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Teachers' Perceptions Of Students' Mathematics Guidance And Counselling Needs: A Case Of Secondary Schools In Maara District, Kenya

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Abstract

School counsellors collaborate with teachers, parents, school administrators and the local community in an attempt to influence students' academic, social, personal and career domains. Basically, mathematics teachers hold key information necessary for identifying pertinent guidance and counselling needs related to students' achievement in the subject. Therefore, to facilitate school counsellors' role in providing comprehensive mathematics counselling services to students, this study sought to assess teachers' perceptions of students' mathematics guidance and counselling needs in secondary schools within Maara District, Kenya. The study utilized the descriptive survey research design on a sample comprising Heads of Mathematics Departments from 48 secondary schools in the District. Questionnaires were used for the collection of desired data which was analyzed by use of Statistical Package for Social Sciences version 17.0. The findings indicated that secondary school students needed mathematics guidance and counselling services regarding attitude, study habits and test orientation. Thus, it was recommended that guidance and counselling programmes emphasize treatment of students' negative attitude, study habits and test orientation in order to enhance progress in mathematics achievement.

Key Words: Counselling, Mathematics, Perceptions, Assessment.

1. Introduction

Mathematics is compulsory for most basic educational curriculums around the globe and students' proficiency in the subject is highly valued generally because of its wide application in real life situations (Maria, Vera & Francisco, 2012). However, the complexity of the teaching/learning situation largely curtails students' understanding of mathematics concepts, procedures, strategies and reasoning (Glenda & Walshow, 2009). Such complexities are alleged to be inherent in attitudes, classroom environments, teaching/learning techniques, assessment procedures and past experiences with the subject (Goodykoontz, 2008). Fortunately, the Kenyan Government in partnership with the Japanese Government has taken the initiative to expose mathematics teachers to varied and effective student centered instructional techniques through nationwide in service training (Mwei, Too & Wando, 2011). Therefore, mathematics teachers in Kenyan secondary schools are well vast with challenges that students encounter, and also the techniques necessary in countering such challenges. In spite of the acquired instructional skills and techniques, the mathematics teachers are constrained in their effort to assist students succeed in the subject by large classes; wide syllabus; insufficient teaching/learning resources; heavy work load; and limited time occasioned by fixed school programmes (Musasia, Nakhanu & Wekesa, 2012). Indeed, school counsellors may support mathematics teachers by offering specific academic intervention programmes with regard to issues of attitude, organizational skills, study habits, group work, time management and classroom participation among others (Mutie & Kyungu, 2011). Thus, educating school counsellors about areas of contention in the mathematics teaching/learning process may equip them with a knowledge base upon which comprehensive and appropriate intervention strategies and programmes can be designed. For this reason, mathematics teachers' perceptions of pertinent guidance and counselling needs related to students' study and achievement in the subject are crucial, hence, the rationale for this study.

2. Objectives

This study was based on the following objectives:

i. To determine teachers' perceptions of students' attitudes related to mathematics achievement among secondary school students
ii. To determine teachers' perceptions of students' study habits related to mathematics achievement among secondary school students
iii. To determine teachers' perceptions of students' test orientation related to mathematics achievement among secondary school students

3. Methodology

The descriptive survey research design was employed for this study which explored teachers' perceptions of students' mathematics guidance and counselling needs in secondary schools within Maara District, Kenya. The study targeted heads of mathematics departments in Maara District who were preferred because they were deemed to have the most relevant information for the study owing to extensive teaching experience and exposure to other administrative tasks in the department. Thus, the sample comprised Heads of Mathematics Departments purposively selected from the 48 secondary schools in Maara District, Kenya. Custom made questionnaires with both open ended and rated test items were used for the collection of desired data. The questionnaire test items were categorized according to the research objectives and also included was a section on demographic characteristics of respondents. Permission to conduct this study was granted by the National Council of Science and Technology after which a pilot study was conducted to ascertain the reliability of the questionnaires whose validity was improved through opinions and expert judgment of the University Supervisors. A reliability coefficient of 0.782 obtained using Chronbanch's Alpha Coefficient was considered appropriate. Regarding the administration of the questionnaires, informed consent was obtained from the participants who were then assured of confidentiality before completing the questionnaires. The participants voluntarily completed the questionnaires which were after wards collected for data analysis. After all the questionnaires were collected, thematic analysis of the open ended test items was done. Further, themes from open ended items and quantitative data from rated test items were coded and then entered into the computer for analysis by use of Statistical Package for Social Sciences version 17.0. Percentages and frequency counts were utilized for the data analysis whose results were represented on tables.

4. Results of the Study

This section contains analysis results of the data obtained from this study regarding teachers' perceptions of attitudes, study habits and test orientation related to mathematics guidance and counselling needs among secondary school students.

4.1 Demographic Characteristics

Regarding the gender of the heads of mathematics departments who participated in the study, out of the 9 18.75% were female while 81.25% were male. This scenario confirms the allegation that there are more male successful mathematicians than there are female (). In addition, the majority comprising 43.75% were aged between 51 years and 60 years. Still, 37.5% were within the age bracket 41 years to 50 years while 18.75% were aged between 31 years and 40 years. This implies that most heads of mathematics departments had considerable experience in the teaching of the subject. Professionally, most of the heads of mathematics departments comprising 93.75% had a Bachelor's Degree of Education and the remaining 6.25% were qualified with a Diploma in Education.

4.2 Students' Attitude and Mathematics Counselling Needs

Data were sought concerning perceptions of the heads of mathematics departments on students' attitude related to mathematics achievement. Table 1 displays the results from data on a five level likert scale on which the heads of mathematics departments noted their perceptions about the extent of agreement or disagreement with the indicated attitudinal statements. Levels on the likert scale included: Strongly Disagree (SD), Disagree (D), Undecided (U), Agree (A) and Strongly Agree (SA).

Table 1. Mathematics Heads' Opinions on Attitude Towards Mathematics

Statement	S D (%)	D (%)	A (%)	S A (%)
Students portray low self esteem about mathematics.	0	0	33.3	66.7
Most students complain that mathematics difficult.	0	0	33.3	66.7
Students are anxious about mathematics study.	0	0	22.2	77.8
Students seem content with low mathematics scores.	0	0	55.6	44.4
Students deliberately miss mathematics lessons.	33.3	66.7	0	0
Students lack the value for mathematics in life.	11.1	33.3	55.6	0
Students seem to dislike mathematics discussions.	0	0	77.8	22.2
Students display low motivation in mathematics study.	0	0	66.7	33.3

Majority of the heads of mathematics departments either agreed or strongly agreed with the negatively specified mathematics attitudinal statements. This means that mathematics seemed difficult to most students, students portrayed low self esteem about mathematics, students were anxious about mathematics study, the students seemed content with low mathematics scores, some students lacked the value for mathematics in life, students seemed to dislike mathematics discussions and also displayed low motivation in mathematics study. However, all the heads of mathematics departments disagreed or strongly disagreed that students deliberately missed mathematics lessons. This was attributed to the measures put in place by school administrators to ensure that students attend all the lessons. An example of such measures is the students' lesson attendance control forms which are signed by the respective subject teachers after each lesson. Regarding an item on the questionnaire requiring heads of mathematics' departments to point out any other negative attitude students had towards mathematics, the main feeling was that students feared consulting the mathematics teachers. In addition, students were considered as being too lazy to research, compile and work out mathematics problems from revision booklets and past papers. There was also another view that most students always expected to fail in mathematics and therefore little effort was put into revision and practice. Further, majority of the heads of mathematics departments felt that most students seemed not sure of the work done during mathematics lessons and hardly bothered to ask for clarification.

4.3 Students' Study Habits and Mathematics Counselling Needs

The heads of mathematics departments were expected to indicate their perceptions of students' study habits related to mathematics achievement whose results of data analysis on Table 2 are represented on a five level likert scale including: Strongly Disagree (SD), Disagree (D), Undecided (U), Agree (A) and Strongly Agree (SA).

Table 2. Mathematics Heads' Opinions about Students' Mathematics Study Habits

Statement	A (%)	S A (%)
Students complain that mathematics formulas are complicated.	55.6	44.4
Students rarely consult mathematics teachers.	66.7	33.3
Students tend to avoid participating in mathematics lessons.	88.9	11.1
Students have no mastery of concepts.	44.4	55.6
Students do not make their own mathematics notes.	22.2	77.8
Rote learning generates stress in mathematics study.	44.4	55.6
Students' ignorance of prior concepts hinders progress.	11.1	88.9
Students postpone their mathematics study.	66.7	33.3

As indicated on Table 2, all the heads of mathematics departments either agreed or strongly agreed with the negatively described statements on students' mathematics study habits. Therefore, it can be deduced that students found mathematics formulas complicated, rarely consulted mathematics teachers, avoided participating in mathematics lessons, lacked the mastery of mathematics concepts, did not make their own mathematics notes and postponed their mathematics study. Rote learning was also perceived to generate stress in mathematics study while ignorance of prior concepts hindered progress in learning.

Besides, the following themes emerged from heads of mathematics departments' responses on an item in the questionnaire requesting them to indicate any other improper mathematics study habits exhibited by the students: students do not make personal notes in mathematics; sometimes students read mathematics exercise books like a novel; students do not revise mathematics concepts; students fail to connect the relationship between concepts; students avoid studying some topics; and students rarely read ahead of the teacher.

4.4 Students' Test Orientation and Mathematics Counselling Needs

The percentages depicting perceptions of the heads of mathematics departments on the extent of agreement or disagreement with statements about challenges students face during mathematics examinations were computed. Table 3 represents the data analysis results on a five level likert scale including: Strongly Disagree (SD), Disagree (D), Undecided (U), Agree (A) and Strongly Agree (SA).

Table 3. Mathematics Heads' Opinions on Students' Mathematics Test Orientation

Statement	**A (%)**	**S A (%)**
Time management during mathematics test.	22.2	77.8
Clear and neat presentation of test solutions.	22.2	77.8
Interpreting word problems.	100	0
Applying mathematics concepts to test items.	66.7	33.3
Prioritizing the working out of test items.	66.7	33.3
Reducing mathematics test anxiety.	22.2	77.8
Following test instructions.	33.3	66.7
Techniques of maximizing test scores.	22.2	77.8

Information on Table 3 indicates that all the participants agreed or strongly agreed with all the statements regarding challenges students faced while taking mathematics examinations. Therefore, it appears that students required psychological intervention about issues such as time management during mathematics test, clear and neat presentation of test item solutions, interpretation of word problems, application of mathematics concepts to test items, prioritizing the working out of test items, reduction of mathematics test anxiety and techniques of maximizing the test scores.

Further, when asked to highlight other challenges students faced while taking mathematics examinations, the perceptions of heads of mathematics departments generated the following thematic clusters: ignorance about mathematics concepts; ability to connect the relationship between various concepts; proper use of the calculators; and recognizing concepts in the context of various questions.

5. Discussion of the Results

Attitude towards learning of mathematics determines whether a student will excel in the subject or not (Maria, Vera

& Francisco, 2012). Basically, it appears that the negative mathematics attitudinal attributes exhibited by secondary school students contributed to low achievement in the subject. In particular, the lack of motivation, contentment with low achievement and disregard of mathematics' value in life tend to create an unfavourable classroom learning environment (Akinsola & Olowojaiye, 2008). As a result, seasoned teachers who have all the required mathematics teaching skills may find it difficult negotiating through a lesson with such students. Besides, lack of confidence in mathematics study exemplified by students' notion that mathematics is difficult may have lead to development of a mental block thus disinterest in the subject (Adedeji, 2007). Apparently, these negative attitudes seem to evolve from factors such as negative beliefs, discouraging talks about the subject, pressure to perform, over demanding tasks, uninteresting lessons and teacher orientation (Musasia, Nakhanu & Wekesa, 2012). Hence, in support of mathematics teachers, school counsellors may seek to improve the mathematics classroom environment by working through underlying causal factors in order to change the students' attitude and enhance intrinsic motivation to study the subject.

In essence, attitudes tend to shape behaviour (Maria, Vera & Francisco, 2012) and as such, data analysis results indicated that secondary school students displayed inappropriate mathematics study habits. For instance, attitudes like anxiety and lack of motivation in mathematics may have resulted into inappropriate study habits such as procrastination, non participation in class and resistance in making personal notes. Consequently, students were likely to develop knowledge gaps in the subject, hence, lacking in mastery of basic concepts. This finding is in agreement with the view that an understanding of basic arithmetic skills is fundamental for making progress in advanced mathematics study (Lunsford & Poplin, 2011). Technically, school counsellors may intervene by relating to students the importance of conceptual understanding and interrelationship with regard to mathematics study. When students realize that mathematics is a progressive subject which requires mastery of earlier concepts for the understanding of current content, then teacher consultation and peer support or discussion groups may become valuable study resources (Maria, Vera & Francisco, 2012). Moreover, most students hardly made mathematics notes during personal study but instead relied on lesson notes a situation which may have contributed to them rarely reading ahead of the teacher. While reading ahead of the teacher may facilitate attentiveness and participation during lessons, making personal notes aids memory of concepts, formulae and procedures (SMASSE, 1998). Thus, counselling strategies and programmes that inculcate note making skills and techniques of reading ahead of the teacher among students may bring about considerable progress in mathematics study and achievement. Advocacy for teacher's adjustment of instructional techniques may also alleviate some study difficulties and enable students to comprehend and apply mathematical concepts (Saritas & Akdemir, 2009).

The thought of taking a mathematics test causes considerable anxiety especially among students of average and low ability as well as high achievers who are ill prepared for the test (SMASSE,1998). Thus, given the identified negative attitudes and inappropriate mathematics study habits, it is not surprising that secondary school students portrayed problems with regard to taking mathematics tests. Students' issues with application of concepts, time management, presentation of test item solutions, interpretation of word problems and test anxiety are functions of attitudes and study habits. Therefore, the spiral effect of negative attitudes and inappropriate study habits transcend into test taking challenges which in effect lead to low achievement. Persistent low achievement is generally purported to be a precursor for negative attitude towards mathematics (Maria, Vera & Francisco, 2012). Hence, to break the vicious cycle of low mathematic achievement which entails negative attitudes, inappropriate study habits and distorted test orientation, school counsellors and other education stakeholders should strive to mitigate against facilitating factors and make a link between education goals and students' achievement in mathematics (Saritas & Akdemir, 2009). Still, it is important for school counsellors to invite subject facilitators to sensitize students on competent test orientation such as understanding of test instructions, choice of optional questions, scoring of test items, test anxiety, optimizing test scores and clear presentation of test item solutions.

6. Recommendations

The following recommendations were made based on the results of this study:

i. School counsellors should psychologically treat the negative attitudes towards mathematics among secondary school students by offering psychotherapy to individuals and groups, facilitating peer counselling sessions, organizing social support groups and inviting motivational speakers in mathematics.
ii. School counsellors should strive to improve students' mathematics study habits by initiating a positive culture in mathematics study; guiding students on how to be attentive and active during lessons; encouraging students to read ahead of the teacher; organizing peer teaching sessions; encouraging participation in mathematics competitions; and advocating for a rich mathematics school environment in terms of educational resources including time for mathematics activities.
iii. Subject facilitators in mathematics should be engaged to regularly give lectures to students concerning mathematics test orientation particularly on interpretation of test items; recognition of concepts in context; techniques of maximizing test scores; neat and clear presentation of test item solutions; and appropriate use of calculators.

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