

**NATURE AND PRACTICE OF TEST WISENESS**  
**THE CASE OF KENYAN SCHOOLS**

**BONFACE MUSAU MUTUA**

**UNIVERSITY OF NAIROBI  
VIKUYU LIBRARY**

**UNIVERSITY OF NAIROBI**  
**SCHOOL OF EDUCATION**  
**DEPARTMENT OF PSYCHOLOGY**

**©2012**

**A RESEARCH PROJECT SUBMITTED TO THE BOARD OF POST  
GRADUATE STUDIES IN PARTIAL FULFILLMENT FOR THE AWARD OF  
MASTER OF EDUCATION IN MEASUREMENTS AND EVALUATION,  
SCHOOL OF EDUCATION, UNIVERSITY OF NAIROBI.**


©2012

**COPYRIGHT**

*All rights are reserved. No part of this work may be reproduced, stored in a retrieval system or transmitted in any form or means, electronic, mechanical, photocopying, recording or otherwise without prior written permission of the author or the University of Nairobi.*

## DECLARATION

This Research project is my original work and has not been presented for any academic award at any other University.

Signed: -----  -----

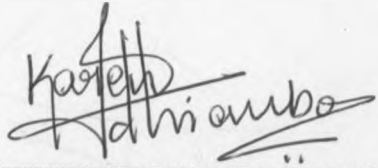
Date: ----- 27/11/12 -----

**Bonface Musau Mutua**

**Reg. No. E58/74321/2009**

### Supervisor's Declaration

This project has been submitted for examination with my approval as University Supervisor.

Signed: -----  -----

Date: ----- 27<sup>th</sup> Nov'2012 -----

**Dr. Karen T. Odhiambo**

**Department of Psychology- Education Psychology**

**University of Nairobi**

## **DEDICATION**

This work is dedicated to my parents Mr & Mrs Jones Solly who took me to school up to the undergraduate level where I was given the power to read. I have started reading.

Thank you and God bless you abundantly.

## ACKNOWLEDGEMENT

I wish to first and foremost thank my supervisor and course co-ordinator, Dr Karen Odhiambo for her professional and keen guidance that she gave me towards completion of this project. Thank you for assisting me become a better test specialist.

I also wish to thank all the principals and teachers of the schools I visited for assisting me during my data collection. Some, even undertook to administer the research instruments during night preps. Thank you very much.

Finally, I wish to sincerely thank my family especially my dear wife Marietta for her support and patience with me. To my children Mercy and Angel, for being contented with my answers when you asked me where I was going every time I was attending my holiday classes.

## ABSTRACT

The skills that tests attempt to measure are not directly observable, but must be elicited by an observable tool (test). The decision on an individual's ability depends on the information gathered or the competence of this tool. However, independent factors, which are not supposed to be involved in the ability measured, may obstruct or contribute to the information required by this tool. One of these factors is test-wiseness.

Test wiseness is defined as a subject's capacity to utilize the characteristics and formats of the test and/or the test-taking situation to receive a high score. It is logically independent of the examinee's knowledge of the subject matter for which the items supposedly measure." Basically then, test wiseness suggests a cognitive ability (or abilities) that one may employ on a variety of tests, regardless of the nature of the tests' subjective content. Millman et al. developed test wiseness taxonomy which has since been adopted as a conceptual framework for the construct of test wiseness. It's development consisted of a synthesis of the literatures of test construction principles, and problem solving styles of examinees. Test wiseness encompasses both the method of measurement (tests testing situation), and characteristics of examinees (states-traits)

The first half of the outline contains principles of test wiseness which are independent of the test-creator or test purpose. The elements presented here are applicable in most testing situations, regardless of previous exposure (or a lack of it) to either the test-maker, or other tests with a similar purpose. The first subdivision suggests time-using strategies

to implement on those tests which restrict the time allotted the test-taker. The points listed here are guidelines to optimal management of time, intended to prevent a loss of points for a reason other than lack of knowledge of test content. Similarly, the second subdivision presents rules of thumb to avoid minor mistakes, so that the examinee is not penalized for his or her carelessness.

The third and fourth subdivisions deal with guessing and deductive reasoning strategies which allow the test-taker to gain points beyond those attained on the basis of knowledge of the subject matter. Successful deductive reasoning is dependent on some knowledge of the tested material. However, the correct answer is not known without the presence of other choices, or questions, to serve as cues in the reasoning process.

The study aimed at investigating test wiseness with a view to determining the nature of the construct and if it's practiced. The population of the study included all secondary school students and teachers in Machakos district schools. Stratified random sampling was used. The researcher adopted an exploratory approach and used a descriptive survey design to investigate the nature and practice of test wiseness. Descriptive survey design was intended to produce statistical information about aspects of test wiseness that may interest policy makers and educators. A total of 30 teachers and 180 students were selected to participate in the research. The instrument for this study was a self reported confidential survey that measured application of test wiseness skills and demographics. Analysis was done using SPSS. Descriptive statistics included computing means, frequencies and standard deviation. Tables and graphs were used to present the results. It

was found that majority of the students indicated that they had never heard of test wiseness. However they applied the construct. An overwhelming 90% of the teachers had never heard of test wiseness but surprisingly a majority practiced test wiseness skills. The teachers were very keen in guiding their students on error avoidance skills more than any other skill.

The findings of this study indicate that the Kenyan secondary students practiced test wiseness skills. Therefore, a repeat study could also be conducted with tertiary level students.

Further research is recommended to be done on test wiseness elements which are dependent upon the test constructor or the test purpose. These involve consideration of the intent of the question and the recognition of cue-using strategies which may have been inadvertently adopted by the test constructor e.g KNEC.

Further research should also be done to investigate teachers' attitudes toward the teaching of test-wiseness skills or the evaluation of test-taking strategy competence in teachers. Given that tests are increasingly being administered using ICT, corresponding test-wiseness skills will inevitably develop. It is therefore suggested that more research be conducted to expand the taxonomy of test-wiseness.



# TABLE OF CONTENTS

DECLARATION .....	iii
DEDICATION.....	iv
ACKNOWLEDGEMENT .....	v
ABSTRACT .....	vi
TABLE OF CONTENTS .....	ix
LIST OF ABBREVIATIONS & ACRONYMS.....	xiii
LIST OF TABLES.....	xiii
LIST OF FIGURES .....	xiv
<b>CHAPTER ONE: INTRODUCTION.....</b>	<b>1</b>
1.1 Background.....	1
1.1.1 Taxonomy of Test wiseness.....	5
1.2 Statement of the Problem.....	6
1.3 Purpose of the Study .....	7
1.4 Objectives of the study .....	7
1.5 Research Questions.....	7
1.6 Research Hypotheses .....	8
1.7 Significance of the Study.....	8
1.8 Justification of the Study .....	8
1.9 Scope and Delimitations of the Research .....	9
1.10 Definition of Terms .....	9

UNIVERSITY OF NAIBAL  
'AKUVII I IRDADY

<b>CHAPTER TWO: LITERATURE REVIEW.....</b>	<b>11</b>
2.0 Introduction.....	11
2.1 Related Studies .....	11
2.1.1 Test wiseness training.....	12
2.1.2 Manifestation of test wiseness .....	13
2.1.3 Test taking experience .....	14
2.1.4 Type of Items .....	14
2.1.5 Correlates of Test-wiseness .....	15
2.2 Related Literature .....	18
2.2.1 Definitions of Test-Wiseness.....	18
2.2.2 The Taxonomy of Test- Wiseness Principles .....	19
2.2.3 Theoretical Approaches to Test wiseness.....	24
2.2.3.1 Test wiseness as due to faulty test construction .....	25
2.2.3.2 Test wiseness as due to the general mental ability of the test taker .....	25
2.2.3.3 Testwiseness as a factor of the nature of the test, the test situation and the examiner .....	26
2.3 Conceptual Framework.....	27
 <b>CHAPTER THREE: METHODOLOGY .....</b>	 <b>30</b>
3.0 Introduction.....	30
3.1 Population .....	30
3.1.1 Population Sampling.....	30
3.2 Research Design .....	30

3.3 Research Instruments.....	31
3.4 Data Collection .....	32
3.5 Ethical Considerations .....	32
3.6 Data Analysis.....	32
<b>CHAPTER FOUR: DATA ANALYSIS AND INTERPRETATION .....</b>	<b>33</b>
4.0 Introduction.....	33
4.1 Questionnaire Return Rate and Demographic information .....	33
4.1.1 Questionnaire Return Rate.....	33
4.1.2 Demographic information.....	35
4.2 Data Analysis.....	38
4.2.1 objective 1 .....	38
4.3.2 Objective 2.....	40
4.3.3 Objective 3 .....	47
<b>CHAPTER FIVE: INTERPRETATION, CONCLUSIONS AND</b>	
<b>RECOMMENDATIONS .....</b>	<b>54</b>
5.0 Introduction.....	54
5.1 The extent to which students apply elements of test wiseness .....	54
5.2 The extent to which teachers apply elements of test wiseness. ....	56
5.3 Recommendations for further research.....	57
<b>REFERENCES .....</b>	<b>59</b>

<b>APPENDICES.....</b>	<b>64</b>
Appendix A: Consent form.....	64
Appendix B: Teacher’s Questionnaire.....	65
Appendix C: Student’s Questionnaire .....	69
Appendix D: Taxonomy of Test-wiseness Principles .....	73

## LIST OF ABBREVIATIONS & ACRONYMS

<b>KCPE</b>	-	Kenya Certificate of Primary Education
<b>KCSE</b>	-	Kenya Certificate of Secondary Education
<b>KNEC</b>	-	Kenya National Examinations Council
<b>SPSS</b>	-	Statistical Package for Social Sciences
<b>JAB</b>	-	Joint Admissions Board
<b>SAT</b>	-	Scholastic Aptitude Test
<b>ICT</b>	-	Information Communication Technology

## LIST OF TABLES

Table 4.1: Response Rate .....	34
Table 4.2: Gender of the Students .....	36
Table 4.3: Distribution of Students by Nature of School .....	37
Table 4.4: Students Response on whether they had heard of Test Wiseness .....	39
Table 4.5: Students' Agreement with Statements on time using strategies.....	41
Table 4.6: Students' agreement with Statements on Error avoidance Strategies .....	42
Table 4.7: Students' agreement with Statements on Guessing strategies.....	44
Table 4.8: Students' Agreement with statements on Deductive reasoning strategies .....	45
Table 4.9: Teachers' Agreement with statements on time using strategies.....	47
Table 4.10: Teachers' agreement with statements on error avoidance strategies.....	49
Table 4.11: Teachers' agreement with Statements on Guessing strategies .....	50
Table 4.12: Teachers' Agreement with statements on Deductive reasoning strategies .....	52

## LIST OF FIGURES

Figure 2.1: Conceptual Framework .....	29
Figure 4.1: Gender of Teachers .....	36
Figure 4.2: Knowledge of Test Wiseness by teachers .....	38
Figure 4.3: Knowledge of Test Wiseness by students .....	39
Figure 4.4: students' agreement with statement on time using strategies .....	41
Figure 4.5: Students' agreement with Statements on Error avoidance Strategies .....	43
Figure 4.6: Students' agreement with Statements on Guessing strategies .....	44
Figure 4.7: Students' Agreement with statements on Deductive reasoning strategies .....	46
Figure 4.8 Teachers' Agreement with statements on time using strategies .....	48
Figure 4.9: Teachers' agreement with statements on error avoidance strategies .....	49
Figure 4.10: Teachers' agreement with Statements on Guessing strategies .....	51
Figure 4.11: Teachers' Agreement with statements on Deductive reasoning strategies .....	53

## CHAPTER ONE: INTRODUCTION

### 1.1 Background

The theoretical work of Millman, Bishop, and Ebel (1965) is regarded as the classic in the area of test-wisness. They defined test-wisness as a subject's capacity to utilize the characteristics and formats of the test and/or the test-taking situation to receive a high score.

The construct of test-wisness (TW) has a relatively long history in educational research. Originally suggested as a possible effector of reliability (Thorndike, 1951), it has since become a frequently used term, but one not without its problems of interpretation. Early confusion over the precise components and functioning of test wisness stemmed from the fact that although most test-constructors testified to its existence, no empirical research was performed to thoroughly examine the construct.

Thorndike's pioneering discussion of test wisness classified it as a possible source of variance in test scores, and described it as a persistent general trait of the test-taker. Although he did postulate possible characteristics of the test-wise individual, Thorndike's brief treatise of test wisness was descriptive in nature, and did not suggest any specific directions for research.

In providing the first thorough empirical investigation of test wisness, Gibb (1964) illustrated the dearth of research, by claiming that the most complete reference on the



subject was the early work of Thorndike (1951). However, Gibb's own work altered that circumstance. In examining individual differences in test wiseness skills, he provided an operational definition of test wiseness, and also developed an instrument to measure the construct. Gibb's important research was soon followed by what is regarded as the classic theoretical work in the area.

Millman, Bishop, and Ebel (1965) presented a comprehensive taxonomy of test wiseness intended to serve as a framework for future empirical study. The success of their endeavor is evidenced by the large amount of research appearing subsequent to the Millman et al. (1965) article. Within the last decade, test wiseness has received considerable attention in the professional literature. Not only has it been examined as a source of additional variance in test scores, but test wiseness has also been investigated in terms of its components (Nilsson & Wedman, 1974), correlates (Diamond & Evans, 1972), measurement (Millman, 1966), teachability (Oakland, 1972), and application (Ford, 1973). As a result of these and other empirical analyses, test wiseness is widely recognized as a source of additional variance in test scores and as a possible depressor of test validity

Test-wiseness is logically independent of the examinee's knowledge of the subject matter for which items are supposedly measuring. It is restricted to the actual taking of (not preparing for) objective achievement and aptitude tests.

Their outline of test-wiseness or test-taking principles includes elements independent of the test constructor or of the test purpose such as appropriate time using strategies, careful attention to directions, careful checking of answers, as well as the use of guessing and deductive reasoning strategies.

More sophisticated test wiseness principles include those elements which are dependent upon the test constructor or the test purpose. These involve consideration of the intent of the question and the recognition of cue-using strategies which may have been inadvertently adopted by the test constructor. These principles may prove beneficial when the test taker has knowledge of particular test making behaviors or knowledge of particular testing practices gained from past experiences with tests similar in purpose and format.

Less sophisticated principles include elements that are independent of the test maker or test purpose. If employed, these strategies will help examinees avoid losing points for reasons other than lack of knowledge of the content tested. Other researchers besides Alley and Deshler have advocated adopting a learning-strategies format for instruction in various academic areas, including test taking.

Armbruster, Echols, and Brown (1983) defined strategies as "student activities to enhance test processing and memory" (p. 17). They stressed the importance of making a clear distinction between techniques and strategies, with a technique becoming a strategy only when students know when, where, and how to use it.

Similarly, Dansereau (1978) warned against focusing instruction on specific methods that do not lend themselves to a wide range of application. In fact, he suggested that teaching of situation-specific methods actually discourages students from developing and exploring new strategies, and limits their awareness of their cognitive capabilities.

Weinstein (1982) concurred in the belief that learning strategies offer a viable approach for teaching students to become more effective learners, independent of specific content. A learning-strategies model offers a problem-solving approach that is not restricted to applications specific to the context in which the strategy is taught. Rather, a learning-strategies model facilitates generalization of a strategy across tasks and settings (Alley & Deshler, 1979).

Such programming for generalization has been advocated by Baer (1979), Kuhn (1974), Stokes and Baer (1977), and Wildman and Wildman (1975). This approach also readily lends itself to being an ideal model for teaching test-wisness skills when using the definition proposed by Millman et al. (1965), which focuses on using the characteristics and formats of the test and/or the test taking situation to receive a high score.

Surprisingly enough, test wiseness spans the broadest age range possible. At one end of the spectrum is the preschool child, and at the other end adults. Gaines and Jongsma (1974) postulated that test wiseness could be taught to preschool subjects. Moving up the age continuum, grade school children have exhibited test-wise skills in a number of

studies (Ardiff, 1965; Callenbach, 1973; Diamond & Evans, 1972; Gaines & Jongsma, 1974; Kreit, 1968; Nilsson, 1975).

Similar test-wise talents have been demonstrated by junior and senior high school students (Crehan, et al., 1974; Gross, 1976; Slakter et al., 1970a, 1970b; Wahlstrom & Boersma, 1968), and by college students (Gaier, 1962; Pryczak, 1973; Sax & Carr, 1962). Completing the age range, Bajtelsmit (1975a, 1975b) and Woodley (1973) taught adult subjects to use test wiseness elements profitably on multiple-choice tests. It may be concluded then, that test wiseness abilities are characteristic of all age groups.

### **1.1.1 Taxonomy of Test wiseness**

The taxonomy of Millman et al. (1965) reproduced in Figure 2.1, has been adopted as a conceptual framework for the construct of test wiseness. The authors of this taxonomy noted that its development consisted of a synthesis of the literatures of test construction principles, and problem solving styles of examinees. The fact that test wiseness encompasses both the method of measurement (test taking situation), and characteristics of examinees (states-traits), indicates that test wiseness is indeed a factorially complex construct (Woodley, 1973).

The first half of the outline contains principles of test wiseness which are independent of the test-creator or test purpose. The elements presented here are applicable in most testing situations, regardless of previous exposure (or a lack of it) to either the test-maker, or other tests with a similar purpose. The first sub division suggests time-using strategies

to implement on those tests which restrict the time allotted the test-taker. The points listed here are guidelines to optimal management of time, intended to prevent a loss of points for a reason other than lack of knowledge of test content.

Similarly, the second subdivision presents rules of thumb to avoid minor mistakes, so that the examinee is not penalized for his or her carelessness. The third subdivision deals with guessing strategies. Unlike the two categories discussed above, guessing techniques allow the test-taker to gain points beyond those attained on the basis of knowledge of the subject matter. Millman, et al. (1965) noted that if examinees wish to maximize their test scores, use of an appropriate guessing strategy is a viable means of doing so.

## **1.2 Statement of the Problem**

There are two ways to avoid bias against students who have not learned to respond successfully to item writing faults (secondary cues). The first is to construct tests that are free from secondary cues. The second is to teach all students a cue-using strategy in order to equalize this knowledge among all groups.

Ebel (1965, p. 206) warned that even "if the test is a good measure of achievement, one which tests command of knowledge, and if it is free of technical flaws, more error in measurement is likely to originate from students who have too little, rather than too much, skill in taking tests."

Therefore, the study aimed at investigating whether teachers and students are aware of the concept of test wiseness and if they practice the skills.

### **1.3 Purpose of the Study**

The purpose of the research is to investigate test wiseness with a view to determining it's practice.

### **1.4 Objectives of the study**

- i) To investigate whether both teachers and students have knowledge of test wiseness, knowingly and unknowingly.
- ii) To investigate the extent to which students apply elements of test wiseness. , delete....that is, time using strategies, error avoidance strategies, guessing strategies and deductive reasoning strategies.
- iii) To investigate the extent to which teachers apply elements of test wiseness.
- iv) Come up with ways in which the construct can be incorporated to enhance learning and teaching

### **1.5 Research Questions**

- i) Do the respondents have knowledge of the construct of test wiseness?
- ii) Do the students practice test- wiseness skills?
- iii) Do the teachers practice test wiseness skills?

## **1.6 Research Hypotheses**

- i) Many secondary school students and teachers do not have knowledge of test wiseness.
- ii) Many secondary school students do not practice test wise strategies.
- iii) Many secondary teachers do not practice test wise strategies.

## **1.7 Significance of the Study**

Since KCSE is a very important tool in placement of students to Universities and other tertiary colleges, it is important for all the stake holders right from the Ministry of Education, the Kenya National Examinations Council (KNEC), the school, the teacher and the student to know if test wiseness is applied and practiced.

Since KCSE scores are used as the criterion on admission by Joint Admission Board (JAB), KCSE has produced a substantial side effect, known as backwash effect (Hughes, 1989). Classroom pedagogy, curriculum development, and language assessment, have been shaped to "fit" the format and content of the KCSE. Both students and teachers may start appreciating some test wise skills and this may have a positive backwash effect on learning, pedagogy and classroom testing.

## **1.8 Justification of the Study**

The research was relevant in the context of education because it gathered broad knowledge on test wiseness in order to enable educators understand the intricacies behind

test wiseness from the point of view of the candidate and the examiner. It is important that we do not end up with excellence minus competence.

Shivonje (2010) asserts that performance contracting means mandating test results to be used automatically for decision making, so we need to have knowledge on what considerations to make before embarking on such judgments.

### **1.9 Scope and Delimitations of the Research**

The study was focused mainly on knowledge of test-wiseness by secondary school teachers and students and their application of one part of the construct which deals with elements of test wiseness elements independent of the test maker or test purpose. Other related issues such as susceptibility of test-wiseness in items, coaching effects, practice effects, backwash effects, academic predictability of the exams, analysis and generalization of common cognitive procedures that people usually take when responding to a test item and the dimensionality of test-wiseness were beyond the scope of the present study. The research was conducted in Machakos district and hence the findings may not reflect test wiseness practices in the rest of the country.

### **1.10 Definition of Terms**

For the purposes of this study, the definitions of following terms were used:

**Test-wiseness:** It is also called test-taking strategies/skills, test-sophistication, test familiarity, test-taking orientation, and test-wisdom. It is defined as "a subject's capacity



to utilize the characteristics and formats of the test and or test-taking situation to receive a high score" (Millman, Bishop, & Ebel, 1965, p.707).

**Test-wise:** individuals who possess a substantial amount of test-wiseness and, more specifically, whose score is approximately one standard deviation above the mean on the Test of Test-wiseness (TTW; Rogers & Bateson 1991 a).

**Test-naive:** individuals who are deficient in test-wiseness and, more specifically, who receive a score approximately one standard deviation below the mean on the TTW (Rogers & Bateson, 1991 a).

**Partial knowledge:** knowledge possessed by an examinee which is relevant to the subject area being measured but insufficient for her or him to determine the correct answer alone when responding to a relevant test item.

**Content-free items:** items whose content was deliberately set up to be either non-sensical, trivial, or beyond the examinee's cognitive ability so that the correct answers could only be arrived at through application of specific test-wiseness skills, rather than through knowledge of specific subject material (Sarnacki, 1979; Bajteismit, 1975; Crehan et al.,1974; Slakter et al., 1970; Woodely, 1973).

**Educated guessing:** to eliminate one or more options as incorrect through the application of both test-wiseness skills and the partial knowledge of the test content and then to guess randomly from among the remaining options.

**Standardized Tests:** formal tests that have uniform procedures for administration and scoring. The test manual prescribed specific instructions to be given to the test takers and a prescribed time to be allocated for the total test. Also, the scoring is completed according to exact procedures (Stevenson, 1991).

## CHAPTER TWO: LITERATURE REVIEW

### 2.0 Introduction

The skills that tests attempt to measure are not directly observable, but must be elicited by an observable tool (test). The decision on an individual's ability depends on the information gathered or the competence of this tool. However, independent factors, which are not supposed to be involved in the ability measured, may obstruct or contribute to the information required by this tool. One of these factors is test-wiseness.

Test-wiseness, also called test-taking skills/strategies, test sophistication, test familiarization, test-taking orientation, or test-wisdom (Anastassi, 1976; Erickson, 1972; Sarnacki, 1979), is a complex phenomenon that is reflected in test performance and accounts for some systematic variance in test scores. In attempting to demonstrate the construct validity of test-wiseness, the literature reviewed in this section is organized in the following two subsections: (1) related studies and (2) related literature.

### 2.1 Related Studies

Success in the classroom is often measured in terms of course grades earned by students. Knowledge of content area is the major prerequisite to obtaining good test results. Students should be able to read directions and questions, work independently, and, most importantly, write correct responses. Mastery of these skills is vital for doing well on a test. But aside from these skills there is evidence to suggest that there is a positive relationship between test performance and test wiseness (Crehan, Koehler, & Slakter,

1974; Fueyo, 1977; Kubistant, 1981; Lee & Alley, 1981; Moore, Schutz, & Baker, 1966; Slakter, Koehler, & Hampton, 1970; Taylor & White, 1982). There is also some evidence that instruction in test taking is not commonly included in school curricula and instruction (Cuthbertson, 1979).

Because test-taking skills are important and benefit from instruction is evident, it is reasonable that students might profit from learning to use test-wiseness.

### **2.1.1 Test wiseness training**

The practice of test wiseness test training has been widely investigated with the effects resulting in varying degree of success. Giving emphasis on characteristics and format of the test rather than upon content, Wahlstrom, Boersma(1968) concluded that ninth grade students receiving test wiseness training had higher scores on criterion referenced tests.

Callenbach's(1971) investigation reported that test naïve second graders who received test wiseness training scored significantly higher on both an immediate and delayed standardized reading posttest than those students who received no training.

Not all researchers however found test wisenes training to have positive effects. Yearby (1975) found that the test wiseness skills of some third grade students were significantly increased by training but this did not transfer to a significant degree on a standardized reading test. From the foregoing the following conclusions can be drawn.

First, test wiseness is a bona fide entity and deserves attention. Second, it is made up of a set of specific skills rather than a collection of some general or wholistic abilities. It would therefore seem that teachers need to be made aware of test wiseness strategies.

### **2.1.2 Manifestation of test wiseness**

Basically, any test or item that contains any of the characteristics discussed earlier, may allow examinees to substitute test wiseness for knowledge (Ebel, 1972; Langer et al., 1973). As one may suspect, teacher-made tests frequently exhibit test wiseness cues. The reasons for this occurrence should be obvious.

First of all, compared to the professional test-constructor, most teachers are relatively naive of the test wiseness principles. Even if they are familiar with test wiseness, their test-writing skills are not as precise as the professional, so item flaws inevitably occur (Mehrens & Lehmann, 1973).

Secondly, teachers usually do not have the need, desire, or knowledge to determine such factors as test reliability, validity, item difficulty, and discrimination. Once an item is written, rarely is it evaluated for its effectiveness in measuring the criteria.

Finally, most teachers are pressed by time and the situation. As a result their tests may be heavily contaminated with poorly constructed items.

### **2.1.3 Test taking experience**

Kreit (1968) equated TW with test-taking experience, and found that third graders significantly increased their intelligence test scores after previous exposure to three different intelligence tests.

Kreit's research indicated that only a limited amount of practice is necessary to acquire test-taking skills. His subjects made large gains in intelligence scores after only one test administration.

However, such gains may not be expected to be achieved by all individuals, or to occur in other testing situations. Mere experience in testing does not guarantee future success on tests, nor does it qualify an examinee as a skilled test-taker.

### **2.1.4 Type of Items**

Multiple-choice questions are often vulnerable to many of the test wiseness components. This may be logically expected since multiple-choice items contain numerous components (e.g., a stem and four alternatives) where test wiseness cues may occur.

Secondly, since multiple-choice items are usually the most difficult to construct, they may be readily susceptible to all types of shortcomings, including test wiseness.

Empirical evidence for the strong relationship between test wiseness and multiple-choice items was provided in two similar studies. In testing the hypothesis that multiple choice

tests reward the test-wise student, Alker, Carlson, and Hermann (1969) obtained positive results. They found test wiseness was positively and significantly correlated with both multiple-choice test performance and ability to recognize item ambiguity.

Rowley (1974) found high positive correlations between test wiseness and multiple-choice test scores. The subjects' test wiseness was one factor that contributed to success on multiple-choice exams, but had little effect on free response tests.

### **2.1.5 Correlates of Test-wiseness**

In an effort to validate test-wiseness as a construct, Millman et al. (1965) and Sarnacki (1979) suggested that the correlates of test-wiseness should be studied.

Following this suggestion, a large number of empirical investigations have been conducted to study test-wiseness in relation to such variables as intelligence, test anxiety, age, educational level, gender.

**a) Intelligence.** Since test-wiseness is defined as a cognitive ability or a set of abilities (Sarnacki, 1979), it is logically expected that this construct should positively relate to intelligence (Stanley, 1971). However, contrary to such an expectation, only weak to moderate correlations between test-wiseness and intelligence have been found.

Ardiff (1965) conducted the first research in this area. When she administered her test wiseness measure together with an intelligence test to 44 third graders and 48 sixth

graders respectively, she found a correlation ( $r = .51$ ) between the two instruments at the third grade but not at the sixth grade ( $r = -.01$ ).

The variability of the correlations among various test-wiseness strategies and intelligence indicate that test-wiseness is specific to certain cues only, and, therefore, not a general trait.

**b) Test Anxiety.** Logically, it might be expected that there would be a negative correlation between test-wiseness and test anxiety. An examinee must possess some amount of composure and know how to control test anxiety and nervousness in testing situations before she or he is able to identify and profit from test-wiseness cues in the test items. Conversely, a student without this composure may become too anxious to capitalize on test-wiseness. However, the research findings in this area are limited and conflicting. While Millman (1966) reported that there was no relationship between the two variables, Bajtelmit(1977) observed a negative relation. In agreement with Millman, Rogers and Bateson (1991 a), in their recent study of a sample of 936 Grade 12 students, found that test-wiseness reasoning was virtually uncorrelated with test anxiety.

**c) Grade Level and Gender.** Given the complex nature of test-wiseness, it is logical to anticipate that test-wiseness would develop with increasing grade level and with test experience obtained from frequent practice and exposure to tests.

Slakter et al. (1970) first studied test-wiseness in relation to sex and grade level. Using a test containing 16 test-wiseness items embedded within 28 regular items, they examined the

- i) Development of four test-wiseness elements (i.e., stem-options, absurd options, similar
- ii) Options, and specific determiners) in a sample of 2,361 students from grades 5 through 11.

They reported that both the reliabilities and the means of similar option and specific determiners subscales increased at higher grade levels. These increases, according to Slakter et al., suggested that there may be a developmental aspect of test-wiseness. There was a steady increment in the acquisition of test-wiseness ability from grades 5 through 8, after which there was little or no further development. Sarnacki (1979), in agreement with these authors, suggested that "increased testing experience, maturation, and a general desire to achieve may aid high school students in attaining a common, asymptotic level of test-wiseness" (p. 270). His contention was later evidenced by Crehan, Gross, and Slakter (1978) in their second longitudinal study where a sex-by-year multivariate analysis variance revealed that test-wiseness increased with grade level over the period of 8 years and that large individual differences persisted into the high school grades.

In summary, results of studies of test-wiseness suggest that test-wiseness is (a) only weakly to moderately correlated with intelligence, (b) possibly negatively related to test anxiety, (c) positively correlated with grade level but not with sex.



## **2.2 Related Literature**

### **2.2.1 Definitions of Test-Wiseness**

Thorndike (1951) is credited as being the first to recognize test-wiseness as a persistent factor that can influence test performance (p. 568). His description of test wiseness follows:

Shrewdness with regard to when to guess, and a keen eye for secondary and extraneous cues that are likely to be useful in a wide range of tests, particularly those that are not well constructed (p.569).

Despite Thorndike's suggestion that the validity of the interpretation of a test score may be compromised by the influence of test-wiseness, it was not until 1964 that the first empirical study of test-wiseness was conducted. Based on Thorndike's brief description of test-wiseness, Gibb (1964) developed and validated a scale to measure test wiseness.

In his study, Gibb referred to test-wiseness as "the ability to react profitably to the presence of secondary cues in a test" (p. 5).

Like Thorndike, Gibb felt that, given individual differences in test-wiseness, it was a source of systematic error variance that could jeopardize the valid interpretation of a test score.

In the next year, Millman, Bishop, and Ebel(1965) published what has become the most frequently quoted definition of test-wiseness: "a subject's capacity to utilize characteristics and formats of the test and/or test taking situation to receive a high score.

Immediately following Millman et al.'s (1965) seminal work, several studies on the influence of test-wiseness were conducted, with only minor changes in the definition of test-wiseness. For example, Diamond and Evans (1972) referred to test-wiseness as "the ability to respond advantageously to multiple choice items containing extraneous clues and to obtain credit on these items without knowledge of the subject matter" (p. 135).

### **2.2.2 The Taxonomy of Test- Wiseness Principles**

Test wiseness encompasses both the method of measurement (test testing situation), and characteristics of examinees (states-traits) and is categorized into two:-

In the first half are principles of test wiseness which are independent of the test- constructor or test purpose. The elements presented here are applicable in most testing situations, regardless of previous exposure (or a lack of it) to either the test-maker, or other tests with a similar purpose.

The second category contains elements dependent upon the test- constructor or test purpose. Here the test-taker may profit from knowledge of a particular test-maker's idiosyncracies, or from past experiences on tests with similar purposes. Strategies under this half of the outline are based upon the assumption that examinees will defer to the style of the test- constructor, in order to maximize their scores. Millman et al. (1965) noted however, that the examinee should revert to use of these cues, only when direct knowledge and reasoning do not lead to an answer.

The researcher however concentrated on investigating the principles of test wiseness which are in the first category.

**a) Time using strategies**

Time-using strategies are meant to be implemented on those tests which restrict the time allotted the test-taker. The points listed here are guidelines to optimal management of time, intended to prevent a loss of points for a reason other than lack of knowledge of test content (Huff, 1961).

**b) Error avoidance strategies**

These strategies present rules of thumb to avoid minor mistakes, so that the examinee is not penalized for his or her carelessness. (Heston, 1953; Hook, 1958; Huff).

**c) Guessing strategies**

Guessing strategies allow the test taker to gain points beyond those attained on the basis of knowledge of the subject matter. Millman, et al. (1965) noted that if examinees wish to maximize their test scores, use of an appropriate guessing strategy is a viable means of doing so. The first suggestion of guessing if right answers only are scored is obvious.

In this situation, the examinee is not only not penalized for an incorrect guess, but for example, in a four alternative multiple-choice item, a random guess is expected to earn one quarter point (Millman et al., 1965).

The next principle under guessing strategies is concerned with guessing on tests scored with a "correction for guessing" formula. If an item guessed at incorrectly has a greater expected value (the value after the correction for guessing is applied) than one omitted completely, then the examinee should guess.

Cronbach (1946) stated that on objective tests the examinee has a better than chance probability of guessing the correct answer, so one should guess even when a correction for chance is utilized. Experimentation by Slakter (1968a, 1968b) revealed that test-takers who employed conservative guessing strategies received lowered test scores on objective tests, regardless of the type of instructions (scoring formulas) used.

The final element of the guessing strategy suggests guessing whenever the test taker may eliminate one or more of the options as incorrect. Successful elimination of options increases the probability that the option selected will be the correct one.

Even with a correction for guessing, the expected value of an item guessed at after various options have been eliminated, is greater than zero (Millman et al., 1965).

Therefore it behooves the test-taker to guess whenever in possession of partial information on an item. This premise is reinforced in a study by Ebel (1968), indicating that pure blind-guessing on objective tests is rare. He contended that examinees have at least partial insight into the correct answer, and therefore should always guess, even when a correction formula is employed.

#### **d) Deductive reasoning strategies**

Deductive reasoning allows examinees to acquire points beyond those achieved through direct knowledge of the subject matter. Millman et al (1965) noted additionally, that successful deductive reasoning is dependent on some knowledge of the tested material. However, the correct answer is not known without the presence of other choices, or questions, to serve as cues in the reasoning process.

The first reasoning principle suggests elimination of alternatives which are known to be incorrect. This strategy is also known as "absurd options" (Gibb, 1964), since one or more of the alternatives may be eliminated because of their logical inconsistencies with the stem. For example, in the item:

The capital city of Uganda is:

- a) Jinja
- \*b) Kampala
- c) South Sudan
- d) Kivu

Option c) is not consistent with the stem since it is a country just like Uganda, and therefore may be eliminated as a possible answer.

The next deductive reasoning strategy calls for elimination of two options that express the same fact, since they imply each other's incorrectness (Huff, 1961). If only one of

four alternatives is the keyed answer, and two of the options are the "same," then both may be eliminated since they cannot both be correct. This principle has also been referred to as "similar options" (Slakter et al., 1970a), and "similar meaning" (Langer, Wark, & Johnson, 1973). For example:-

The square root of 16 is:

- a) 2                    \* c) 4
- b) 8/4                d) 8

Options a) and b) both reduce to the number 2, and therefore may be eliminated as possible answers, since both cannot be correct.

In their research on the relationship between test wiseness and grade level, Slakter et al.,(1970a) found that absurd options behaviors were evidenced in fifth grade subjects, but similar options attainment did not frequently occur until eighth grade.

The third reasoning element deals with options that are opposite in meaning. In listing various test wiseness cues, Langer et al., (1973) implied that when two options are opposite in meaning, one of them will be correct.

In general then, in an item with two options opposite in meaning, the examinee: a) can safely eliminate at least one of the options, and b) cannot select both options, since the correctness of one implies the incorrectness of the other.

The fourth reasoning principle encourages an examinee to select an option which encompasses all other options known to be correct. In general, such an option may be classified as an "umbrella term" since it encompasses two or more correct response components e.g., "all of the above".

The final reasoning category points to the use of content information in other items, to use as cues in selecting an answer in a present item. Gibb (1964) introduced this strategy under the name item "give-away," because the answer to the item was given to the examinee in another test question.

### **2.2.3 Theoretical Approaches to Test wiseness**

The fact that test wiseness may be assessed from either the test or the test-taker illustrates two theoretical perspectives adopted by test specialists.

The first approach considers test wiseness as an additional source of variance in test scores. Here test wiseness is evaluated for its effects on test score, reliability, and validity. The second labels test wiseness as a lasting and persistent trait of the examinee. Concern here is not with psychometric characteristics of tests, but with an individual's ability to employ test wiseness skills. These two viewpoints are not mutually exclusive, but instead are strongly interdependent.

### **2.2.3.1 Test wiseness as due to faulty test construction**

The first theory asserts that test wiseness exists due to faulty test construction. Test wiseness is viewed as being quite specific to the cues in poorly written items (Diamond & Evans, 1972). Flawed test items allow introduction of a source of variance other than item content or random error (Ebel, 1972). In responding to test wiseness cues representing this additional source of variance, the testee may increase his or her test score, but may also depress test reliability and validity. Thorndike (1951) and Stanley (1971) concluded that test wiseness presents more of a problem to validity than reliability, since it consistently represents systematic invalid variance. Although the variance is systematic, it is unrelated to the criterion. The intrusion of this irrelevant variance indicates that the test's validity may be attenuated, since examinees' responses may be a function of their test wiseness, not their knowledge of content. In addition, differences in various forms of tests, arising through sources such as the idiosyncrasies of different test-makers, tend to lower correlations between alternate test forms.

Since test wiseness cues may depress both reliability and validity, as well as artificially inflate test scores, proponents of this first interpretation of test wiseness stress the elimination of these item cues as a necessary step in the process of accurate and valid measurement.

### **2.2.3.2 Test wiseness as due to the general mental ability of the test taker**

The second theoretical approach to test wiseness holds that it is a persistent attribute of the individual test-taker. Examinees differ in test-taking abilities due to possession of



different amounts of certain general and persistent traits such as test wiseness (Thorndike, 1951). Jacobs (1975) offered the suggestion that test wiseness may be a highly specific trait of general mental ability. Thorndike (1951) similarly reasoned that since test wiseness represented systematic variance, it is therefore a general, lasting quality of the individual.

Empirical evidence for Thorndike's thesis was provided by Crehan et al. (1974), who found test wiseness to be a stable characteristic over grade levels 5 through 11; and by Gibb (1964), who found reliable individual differences in test wiseness abilities.

In general, these theorists maintain that test wiseness is best explained in terms of the abilities, states, or traits of the individual examinee, and not by characteristics of tests. Proponents of this interpretation argue that the problematic effects of test wiseness are best ameliorated through test wiseness training (Crehan et al., 1974).

### **2.2.3.3 Testwiseness as a factor of the nature of the test, the test situation and the examiner**

A third theoretical approach suggests the synthesis of the first two. Although both viewpoints offer necessary information concerning test wiseness, neither theory alone is sufficient in explaining the construct. Therefore this theory concludes that test wiseness encompasses both the method of measurement, and the characteristics of the test-taker. It follows then, that any thorough research of test wiseness should include elements from both viewpoints. This is necessary not only to delimit all possible sources of variance in

the construct, but also to allow evaluation as to which of these sources accounts for the most variance in test wiseness performance.

Such evaluations address the present theoretical question as to whether test wiseness is a global trait of a general nature, or specific to certain tests or item cues. Pertinent research could be carried out through the multitrait-multimethod procedure (Campbell & Fiske, 1959), comparing the relative contribution of trait variance to method variance in test wiseness performance.

The necessity of including all possible components in the study of test wiseness was similarly expressed by Woodley (1973). She describes test wiseness as "factorially complex and motivated by certain personality characteristics as well as by the nature of the test, the test situation and the examiner."

Approaching test wiseness from this broader theoretical perspective, prevents the researcher from ignoring any relevant information that may be necessary in investigating test wiseness. If there are any limitations to this approach, it may be that even a larger, more sophisticated model of test wiseness is necessary, including perhaps affective components such as test anxiety (Jacobs, 1975).

### **2.3 Conceptual Framework**

Deductive reasoning allows examinees to acquire points beyond those achieved through direct knowledge of the subject matter. Millman et al. (1965) noted additionally, that

successful deductive reasoning is dependent on some knowledge of the tested material. However, the correct answer is not known without the presence of other choices, or questions, to serve as cues in the reasoning process.

The first reasoning principle suggests elimination of alternatives which are known to be incorrect. This strategy is also known as "absurd options" (Gibb, 1964), since one or more of the alternatives may be eliminated because of their logical inconsistencies with the stem.

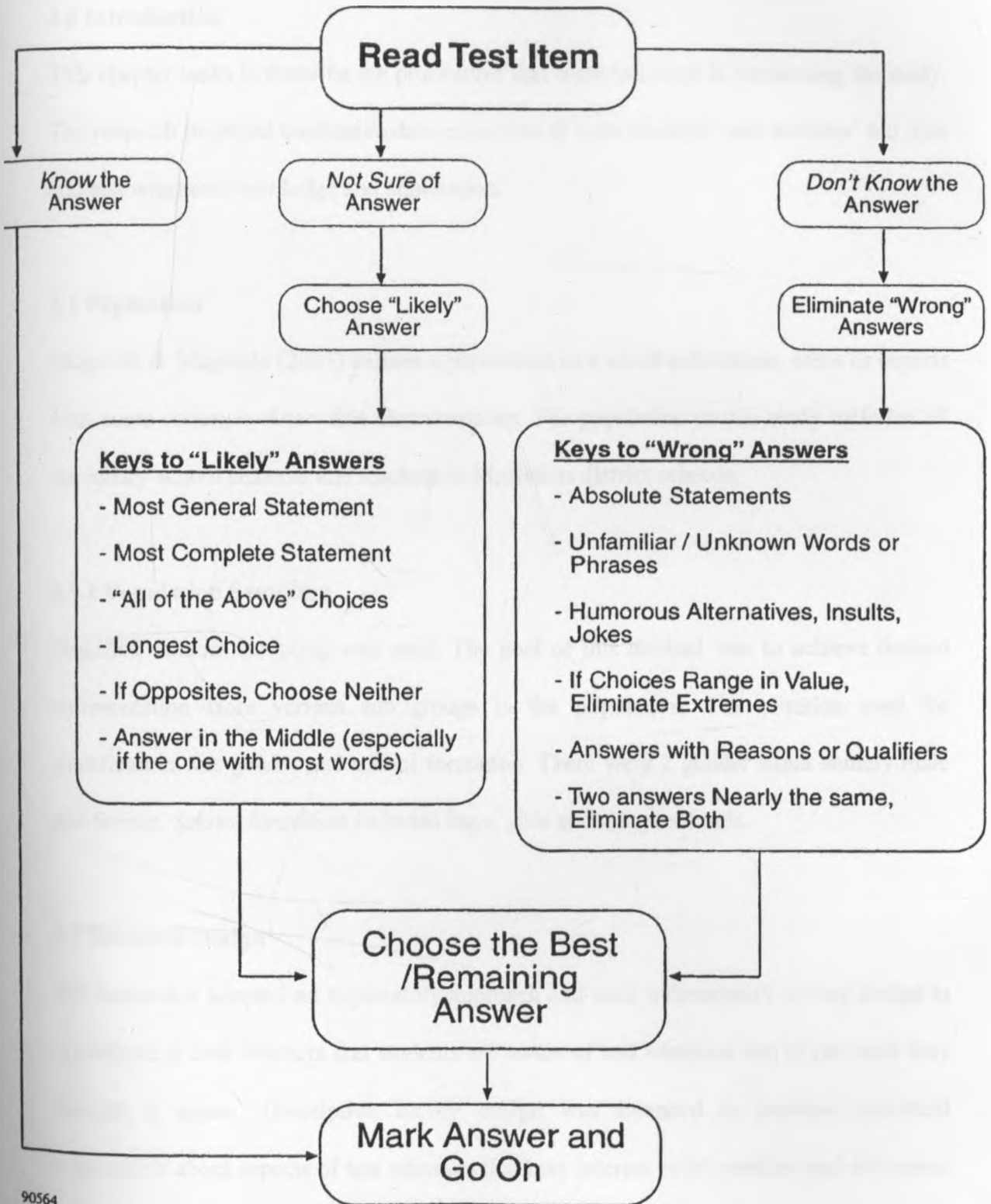
The next deductive reasoning strategy calls for elimination of two options that express the same fact, since they imply each other's incorrectness (Huff, 1961). If only one of four alternatives is the keyed answer, and two of the options are the "same," then both may be eliminated since they cannot both be correct. This principle has also been referred to as "similar options"

The third reasoning element deals with options that are opposite in meaning. In listing various TW cues, Langer et al., (1973) implied that when two options are opposite in meaning, one of them will be correct.

The last deductive reasoning principle encourages the examinee to select an option which encompasses all other options known to be correct. In general, such an option may be classified as an "umbrella term" since it encompasses two or more correct response components.

**Figure 2.1: Conceptual Framework**

*Selecting Answers to Multiple Choice Questions*



## **CHAPTER THREE: METHODOLOGY**

### **3.0 Introduction**

This chapter seeks to describe the procedures that were followed in conducting the study. The research involved qualitative data collection of both students' and teachers' bio data and test wiseness knowledge and application.

### **3.1 Population**

Mugenda & Mugenda (2003) defines a population as a set of individuals, cases or objects with some common observable characteristics. The population in this study included all secondary school students and teachers in Machakos district schools.

#### **3.1.1 Population Sampling**

Stratified random sampling was used. The goal of this method was to achieve desired representation from various sub groups in the population. The criterion used for stratification was gender and school formation. There were 2 gender strata namely male and female. School formation included boys, girls and mixed schools.

### **3.2 Research Design**

The researcher adopted an exploratory approach and used a descriptive survey design to investigate if both teachers and students are aware of test wiseness and if yes what they thought it meant. Descriptive survey design was intended to produce statistical information about aspects of test wiseness that may interest policy makers and educators.

A total of 30 teachers, 5 in each of the 6 schools sampled were selected to participate in the research.

In addition, 30 students (15 boys and 15 girls) in each of the 2 sampled mixed schools were selected randomly to participate in the study. 30 students in each other 4 schools (boys or girls) were selected randomly to participate in the study.

### **3.3 Research Instruments**

The instrument for this study was a self reported confidential survey that measured knowledge of test wiseness skills and demographics. Respondents responded to a 18 test wiseness items on a 5 point likert scale (1=strongly disagree,2=disagree,3=neutral,4=agree,5=strongly agree) and responded to demographic questions.

High score indicated a high test wiseness efficacy by the respondents. Statements were phrased both positively and negatively to increase reliability and reduce apathetic answers. Content validity of the items was established upon critical reading by peers. Piloting was done to ascertain reliability. Piloting helped identify unclear directions, insufficient space to write responses, wrong phrasing of questions and vague questions. Their feedback led to improvement on wanting items to valid levels for the study. The reliability coefficient of the instrument and its validation were established through conducting a pilot study involving 20 subjects selected from 2 schools in the area of study.

### **3.4 Data Collection**

Before the study commenced, permission was sought from Machakos District Education authorities. The Head teachers of the sampled schools as well as the class teachers were involved. This ensured harmony between test schedules and survey study process. Before filling the questionnaire, the researcher verbally informed the students and teachers about the study. Due to the need for a survey identifier needed later in the study to match the student with his or her school, signed consent forms were collected from randomly sampled students in the classrooms.

### **3.5 Ethical Considerations**

To ensure confidentiality and reduce research bias, all questionnaires were coded, then a separate list was created linking students survey numbers (codes) to their schools. This list was kept separate from the survey data. No identifying information was given to the students on the actual survey.

### **3.6 Data Analysis**

After the data had been collected, they were keyed in into the computer. They were scored, tabulated and coded. Analysis was done using SPSS. Descriptive statistics included computing means, frequencies and standard deviation. Graphs were used to present the results.

## **CHAPTER FOUR: DATA ANALYSIS AND INTERPRETATION**

### **4.0 Introduction**

Data analysis aims at bringing order, structure and meaning to the mass of information collected. The purpose of this research was to investigate test wiseness with a view to determining the nature of the construct and the extent to which it is practiced by both students and teachers.

Having identified the problem of study in chapter one, reviewed existing literature and shown gaps of knowledge in chapter two, chapter three explained the methods that the study used to collect data. This chapter highlights the findings of the study based on the data collected from respondents. The chapter is organized under sub-sections guided by the research questions. The study employed various statistical tools for extracting the application of test-wiseness by secondary school students and teachers in Machakos District. The data was gathered mainly using a questionnaire as the research instrument. The questionnaire was designed in line with the objectives of the study.

### **4.1 Questionnaire Return Rate and Demographic information**

#### **4.1.1 Questionnaire Return Rate**

The study sampled a total of 210 respondents from the target population in collecting data with regard to the effect of test-wiseness on academic performance of secondary school students in Machakos District. This included 30 teachers and 180 students from the 6



schools sampled in the study. The questionnaire return rate results are shown in Table 4.1.

**Table 4.1: Response Rate**

Response	Teachers		Students		Total	
	Frequency	%	Frequency	%	Frequency	%
Responded	30	100	178	99	208	99
Not responded	0	0	2	1	2	1
Total	30	100	180	100	210	100

**Source: Author, 2012**

From the study, 30 out of 30 targeted teachers from the 6 schools filled in and returned the questionnaire. In addition, a total of 178 students respondents out of the 180 targeted students participated by filling in the questionnaire. As such, from the 210 questionnaires distributed to the various respondents consisting of teachers and students, a total of 208 responses were received from the study contributing to 99% response rate. This commendable response rate was made a reality after the researcher made personal visits to remind the respondent to fill-in and return the questionnaires as well as explaining the importance of their participation in this study.

This commendable response rate can be attributed to the data collection procedure, where the researcher personally administered questionnaires and waited for respondents to fill in, kept reminding the respondents to fill in the questionnaires through frequent phone

calls and picked the questionnaires once fully filled. This response rate was good and representative and conforms to Mugenda and Mugenda (1999) stipulation that a response rate of 50% is adequate for analysis and reporting; a rate of 60% is good and a response rate of 70% and over is excellent. The questionnaires that were not returned were due to reasons like, the respondents were not available to fill them in at that time and with persistence follow-ups there were no positive responses from them. The response rate demonstrates a willingness of the respondents to participate in the study.

#### **4.1.2 Demographic information**

The study targeted the teaching staffs and students in collecting data with regard to effect of test-wiseness on academic performance of secondary school students in Machakos District. As such the results on gender, type of school, academic level, experience, subject area and school's mean score last year (2011) of the respondents involved were investigated in the first sections of the questionnaires and are presented in this section.

The research sought to find out the gender of the respondents. In this study the respondents sampled were expected to comprise both male and female staffs and students. As such, the study required the respondents to indicate their gender by ticking on the spaces provided in the questionnaire.

UNIVERSITY OF NAIROBI  
LIBRARY

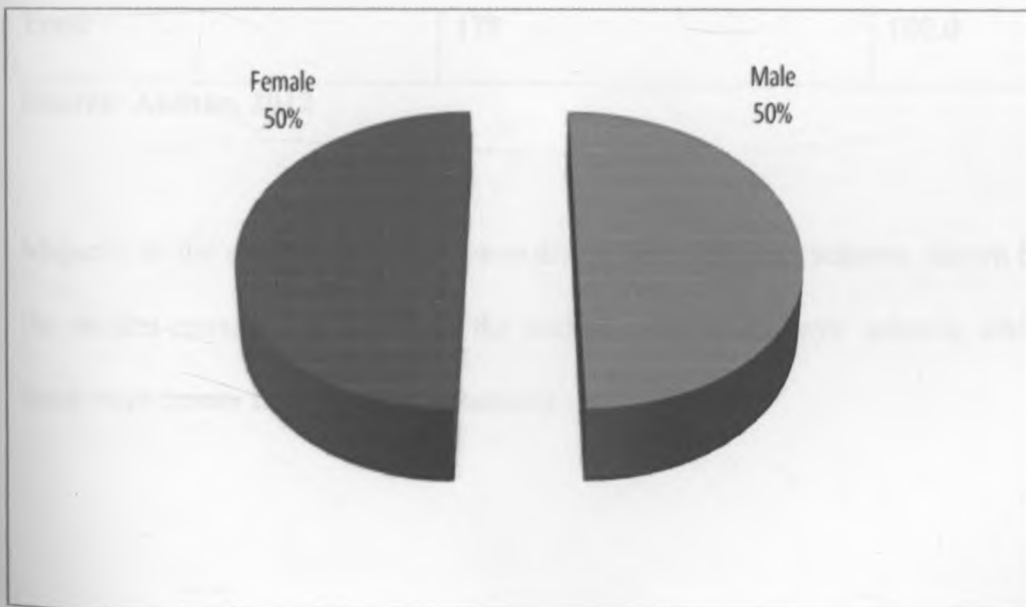
**Table 4.2: Gender of the Students**

Gender	Frequency	Percent
Male	87	48.9
Female	91	51.1
Total	178	100.0

**Source: Author, 2012**

Accordingly, 51.1% of the respondents were male while 48.9% of them were female students. The findings show that the institutions studied had both male and female students. However, it can be noted that the majority of the students in the institutions investigated were male students.

**Figure 4.1: Gender of Teachers**



**Source: Author, 2012**

On the other hand an equal number of male and female staffs participated in the study comprising of 50% in each case. This is a clear indication that the teaching staffs found in the schools involved are both male and female staffs.

The study involved the respondents from the mixed schools as well as exclusively boys and girls schools. The distributions of the respondents among these schools are analyzed in this section.

**Table 4.3: Distribution of Students by Nature of School**

<b>Nature of Schools</b>	<b>Frequency</b>	<b>Percent</b>
Boys	60	33.7
Girls	62	34.8
Mixed	56	31.5
Total	178	100.0

**Source: Author, 2012**

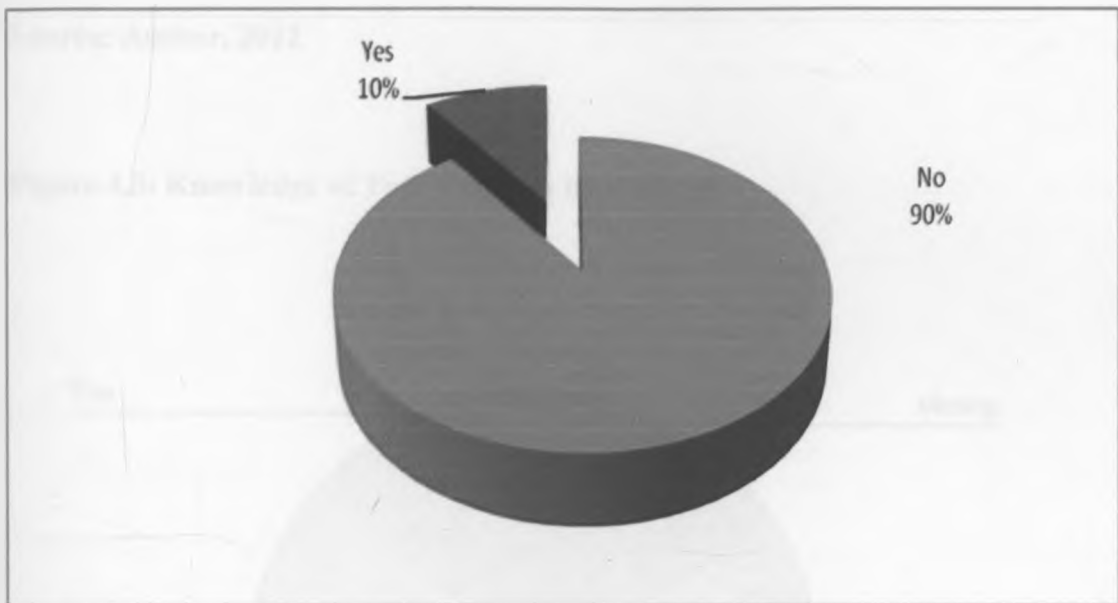
Majority of the students involved were drawn from the girls schools, shown by 34.8% of the student respondents, 33.7% of the students were from boys' schools, while 31.5% of them were drawn from the mixed schools.

## 4.2 Data Analysis

### 4.2.1 Objective 1

The study aimed at first, investigating whether the respondents had heard of test wiseness and if they had, what they thought it meant.

**Figure 4.2: Knowledge of Test Wiseness by teachers**



**Source: Author, 2012**

From the study, an overwhelming 90% of the teacher respondents indicated that they had never heard of test wiseness, as compared to 10% of those who indicated that they had heard of test wiseness.

**Table 4.4: Students Response on whether they had heard of Test Wiseness**

Response	Frequency	Percent
No	126	70.8
Yes	24	13.5
No response	28	15.7
Total	178	100.0

**Source: Author, 2012**

**Figure 4.3: Knowledge of Test Wiseness by students**



**Source: Author, 2012**

On the other hand, majority (70.8%) of the students indicated that they had never heard of test wiseness, 13.5% of them they had heard of test wiseness, while 15.7% of the students indicated no response on knowledge of test wiseness.

Upon indicating that they had heard about test wiseness, the study required the respondents to indicate what they understood by test wiseness. The student respondents reiterated that it is the ability to answer questions correctly; others indicated that test wiseness tests how wise they are, others indicated that it is the wisdom in anybody, testing one's wisdom as well as being wise in answering questions. On the same question, the teachers indicated that they viewed test wiseness as the ability to do tests well and test tricks.

#### **4.3.2 Objective 2**

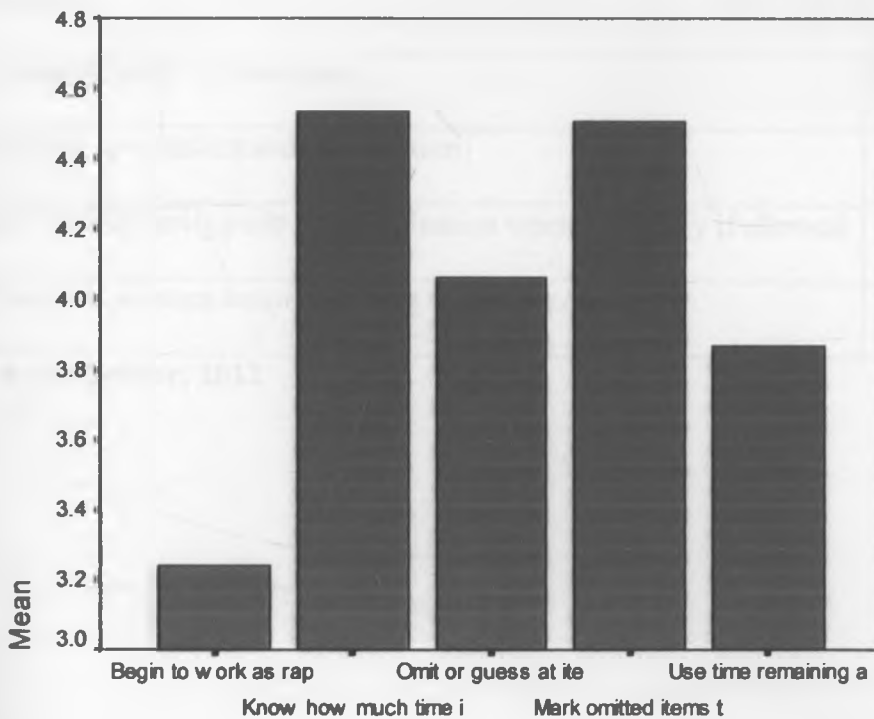
The study sought to establish the students' agreements on the various statements relating to the test wiseness. The students were required to indicate their agreement on various statements regarding the four main test wiseness skills independent of the test maker or test purpose and applicable in most testing situations. The first two subcategories consist of test wiseness strategies which, if applied, may help examinees avoid losing marks for reasons other than lack of the content knowledge being measured. The last two subcategories are composed of test wiseness elements or strategies which allow examinees to gain extra credits beyond what they would otherwise have received on the basis of sure and full knowledge of the specific content area being tested.

**Table 4.5: Students' Agreement with Statements on time using strategies**

Statements	Mean	Std. Deviation
Begin to work as rapidly as possible with assurance of accuracy	3.29	1.410
Know how much time is allowed as this governs his/her strategy	4.54	.693
Omit or guess at items which resist a quick response	4.06	1.066
Mark omitted items to be considered after going through the test	4.51	.778

Source: Author, 2012

**Figure 4.4: students' agreement with statement on time using strategies**



Source: Author, 2012



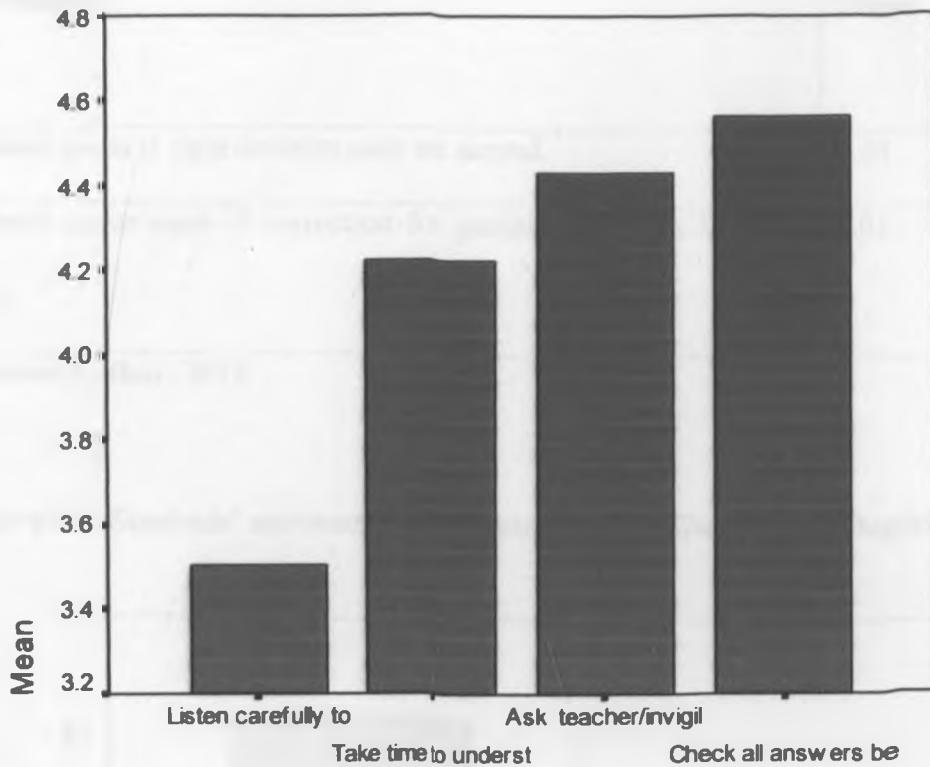
Majority of the students agreed with/applied test wiseness strategies on time using. This is evidenced by the high means of 4.54 and 4.51. Marking omitted items to be considered after going through the test seems to be one strategy applied by majority of the students. However majority of the students were undecided on if they should begin working as rapidly as possible with assurance of accuracy as demonstrated by its mean of 3.29.

**Table 4.6: Students' agreement with Statements on Error avoidance Strategies**

<b>Statements</b>	<b>Mean</b>	<b>Std Deviation</b>
Use time remaining after completion of the test to reconsider answers	3.87	1.192
Listen carefully to directions	3.51	1.286
Take time to understand the question	4.23	1.222
Ask teacher/invigilator for clarification when necessary if allowed	4.44	.877
Check all answers before handing over the exam paper.	4.56	.760

**Source: Author, 2012**

**Figure 4.5: Students' agreement with Statements on Error avoidance Strategies**



**Source: Author, 2012**

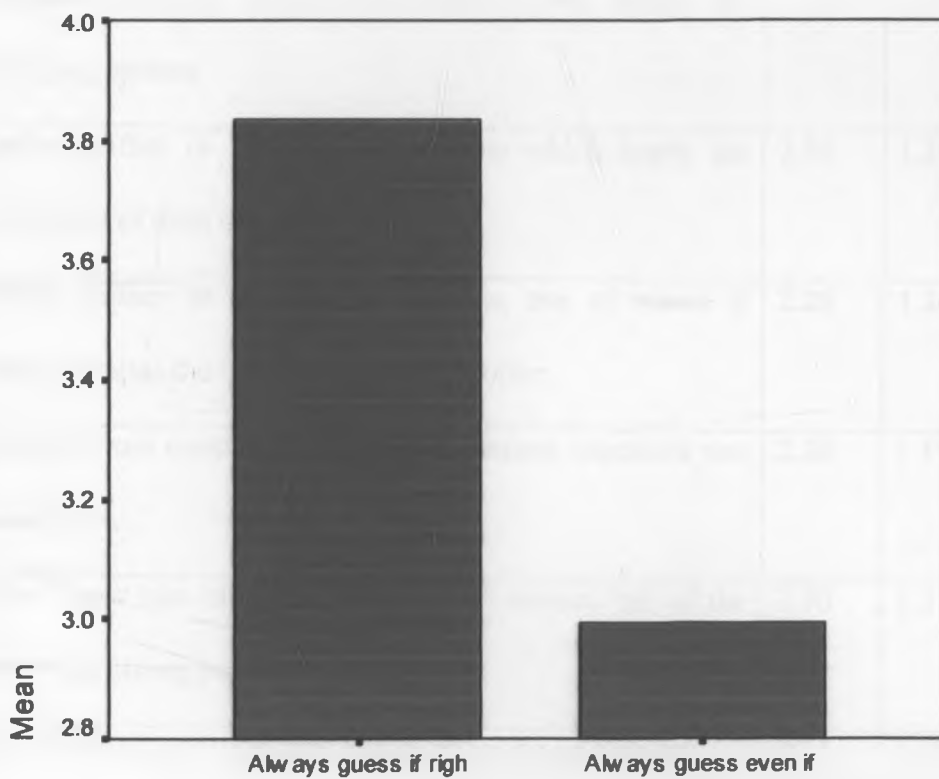
Majority of the students were in agreement with the statements that an examinee should check all answers before handing over the exam paper and should ask the teacher/invigilator for clarification when necessary if allowed as evidenced by the high means of 4.56 and 4.44 respectively. This sub category of test wiseness skills on error avoidance aimed at eliciting knowledge on the application of test taking skills that reduce simple mistakes that end up costing the student precious marks.

**Table 4.7: Students' agreement with Statements on Guessing strategies**

Statements	Mean	Std. Deviation
Always guess if right answers only are scored.	3.84	1.215
Always guess even if correction for guessing formula is to be used	3.01	1.328

Source: Author, 2012

**Figure 4.6: Students' agreement with Statements on Guessing strategies**



Source: Author, 2012

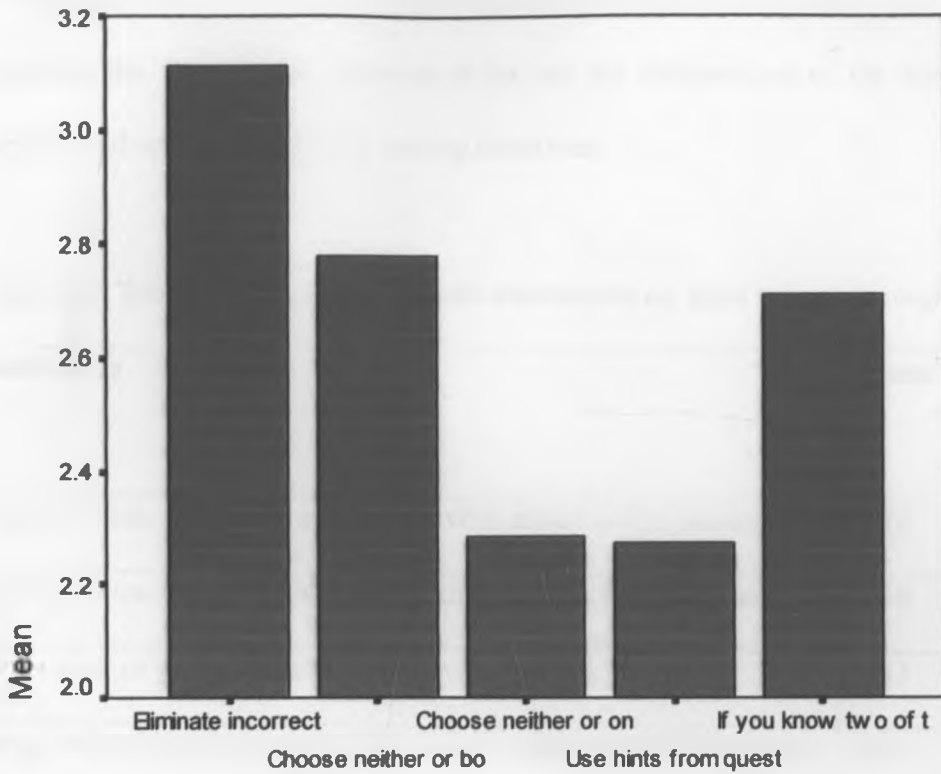
There were two statements which sought to know if examinees would guess if correction for guessing formula was used and when it was not used. Majority agreed on the need to guess when the correction for guessing formula was not used. Many of the respondents were neutral (undecided) about guessing when the correction for guessing formula was used. This might be because they did not know what the correction for guessing formula was since this is a term only met often by test specialists.

**Table 4.8: Students' Agreement with statements on Deductive reasoning strategies**

Statements	Mean	Std. Deviation
Eliminate incorrect options and choose from among the remaining options	3.12	1.344
Choose neither or both of two options which imply the correctness of each other	2.80	1.290
Choose neither or one of two options, one of which if correct, implies the incorrectness of the other.	2.28	1.247
Use hints from questions you know to answer questions you do not know.	2.28	1.198
If you know two of three options seem correct "all of the above" is a strong possibility.	2.70	1.311
Read all the alternatives first before choosing an answer	2.77	1.285
If alternatives range in value, choose from the extremes and not the means	3.45	1.348

**Source: Author, 2012**

**Figure 4.7: Students' Agreement with statements on Deductive reasoning strategies**



**Source: Author, 2012**

Many of the students did not apply deductive reasoning strategies which allow examinees to gain extra credits beyond what they would otherwise receive on the basis of sure and full knowledge of the specific content area being tested. This is demonstrated by the low means of 2.70, 2.28 etc. Majority did not use hints they knew to answer the questions did not know and did not know that they should choose neither or one of two options, one of which, if correct implies the incorrectness of the other.

### 4.3.3 Objective 3

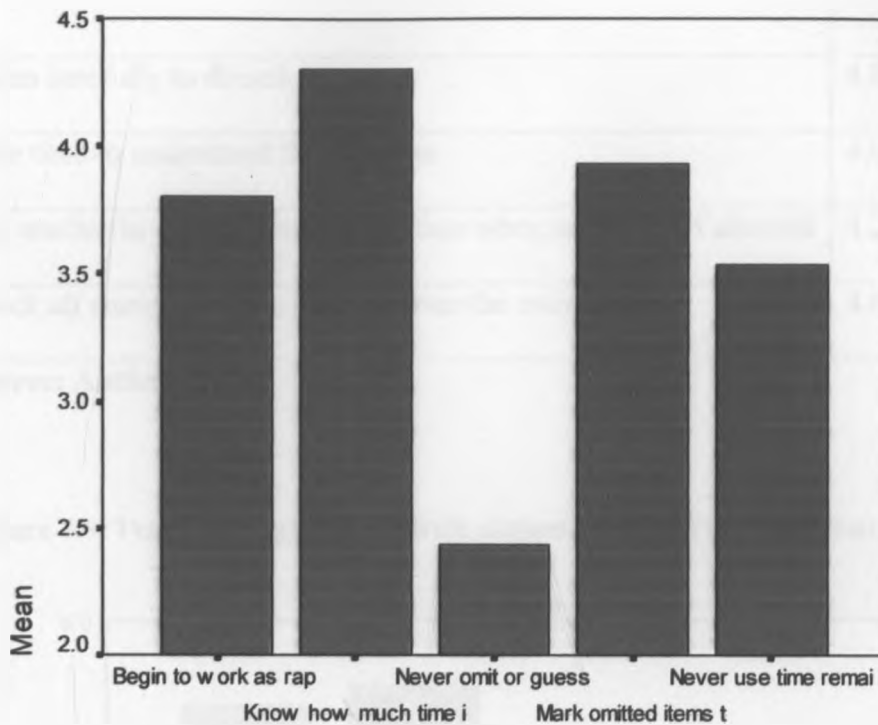
On the same note, the teachers were required to indicate their agreement with statements regarding the various test wiseness skills that are independent of the test maker or test purpose and applicable in most testing situations.

**Table 4.9: Teachers' Agreement with statements on time using strategies**

<b>Statements</b>	<b>Mean</b>	<b>Std. Deviation</b>
Begin to work as rapidly as possible with assurance of accuracy	3.80	1.186
Know how much time is allowed as this governs his/her strategy	4.30	.915
Never omit or guess at items which resist a quick response	2.43	1.305
Mark omitted items to be considered after going through the test	3.93	1.081
Never use time remaining after completion of the test to reconsider answers	3.53	1.479

**Source: Author, 2012**

**Figure 4.8 Teachers' Agreement with statements on time using strategies**



**Source: Author, 2012**

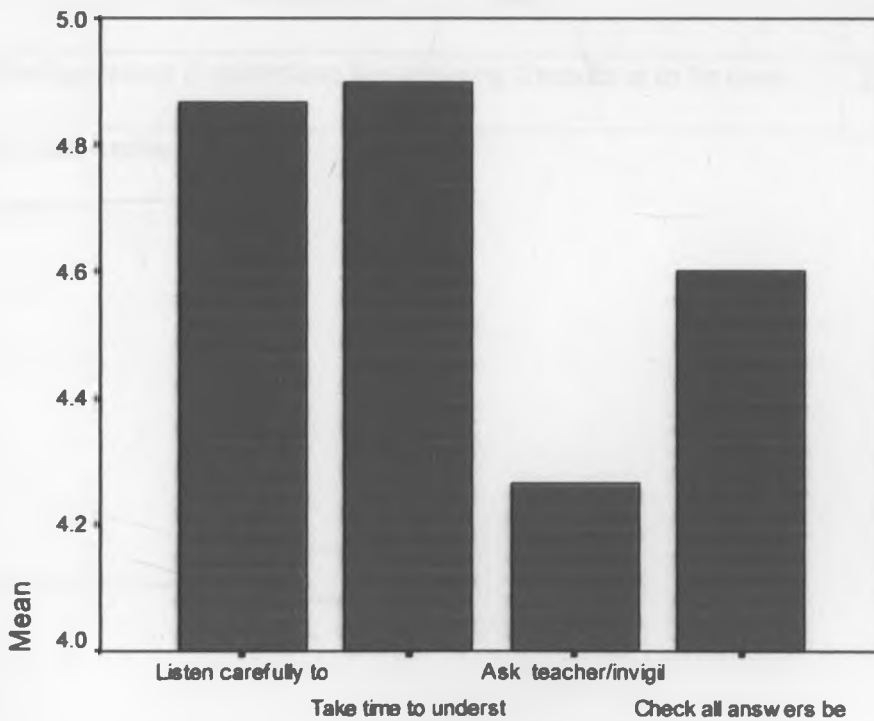
Majority of the teachers applied time using strategies in test taking as evidenced by the high means of 4.30 and 3.93 among others. Majority of the respondents strongly disagreed to never omitting or guessing at items which resisted a quick response as evidenced by the low mean of 2.43. This statement had been reversed hence it meant majority agreed to omitting or guessing at items which resist a quick response.

**Table 4.10: Teachers' agreement with statements on error avoidance strategies**

Statements	Mean	Std. Deviation
Listen carefully to directions	4.87	.346
Take time to understand the question	4.90	.305
Ask teacher/invigilator for clarification when necessary if allowed	4.27	.944
Check all answers before handing over the exam paper.	4.60	.563

Source: Author, 2012

**Figure 4.9: Teachers' agreement with statements on error avoidance strategies**



Source: Author, 2012



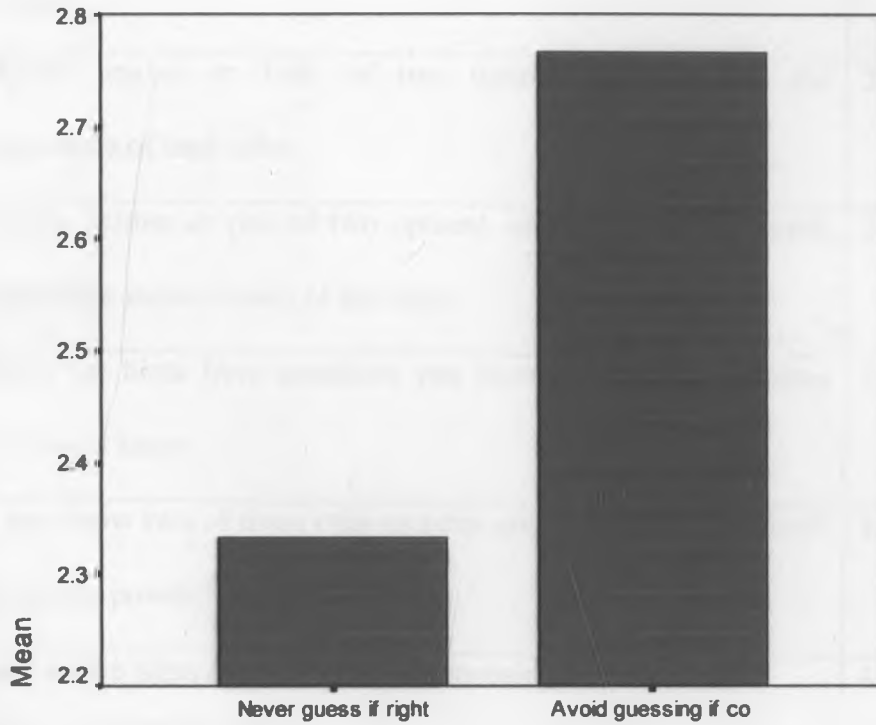
Most of the teachers applied test wiseness strategies on error avoidance exceptionally as evidenced by the very high means of 4.90 and 4.87. Therefore it can be concluded that the teachers taught or encouraged the students to listen carefully to directions and take time to understand the questions. It was also observed that many as shown by the high mean of 4.60, that teachers strongly advise the students to check all answers before handing over the exam paper.

**Table 4.11: Teachers' agreement with Statements on Guessing strategies**

<b>Statements</b>	<b>Mean</b>	<b>Std. Deviation</b>
Never guess if right answers only are scored.	2.33	1.398
Avoid guessing if correction for guessing formula is to be used	2.77	1.331

**Source: Author, 2012**

**Figure 4.10: Teachers' agreement with Statements on Guessing strategies**



**Source: Author, 2012**

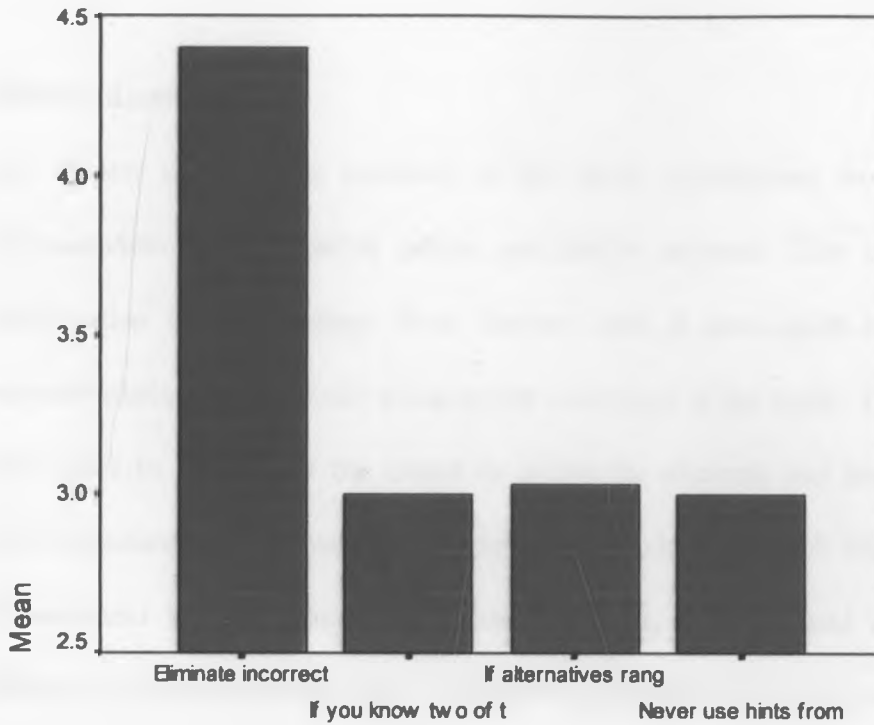
The statements had been reversed to reduce apathetic responses and the low means of 2.33 and 2.77 proved that teachers applied the test wiseness strategies on guessing techniques. The teachers advised the students to hazard a guess whether the correction for guessing formula was used or not.

**Table 4.12: Teachers' Agreement with statements on Deductive reasoning strategies**

Eliminate incorrect options and choose from among the remaining options	4.40	1.037
Choose neither or both of two options which imply the correctness of each other	2.63	1.245
Choose neither or one of two options, one of which if correct, implies the incorrectness of the other.	2.37	1.217
Never use hints from questions you know to answer questions you do not know.	3.00	1.287
If you know two of three options seem correct "all of the above" is a strong possibility.	3.00	1.259
Read all the alternatives first before choosing an answer	4.60	.932
If alternatives range in value, choose from the extremes and not the means	3.03	1.402
If you have to guess and spot a typing error in one of the answers, choose one of the other answers	3.23	1.455

**Source: Author, 2012**

**Figure 4.11: Teachers' Agreement with statements on Deductive reasoning strategies**



**Source: Author, 2012**

The teachers scored moderately on test wiseness skills that touched on deductive reasoning as evidenced by the means of 2.63, 3.0 etc. Almost an equal number of the respondents agreed and disagreed on the strategy of using hints to answer other questions in the test as shown by the mean of 3.00. Generally the teachers just like the students were not conversant with deductive reasoning strategies and hence did not apply them very much. However, the teachers strongly agreed that students should eliminate incorrect options and choose from among the remaining options and read all the alternatives first before choosing an answer.

## **CHAPTER FIVE: INTERPRETATION, CONCLUSIONS AND RECOMMENDATIONS**

### **5.0 Introduction**

This chapter contains the summary of the study, conclusions from the findings and recommendations for possible action and further research. This chapter provides the interpretation of the findings from chapter four; it also gives the conclusions and recommendations of the study based on the objectives of the study. The objectives of this study were to investigate the extent to which the students and teachers in Machakos district practice test wiseness and to establish the extent to which they apply elements of test wiseness that is, time using, error avoidance, guessing and deductive reasoning strategies. Arising from the study, the following conclusions can be made.

### **5.1 The extent to which students apply elements of test wiseness**

It was found that majority of the students indicated that they had never heard of test wiseness. However they applied the construct. This can be explained by the fact that the construct of test-wiseness has a relatively short history in educational research.

When asked what they thought it meant, some defined it as ability to answer questions correctly, wisdom in anybody, testing one's wisdom and a test to test how wise someone is. This means they had an idea.

Millman et al. (1965) defined test wiseness as "a subject's capacity to utilize the characteristics and formats of the test and/or the test-taking situation to receive a high score." As a definitional addendum, Millman et al. (1965) noted that "Test-wiseness is logically independent of the examinee's knowledge of the subject matter for which the items are supposedly measures. The research found that the students applied elements of test wiseness that are independent of the test maker or test purpose and applicable in most testing situations.

They were good in applying test wiseness skills in time using, error avoidance and guessing.

However they did not apply deductive reasoning skills well. These were calling for logical thinking, which may be was above the cognitive level of the students. For example, one deductive reasoning strategy calls for elimination of two options that express the same fact, since they imply each other's incorrectness (Huff, 1961). If only one of four alternatives is the keyed answer, and two of the options are the "same," then both may be eliminated since they cannot both be correct. This might prove to be a challenge to those students who do not have knowledge of the content so that they can be able to know which two options have the same meaning.

It is therefore imperative that test wise naïve students be assisted in deductive reasoning strategies.

## **5.2 The extent to which teachers apply elements of test wiseness.**

An overwhelming 90% of the teachers had never heard of test wiseness but surprisingly majority had practiced test wiseness elements.

The teachers were very keen in guiding their students on error avoidance skills more than any other skill. For example, nearly all the teachers emphasized on the students listening carefully to instructions and taking time to understand the questions. This can be inferred to teachers' behavior of not entertaining democracy in class and in their belief they are transmitters of knowledge who should not be challenged.

Majority of the teachers were keen on encouraging students to use time well during a test and omitting questions which resisted a quick response. This can be used to create more time for other questions in time limited tests.

Teachers advised their students to guess at all times if they could not get the right answer straight away. Guessing increases the chance of inflating an examinee's score especially if the correction for guessing formula is not to be used.

The teachers performed better in deductive reasoning strategies than the students. They overwhelmingly advised students to read all the alternatives before choosing an answer. However they were undecided on which alternative to choose if they ranged in value.

Therefore teachers should be explained in detail what test wiseness is though they practise it albeit unknowingly. This arises out of the realization that very little research has been done in Kenya on test wiseness.

### **5.3 Recommendations for further research**

The research concentrated with only one aspect of test wiseness which is test wiseness skills independent of the test maker or test purpose and applicable in most testing situations. Millman et al (1965) defines test wiseness as a subject's capacity to utilize the characteristics and formats of the test and/or the test-taking situation to receive a high score. It is therefore imperative that further research be done on test wiseness elements which are dependent upon the test constructor or the test purpose. These involve consideration of the intent of the question and the recognition of cue-using strategies which may have been inadvertently adopted by the test constructor. These principles may prove beneficial when the test taker has knowledge of particular test making behaviors or knowledge of particular testing practices gained from past experiences with tests similar in purpose and format like the KCSE.

Further research should also be done to investigate teachers' attitudes toward the teaching of test-wiseness skills or the evaluation of test-taking strategy competence in teachers



Given that tests are increasingly being administered using ICT, corresponding test-wisness skills will inevitably develop. It is therefore suggested that more research be conducted to expand the taxonomy of test-wisness.

The findings of this study indicate that the Kenyan secondary students practiced test wisness skills. Therefore, a repeat study could also be conducted with tertiary level students.

## REFERENCES

- Anastasi, A. (1976). *Psychological testing*, (4th ed.) New York: Macmillan
- Angoff, W. H. (1989). *Does guessing really help?* *Journal of Educational Measurement*. 26 (4), 323-336. American Educational Research Association. (1999). *Standards for educational and psychological testing*. Washington, DC:
- Ardiff, M. B. *The relationship of three aspects of test-wiseness to intelligence and reading ability in grades three and six*. *Unpublished Masters Thesis*, Cornell University, 1965.
- Bajtelsmit, J. W. (April 1975a). *The efficacy of test-wiseness and systematic desensitization programs for increasing test-taking skills*. Paper presented at the annual meeting of the National Council on Measurement in Education, Washington, D.C.
- Bajtelsmit, J. W. (October 1975b). *Development and validation of an adult measure of secondary cue-using strategies on objective examinations: The test of obscure knowledge (TOOK)*. Paper presented at the annual meeting of the Northeastern Educational Research Association, Ellenville, New York,
- Benson, J. (1988). American Psychological Association. (1985). *Standards for educational and psychological testing*. Washington, DC: American Psychological Association.
- Brown, A. L. (1980). *The psychometric and cognitive aspects of test-wiseness: A review of the literature*. In M. H. Kean (Ed.), *Test-wiseness* (pp. 1-25). Bloomington, IN: Phi Delta Kappan.

- Brown, A. L. (1987). Metacognitive development and reading. R. J. Spiro, B. C. Bruce, & W. F. Brewer (Eds.), *Theoretical issues in reading comprehension* (pp. 453-481). Hillsdale, NJ: Erlbaum.
- Callenbach, C. (1973). The effects of instruction and practice in content-independent test-taking techniques upon the standardized reading test scores of selected second grade students. *Journal of Educational Measurement*, 1973, 10, 25-30.
- Crehan, K. D., Koehler, R. A., & Slakter, M. J. (1974). Longitudinal studies of test-wiseness. *Journal of Educational Measurement*. 11,209-212.
- Diamond, J. J., & Evans, W. J. (1972). Metacognition, executive control, self-regulation and other even more mysterious mechanisms. In F. E. Wienert & R. H. Kluwe (Eds.), *Metacognition, motivation, and understanding* (pp. 65-116). Hillsdale, NJ: Erlbaum.
- Ebel, R. L., & Damrin, D. E. (1960). An investigation of the cognitive correlates of test wiseness. *Journal of Educational Measurement*, 9, 145-150.
- Erickson, M. E. (1972). Test sophistication: An important consideration. *Journal of Reading*. 16, 140-144.
- Ericsson, K. A., & Simon (1993). *Protocol analysis* (Rev. ed.). Cambridge, MA: The MIT Press.
- Flavell, J. H. (1979). Tests and examinations. In C. W. Harris (Ed.), *Encyclopedia of educational research* (3rd ed.). New York: Macmillan.
- Ford, V. A. (1973). *Everything you want to know about test-wiseness*.

- Gaines, W. G., & Longsma, E. A. (1974, April). *The effect of training in test taking skills on the achievement scores of fifth grade pupils*. Paper presented at the annual meeting of the National Council on Measurement in Education, Chicago.
- Garner, R. (1990). Metacognition and cognitive monitoring. *American Psychologist*, 34, 906-911.
- Gibb, B. G. (1964). *When children and adults do not use learning strategies: Toward a theory of settings*. *Review of Educational Research*, 60, 517-529.
- Gibb, B. G. *Test-wiseness as secondary cue response*. (Doctoral dissertation, Stanford University) Ann Arbor, Michigan: University Microfilms, 1964. No. 64-7643.
- Gross, L. J. (1976, April). *The effects of three selected aspects of test-wiseness on the standardized test performance of eight grade students*. Paper presented at the annual meeting of the National Council on Measurement in Education, San Francisco
- Messick, S. (1989). *Test-wiseness as a secondary cue response* (Doctoral dissertation, Stanford University). Ann Arbor: University Microfilms, No. 64-7643.
- Millman, J. (1966). *Test-wiseness in taking objective achievement and aptitude examinations* (Final report). New York: College Entrance Examination Board.
- Millman, J. (1966). Validity. In R. L. Linn (Ed.), *Educational measurement* (3rd ed., pp. 13-103). Washington, DC: American Council on Education and Macmillan Publishing Co.
- Millman, J., & Setijadi A comparison of the performance of American and Indonesian students on three types of test items. *Journal of Educational Research*, 1966, 59, 273-275.

- Millman, J., Bishop, H., & Ebel, R. (1965). *Test-wiseness in taking objective achievement and aptitude examinations*. Final Report. Princeton, NJ: College Entrance Examination Board.
- Nilsson, I. *The occurrence of test-wiseness and the possibility of inducing it via instruction-a cross-sectional study*. Educational Reports, UMEA, No. 8, 1975.
- Oakland, T. (1972). *The effects of test-wiseness material on standardized test performance of preschool disadvantaged children*. *Journal of School Psychology*, 10, 355-360.
- Princeton, NJ: *Educational Testing Service*. (ERIC Document Reproduction Service No. ED 093 9 12)
- Rogers, W. T., & Bateson, D. J. (1991). *An analysis of test-wiseness*. *Educational and Psychological Measurement*, 25, 707-726. Ministry of Education. (1988). *Biology 12*. Victoria, BC: Ministry of Education.
- Sarnacki, R. E. (1979). *The determinants of reading comprehension*. *Educational and Psychological Measurement*, 22, 269-286. *The influence of test-wiseness upon performance of high school seniors on school leaving examinations*. *Applied Measurement in Education*, 4, 159-183.
- Sax, G., & Carr, A. (1962). *An investigation of response sets on altered parallel forms*. *Educational and Psychological Measurement*, 22, 371-376.
- Schuell, T. J. (1986). *An examination of test-wiseness in the cognitive test domain*. *Review of Educational Research*, 49, 252-279. 350 *Journal of Experimental Education*

- Slakter, M. J., Koehler, R. A., & Hampton, S. H. (1970) Cognitive conceptions of learning. *Review of Educational Research*, 56, 411-436..
- Smith, J. K. (1980, April). Grade level, sex, and selected aspects of test-wisness. *Journal of Educational Measurement*, 7, 119-122.
- Stanley, J. C. (1971). *The convergence strategy of test-wisness*. Paper presented at the annual meeting of the American Educational Research Association, Boston.
- Sullivan, B. M. (1988). Reliability. In R. L. Thorndike (Ed.), *Educational measurement* (2nd ed., pp. 356-442). Washington, DC: American Council on Education.
- Thorndike, R. L. (1951). A legacy for learners. *The Report of the Royal Commission on Education*. Victoria, BC: Ministry of Education.
- Vernon, P. (1962). Reliability. In E. F. Lindquist (Ed.), *Educational measurement* (pp. 560-620). Washington, DC: American Council on Education.
- Wahlstrom, M., & Boersma, F. J. (1968). *The influence of test-wisness upon achievement*. *Educational and Psychological Measurement*, 28, 413-420.
- Weiten, W. (1984). *Violation of selected item construction principles in educational measurement*. *Journal of Experimental Education*, 52, 174- 178.

## APPENDICES

### Appendix A: Consent form

I understand that my participation in this study is strictly voluntary and I may discontinue my participation at any time without fear of negative outcome to me. That the information collected about me during the study will be held in confidence and will not be part of a permanent record nor will it affect my grades in school or KCSE.

Sign.....Date.....

## Appendix B: Teacher's Questionnaire

### PERSONAL INFORMATION

<b>Gender</b>	Male					Female		
<b>Type of school</b>	National		County			District		
	Boys		Girls			Mixed		
<b>Academic level</b>	PHD		Masters		Bachelors		Diploma	Certificate
<b>Experience</b>	5yrs and below		6-10 years		11-15 years		16-20 years	Over 20 years
<b>Subject Area</b>	Languages				Sciences		Arts	Maths
<b>School's Mean score last year (2011)</b>								

*Thank you for participating in this study*

Kindly answer all the questions by ticking below the most relevant response to each question. If there is anything that you do not understand, please feel free to ask the researcher.



A) i) Have you ever heard of the word test wiseness? Yes

No

ii) If Yes, write what you think it means.....

.....

When preparing my students for an exam, I advise them to:-

			Strongly agree	Agree	Neutral	Disagree	Strongly Disagree
A	1	Begin to work as rapidly as possible with assurance of accuracy					
	2	Set up a schedule for progress through the test					
	3	Never omit or guess at items which resist a quick response					
	4	Mark omitted items to be considered after going through the test.					
	5	Use time remaining after completion of the test to reconsider answers					
	6	Never listen carefully to directions					
	7	Take time to understand the question					
	8	Ask examiner/Invigilator for clarification when necessary, if it is permitted					
	9	Never check all answers before handing over the exam paper					

B. In a multiple choice exam a student should,

		Strongly agree	Agree	Neutral	Disagree	Strongly Disagree
10	Always guess if right answers only are scored					
11	Always guess even if correction for guessing formula is to be used.					
12	Eliminate options which are known to be incorrect and choose from among the remaining options.					
13	Choose neither or both of two options which imply the correctness of each other.					
14	Choose neither or one (but not both) of two options, one of which if correct would imply the incorrectness of the other.					
15	Never make use of relevant content information in other test questions and options					

16	Restrict choice to those options which encompass all of two or more given statements known to be correct.					
17	Read all the alternatives first before choosing an answer.					
18	If alternatives range in value, choose from the extremes and not the means.					

*Thank you for participating in this study*

### Appendix C: Student's Questionnaire

Thank you for accepting to participate in this research. The researcher is a Masters student in Education (Measurements and Evaluation) at the University of Nairobi. This research aims at establishing effect of test-wiseness on academic performance of secondary school students in Machakos district.

Kindly answer all the questions by ticking below the most relevant response to each question. If there is anything that you do not understand, please feel free to ask the researcher.

A] Have you ever heard of the word **test wiseness**? Yes  No

If Yes, write what you think it means.....

B. When preparing for an exam, a student should:-

		Strongly agree	Agree	Neutral	Disagree	Strongly Disagree
1	Begin to work as rapidly as possible with assurance of accuracy					
2	Know how much time is allowed as this governs his/her strategy					
3	Never omit or guess at items which resist a quick response					
4	Mark omitted items to be considered after going through the test.					
5	Never use time remaining after completion of the test to reconsider answers					
6	Listen carefully to directions					
7	Take time to understand the question					
8	Ask teacher/invigilator for clarification when necessary, if it is permitted					
9	Check all answers before handing over the exam paper					

B. In a multiple choice exam a student should

		Strongly agree	Agree	Neutral	Dis agree	Strongly Dis agree
10	Never guess if right answers only are scored					
11	Avoid guessing if correction for guessing formula is to be used.					
12	Eliminate options which are known to be incorrect and choose from among the remaining options.					
13	Choose neither or both of two options which imply the correctness of each other.					
14	Choose neither or one (but not both) of two options, one of which if correct would imply the incorrectness of the other.					
15	Never use hints from questions you know to answer questions you do not know.					
16	If you know two of three options seem correct, "all of the above" is a strong possibility.					

17	Read all the alternatives first before choosing an answer.					
18	If alternatives range in value, choose from the extremes and not the means.					

*Thank you for participating in this study*

## Appendix D: Taxonomy of Test-wiseness Principles

### 1. Elements independent of test constructor or test purpose.

#### A. Time-using strategy.

- i) Begin to work as rapidly as possible with reasonable assurance of accuracy.
- ii) Set up a schedule for progress through the test.
- iii) Omit or guess at items (See 1. C and II. B.) which resist a quick response.
- iv) Mark omitted items, or items which could use further consideration, to assure easy relocation.
- v) Use time remaining after completion of the test to reconsider answers.

#### B. Error-avoidance strategy.

- i) Pay careful attention to directions, determining clearly the nature of the task and the intended basis for response.
- ii) Pay careful attention to the items, determining clearly the nature of the question.
- iii) Ask examiner for clarification when necessary, if it is permitted.
- iv) Check all answers.

#### C. Guessing strategy.

- i) Always guess if right answers only are scored.
- ii) Always guess if the correction for guessing is less severe than a "correction for guessing" formula that gives an expected score or zero for random responding.



- iii) Always guess even if the usual correction or a more severe penalty for guessing is employed, whenever elimination of options provides sufficient chance of profiting.

#### D. Deductive reasoning strategy.

- i) Eliminate options which are known to be incorrect and choose from among the remaining options.
- ii) Choose neither or both of two options which imply the correctness of each other.
- iii) Choose neither or one (but not both) of two statements, one of which, if correct, would imply the incorrectness of the other.
- iv) Restrict choice to those options which encompass all of two or more given statements known to be correct.
- v) Utilize relevant content information in other test items and options.

## **II. Elements dependent upon the test constructor or purpose.**

#### A. Intent consideration strategy.

- i) Interpret and answer questions in view of previous idiosyncratic emphases of the test constructor or in view of the test purpose.
- ii) Answer items as the test constructor intended.
- iii) Adopt the level of sophistication that is expected.
- iv) Consider the relevance of specific detail.

B. Cue-using strategy.

1. Recognize and make use of any consistent idiosyncrasies of the test constructor which distinguish the correct answer from incorrect options.

- i) He makes it longer (shorter) than the incorrect options.
- ii) He qualifies it more carefully, or makes it represent a high degree of generalization.
- iii) He includes more false (true) statements.
- iv) He places it in certain physical positions among the options (such as in the middle).
- v) He places it in a certain logical position among an ordered set of options (such as the middle of the sequence).
- vi) He includes (does not include) it among similar statements, or makes (does not make) it one of a pair of diametrically opposite statements.
- vii) He composes (does not compose) it of familiar or stereotype phraseology.
- viii) He makes it grammatically inconsistent with the stem.

2. Consider the relevancy of specific detail when answering a given item.

3. Recognize and make use of specific determiners.

4. Recognize and make use of resemblances between the options and an aspect of the stem.

5. Consider the subject matter and difficulty of neighbouring items when interpreting and answering a given item.

From "An Analysis of Test-Wiseness" by J. Millman, C. H. Bishop and R. Ebel,  
Educational and Psychological Measurement, 1965, 25, 707-726. Copyright 1965 by  
Educational, and Psychological Measurement. Reprinted by permission