took a course in counselling psychology, it is now apt and indeed necessary to find out if the conclusions reached by such studies are true for other category of students. In this case, senior secondary school students, as well as consider if the introduction of a new test format, in this case, matching, significantly alters results generated in previous researches.

When critically considered, a student for instance, may change his option due to the difficulty of the test. Some tests, most especially power tests are structured to have a high difficulty index. This, test constructors agree, is to separate the wheat from the chaff, the high-flyers from the little- brained. Hence, in such high-stake examinations, test items are often very difficult, having been so constructed to cover the entire syllabus, which in most cases is wide.

To worsen matters, such tests, often set in multiple choice formats, in a bid to cover a larger percentage of the syllabus, if not all, are regarded as difficult, especially for students who are ill-prepared, have a poor self-concept or are plainly test anxious. The so-called little brained may see such examinations as a hard nut to crack. Whatever groups these students belong, frequent response changing behaviour cannot but be exhibited.

For students with a battered self-concept, displayed by a total lack of confidence in personal effort, changing of options will be a fortress. Students, who believe they cannot 'do it alone', may frequently alter their options. Though they may know the correct answer, their lack of trust in personal effort will prompt them to make such decisions. The case of students like these are not helped when for instance, they have the benefit of seeing the answer chosen by a supposedly brilliant student. Funny enough, there are chances the option hitherto chosen by them was the correct one, but because of their poor self-concept, the decision to change the previous option is considered swiftly without delay.

In the inner recesses of their heart, the brilliant student cannot be wrong and results to change options. Closely related to response changing occasioned by copying the works of

others in the examination hall and a supposedly battered self-concept is that of a total lack of trust in one's abilities. Unlike just having a battered self-image, students who do not trust their abilities, decisively go into examination with the mindset of copying the works of others. To this set of students, their performance in the test is determined, not by their personal contribution, but by the aid received from 'helpers'. These 'helpers' directly or indirectly, overtly or covertly contribute to the quantum of answers changed in the final analysis.

The gravity of reasons highlighted above, in terms of being considered forms of examination malpractice cannot be as weighty as that of parents, invigilators, examiners, teachers and even school authorities who (ordinarily should be in the vanguard of waging a relentless war on examination malpractice) are now in the forefront of gross examination abuse. To ensure their students pass at all costs; some parents would exude pride in a child who has passed in flying colours and at a sitting, and the school from which the student graduated would have the honour to advertise such 'giant feat', with a view to boosting the reputation of the school as well as increasing her enrolment figures. Special centres have become the fad.

This study is an attempt at comparing the relative vulnerability of test item format and some selected personality variables on response changing behaviour. This would aid the examiner's decision on what type of test format to employ that will have the most resistance to test contaminants and further provide empirical evidence to assist in determining where emphasis should be placed in reducing errors on final test scores.

This work will therefore seek to generally examine the relationship between test format, self-concept, anxiety and response changing behaviour, and then specifically see the effect test format and these personality variables have on item response changing.

Statement of the Problem

Ordinarily, testees need not change their options in a test during their participation in the test. In the first instance, it is an indication of their high state of preparedness, a positive self-concept and a brewing sense of confidence. If they would however, it should be minimal.

Uncontrolled substitution of options through an erased initial response, a neat or rough cancelling of the response, or by the testee's indication of a changed response on an answer format formally provided by the tester, more often than not indicates among many possibilities, a poor self-concept and a high anxiety level.

Though all test-takers display some level of anxiety, it becomes debilitating when it interferes with scholastic ability. Furthermore, poor self-concept affects the overall functioning of the individual, with the tendency for poor performance in tests, very high.

Some test formats have also been found to promote a high probability of guessing with the resultant effect of item response changing. A continuation of this is capable of distorting a student's true knowledge and ability, as well as promoting factors that could contaminate test score.

It is therefore worthy, aside from analyzing the effects of test format, self-concept and anxiety have on response changing behaviour, to also proffer solutions that would not only aid effective test administration through the selection of suitable item format employed in testing but also improve by creating conducive psychological climate amongst students both before and during testing.

Purpose of the Study

Several researchers have found that it is very helpful for students to change their initial responses. With several authorities like Stoffer et al. (1977), Schwarz et al. (1991), Prinsell et al. (1994) and Kruger et al. (2005) agreeing to the profitability of doing so, not only to a class of students but also the generality of all who did so. Afolabi (2007) agreed that there is consistency in the fact that the more changes made, the more gains accrued. This is particularly true when the ratio of the number of response changes made to the number of items in the test is determined.

It further traced the effects of test format, self-concept and anxiety on response changing behaviour of four hundred undergraduates who took a course in Counselling Psychology, to determine that students tended to change their initial responses in true-false more than in multiple choice tests; that there was no significant difference in the frequency of response changes made in true-false or multiple choice tests by students who are low, moderate or high in self-concept, academic self-concept, and state anxiety; students who are moderate in trait or general anxiety tended to make more response changes than those who are low or high in trait anxiety.

It reported further that since response changing is capable of distorting a student's true knowledge and ability, teachers should take cognisance of the item format employed in testing, and the need to create conducive psychological climate amongst students both before and during testing. The desired end, it reported, is to control as much as possible factors that could contaminate test score.

It is therefore instructive to find out if the findings by Afolabi (2007) will be true for all categories of students, especially those in the senior secondary school. This is necessary because such students may have the tendency for a low self-concept and a high anxiety level due obviously to their relative ages (they are supposed to still be in their teenage years), expected to be lower than that of final year students adopted by Afolabi (2007).
Besides, the relative test-wiseness expected from final year university undergraduates, which predisposes them to being smarter in choosing options in objective tests, may be lacking in senior secondary school students.

This work will therefore seek to examine the effect of test format, self-concept and anxiety on response changing behaviour, with special focus on senior secondary school students.

Significance of the Study

This study attempts to compare the relative vulnerability of test item format and some selected personality variables on response changing behaviour. It is significant in a number of ways.

To students, it assists them in knowing that though response changing isn't bad after all, as it has been found to be profitable to all who did it in the past, it still shouldn't become habitual, as some high-stake examinations, especially those in the medical and allied health professions penalize for noticeable alterations.

To teachers, it assists them in deciding on the type of test format to employ that will be most resistant to test contaminants and further provide empirical evidence to assist in determining where emphasis should be placed in reducing errors on final test scores.

To parents, it gives them an insight into understanding their respective child's

personality variables as well as the challenges faced by that child in relation to sitting and passing examinations. This understanding would assist parents to care more for the success of their children, instead of placing the burden of unnecessary expectation on them.

Government at all levels, will find this study useful as it will one way or the other helps in the realization of the nation's overall educational objectives through assisting in the development of test items which are most resistant to contamination, as well as reduce error in the final test score.

Besides, the fact that personality variables are involved opens a vista of opportunity for counsellors to deploy their training to be of assistance to students in managing their self-concept and anxiety.

The general public will find this work useful because it contributes to the body of existing knowledge as above, thus enriching the knowledge base of the people. "No knowledge is a waste", goes the popular saying.

METHODS

The study adopted a descriptive research design of correlational type, with sample consisting of two hundred and eighty students. Instruments included a 50-item self-prepared Economics Achievement Test on the taught topics in three formats of Multiple-Choice, True or False and Matching (the test is prepared in accordance with Bloom's Taxonomy, wherein 38% of the items tested Knowledge, 18% Comprehension, 12% Application, 8% Analysis, 2% Synthesis and 22% Evaluation), Liu and Wang's (2005) Academic Self-Concept Questionnaire (ASCQ) and Discroll's (2007) Westside Test Anxiety Scale (WTAS) were used in collecting data. Three research questions were generated, with Correlation and Multiple Regression used for data analysis.

Research Question 1

What is the relationship that exists among test format, self-concept and test anxiety on response changing behaviour among participants?

Table1 Summary of Correlation Matrix Showing the Relationship Between the Independent and Dependent Variables Among Respondents

	Mean	StdDev	T/F Test	Matching Test	MCQ Test	Self-Concept	Test Anxiety	Response Changing
T/F Test	29.90	5.04	1.000					
Matching Test	23.02	13.86	0.106	1.000				
MCQ Test	21.58	8.23	0.197**	0.517**	1.000			
Self-concept	33.44	8.954	0.072	0.081	0.147*	1.000		
Test Anxiety	49.73	16.59	0.038	0.094	0.051	-0.033	1.000	
Response changing	7.56	8.38	0.036	0.351**	0.343**	0.023	0.149*	1.000

N.B: ** Significant at p<0.01 *Significant at p<0.05

The results from **Table 1** shows that response changing behaviour had significant correlation with matching test ($r = 0.351$, $p<0.05$), multiple choice question format ($r = 0.343$, $p <0.05$) and test anxiety ($r = 0.149$, $p<0.05$) of the respondents. However, response changing behaviour had no significant correlation with true/false test format ($r = 0.036$, $p>0.05$) and self-concept ($r = 0.023$, $p>0.05$) respectively.

Research Question 2

What is the composite contribution of test format, self-concept and test anxiety on response changing behaviour among participants?

Table 2: Summary of Regression Analysis of the Combined Prediction of Response Changing Behaviour among participants by the Five Independent Variables.

R	R Square	Adjusted R Square	Std. Error of the Estimate
0.417	0.174	0.159	7.68161

Table 2a: SUMMARY REGRESSION ANOVA

	Sum of Squares	Df	Mean Square	F	P	Remark
Regression	3407.01	5	681.40	11.55	0.000	Sig
Residual	16167.95	274	59.01			
Total	19574.97	279				

Table 2 shows the prediction of all the five independent variables to the dependent variable. That is, response changing behaviour among testees correlated positively with the three predictor variables. The **Table** also shows a coefficient of multiple correlation (R) of 0.417 and a multiple R square of 0.174. This means that 17.4% of the variance in the testees' response changing behaviour is accounted for by all the five predictor variables, when taken together. The significance of the composite contribution was tested at $p<0.05$ using the F- ratio at the degree of freedom ($df = 5/274$). The **Table** also shows that the analysis of variance for the regression yielded a F-ratio of 11.55 (significant at 0.05 level). This implies that the composite contribution of the independent variables to the dependent variables was significant and that other variables not included in this model may have accounted for the remaining variance.

Research Question 3

What is the relative contribution of test formats, self-concept and test anxiety on response changing behaviour among participants?

Table 3: Relative Contribution of the Independent Variable to the Dependent Variable (Test of Significance of the Regression coefficients)

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	-1.030	3.454		-.298	.766
True or False Test	-.061	.093	-.037	-.655	.513
Matching Test	.137	.039	.226	3.510	.001
Multiple choice Test	.235	.067	.231	3.530	.000
Self-concept	-.022	.052	-.023	-.417	.677
Test Anxiety	.159	.028	.116	2.103	.036

Table 3 reveals the relative contribution of the five independent variables to the dependent variable, expressed as beta weights. The partial correlation coefficients of test formats, self-concept and test anxiety have positive relationship with the response changing behaviour among participants. The positive value of the effects of test format, self-concept and test anxiety is actually determined by positive reinforcement of these five variables. Using the standardized regression coefficient to determine the relative contributions of the independent variables to the explanation of the dependent variable, multiple choice test ($B = 0.235$, $t = 3.530$, $p < 0.05$) is the most potent contributor to the prediction followed by the matching test ($B = 0.137$, $t = 3.510$, $p<0.05$), followed by test anxiety ($B = 0.159$, $t = 2.103$, $p<0.05$) followed by self-concept ($B = -0.022$, $t = -0.417$, $p > 0.05$) and finally followed by true/false test format ($B = -0.061$, $t = -0.655$, $p > 0.05$) in that order.

DISCUSSION

Results generated above clearly show that while test format and anxiety are implicated in item response changing behaviour, self-concept is not. This may be due to many reasons, some of which include the fact that most participants are not particularly used to matching as a test format, especially in Economics and so may have the tendency to continually alter their options. Besides, the perception of matching as a difficult test format, coupled with the fact that answers provided could actually be correct for other questions in the test too (depending on the difficulty level and discrimination index of the test), hence only those with a good grasp of the item may be comfortable answering it. The significant relationship with multiple choice items may be traceable to its susceptibility to frequent response changes, especially when item discrimination is low and distracters are close.

As for anxiety, it is an established fact that nearly all, if not all testees experience one level of anxiety or the other (Gilmer, 1978). This is because preparing for a test, writing it and the attendant pressure of passing it are all anxiety-inducing. Hence, no surprise there is a

significant relationship between it and response changing behaviour. Simply put, anxiety becomes worrisome only when it interferes with academic performance. This finding is also in line with that of Iroegbu (2013) who submitted that students with low anxiety were disposed to better academic performance than those with high anxiety. The finding also supports that of Samson and Stroops (1979), who discovered that high anxious students display a greater tendency of negative thoughts in evaluative situations than their low anxious peers. Part of this negative pre-occupation, they reported, often includes doubts on the correctness or appropriateness of their item responses, and consequent possible failure.

The rather insignificant relationship between self-concept and response changing behaviour may be due to the difficulty in measuring self-concept in relation to writing a single test, as it is a construct that develops over time, unlike anxiety, which is noticeable through numerous physical signs. However, this is not surprising as it falls in line with the findings of Gage and Berliner (1992), who discovered that measures of general or even academic self-concept are not significantly related to school achievement (response changing is often attributed to the desire to achieve). Though the duo admitted there exists some form of relationship between self-concept and academic success (which is somewhat the reason for response changing), they further held that success in particular subject area does not change one's self-concept but rather impacts one's expectation about future success based on one's past experience.

The only surprise though, is the not too significant relationship between true or false items and response changing behaviour. The true or false items being conventionally a proposition whose truth or falsity is to be indicated by the testee is expected to be more vulnerable to hasty decision-making. In fact, Gronlund (1985) held that true or false items are more susceptible to guessing than multiple choice items. This expectation may however not hold for participants in this study because of their belief that the answer already chosen was the correct one, as there was already a 50% likelihood of its correctness or otherwise. Besides, since the items were adapted from the multiple choice items, testwise students may have no problems picking the correct answer, hence, no need for response changing.

The joint contribution of the independent variables on the dependent variable corroborates Afolabi (2007), whose work revealed that jointly, test format and anxiety significantly relate with response changing behaviour, and that no difference exists in the performance of testees with low, moderate or high self-concept in relation to their response change, hence, no significant relationship between self-concept and response changing behaviour. This finding further proves that irrespective of the educational level of the student-whether university as in Afolabi (2007) or secondary school as in this study, the findings remain true.

That multiple choice items were the most potent contributors to response changing behaviour can be excused on the fact that most, if not all participants are used to it as a test format, hence would naturally be disposed to altering responses the way they will do in standard test situations. The popularity of multiple choice items, occasioned by its usefulness in assessing a variety of levels of thinking (Dickinson, 2011), has made it the format of choice for examiners, who use it to sample domain of knowledge covered and for certification purposes (Alonge 2004). Hence, if testees alter their responses when attempting multiple choice items, it should be seen as the norm rather than an exception.

The contributions of matching, test anxiety, self-concept and true or false item in that order, also goes to show the effect each has on response changing, as it were, albeit relatively.

CONCLUSION AND RECOMMENDATIONS

With findings already implicating test format and anxiety, and the opinion that response changing is capable of distorting a student's true knowledge and ability, teachers should take cognisance of the item format employed in testing, as well as the need to create a conducive psychological climate amongst students both before and during testing. The desire really is to control as much as possible factors that could contaminate test score, in this case, test format and anxiety.

Results from research on the effect of test format and selected personality variables can lead to more informed public policy and educational efforts that will help improve not only the performance of testees but also that of the standard of test writing. Specifically, examiners can be assisted in deciding on the type of test format to employ that will be most resistant to test contaminants and further provide empirical evidence to assist in determining where emphasis should be placed in reducing errors on final test scores. This no doubt will improve the reliability of generated test scores.

Also, this work will assist in understanding students' psychological make-up, especially as regards the pressure each of them asserts on the individual in test-taking situations. Students themselves can then be encouraged to prepare adequately, remain calm and confident during testing. Parents and teachers would thus recognize the need to place less pressure on their kids and students when writing a test but rather support them emotionally to do well.

Examination bodies and examiners in general will also need to begin to emphasise the psychological make-up of examinees rather than the general emphasis placed largely on cognitive performance alone. This study like others before it should further strengthened the belief that performance in tests is a function not only of cognition, but also of psychology.

Counselling psychologists, would further have a plank to base their theories on, as this work like others before it has shown the place of anxiety as an important factor in response changing. They should therefore, improve efforts geared towards reducing test anxiety in students.

Government is also encouraged to formulate policies that will improve the psychology of learners. Whether primary, secondary or tertiary, education can only be functional if it is aimed at not only improving the mental weight of learners but also their emotional balance.

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