AN INVESTIGATION ON CAUSES AND IMPACT OF POOR MATHS PERFORMANCE BY GIRLS IN KIAMBAA DIVISION KIAMBU DISTRICT

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DECLARATION

I declare that this report is my original work and has not been presented to any other examination board.

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SIGN.....

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Date: 18/04/09

APPROVAL

This work project has been approved by the supervising lecturer.

Mr. A Kimwise

Sign……

KAMPALA INTERNATIONAL UNIVERSITY

DEPARTMENT OF I.O.D.L

DEDICATION

1. This project is dedicated to:
    I. K.G.C – Banana community
    II. Congress –W.B.N [Global]
2. The project is specifically dedicated to my 2 daughters –May you live to serve your generation.
3. To all math's teachers in Kenya, Africa and the rest of the world who intend to create an impact in the world of mathematics.
4. To all curriculum developers who intend to make Math's more applicable in the 21st century. This work piece is of great help.

ACKNOWLEDGEMENT

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3. My classmates, colleagues at work in Muthurwa School and the N.Y.S. school of engineering, Math's teachers and students who assisted the data collection .To all thanks.
4. Special thanks to Mrs. J.N. Kabita, former Muthurwa Secondary School Principal and the new Principal Mrs. J. Mureithi for making this project possible.
5. Finally, a lot of thanks to my old mother for her support .Thanks a lot Mum.

DEFINATION OF TERMS AND ABREVIATIONS

ABREVIATIONS

I.	D.E.O	-	Divisional Education officer
II.	D.E.O	-	District Education Officer
III.	D.S	-	Day scholar
IV.	B.S	-	Boarding School
V.	S.M.A.S.E	-	Strengthening Maths and Science Education.

ABSTRACT

Deterioration and depreciation of low performance in Math's by girls is a worrying point in Kenya. For the past 20 yrs since the inception of 8-4-4 the trend has been constant and like HIV pandemic, the scenario has become a national catastrophe.

The global trends in the present world are that the world is going digital. Modern technology and computers have taken root foundation in Math's and therefore if the problems are not addressed amicably our young girls will remain dogimes and non –partakers of the present technology.

It is for this reason that the researcher felt convicted first to know the genesis of the problem and possible solutions to the problems. The researcher carried out his research work and the methodology used was questionnaires and interviews.

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CHAPTER ONE

INTRODUCTION

1.0 BACKGROUND OF THE PROBLEM

Since the introduction of the 8-4-4 system of education in the country 20 yrs ago, the performance in Math's by girls has been going down year by year. Every time the Kenya National Examination council (KNEC) announces the results, the chorus has been constant. "The subject which was poorly performed was Math's especially by girls" says the Education Minister.

However the major problem is not only regional nor national but also a global problem since statistics indicates that very few girls study Math's at advanced levels. The following logistics shows the declining performance by the girl's students for the past 20 yrs at the National level.

	A	D	E
1985-1990	Nil	13%	87%
1991-1995	Nil	09%	91%
1996-2003	2	4%	94%

Global statistics also indicates that the trend of Mathematics by girls is very alarming. In 1990 professor Purp of New state university in Morocco said that "There could be possible elimination of math's subject in girl's schools because all of them are failing terribly"

Between 1989-2003 only 10% of girls undertook Math's in Asia at an advanced level and only 3% completed.

Between 1990-2000-Europe had only 5% of girls taking math's at an advanced level and only 2% completed.

Between 1985-1999 American girls performed even poorly – 2% took Mathematics at an advanced level and 0.5% completed. From a global performance the following is the order.

1.5 LIMITATIONS OF THE STUDY

- Failure of the relevant authority e.g. Math's teachers to give information.
- Sensitivity to the problem caused the party affected i.e.girls to shy off from participating.
- Field problem e.g. bad weather.

1.6 THE SCOPE OF THE STUDY

The study was specifically set on in secondary schools and more specifically in Kiambaa Division – Kiambu district. However comparisons were made with other neighboring districts of the same province.

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 INTRODUCTION

The chapter examines what is known as regards to the importance of Mathematics and factors that contributes to the poor performance as noted by various authorities and researchers. In particular, the parents, teachers, learners and their environment school facilities have been critically looked into.

2.2 THE IMPORTANCE OF MATHEMATICS

Mathematics is one of the most key important subjects not only in the regional or national level but at an International level. At the national level, the Act of parliament in the education sector authorizes the subject to be taught in all levels from nursery –primary – secondary-tertiary – university level. From this Act therefore, the essence of Math's can't be under/ emphasized.

At the international level, the Micro – soft Icon Dr. Bill Gates once said – The progressive development of new computer software's is inline with the new Mathematics for the 21st century.

The designer and creator of the universe "The Almighty God" in the entire good book gave Mathematic specification in every building He commanded to be built- In Exodus 25:40, He tells Moses to build the Tabernacle according to the divine specifications i.e. The length, the height and the breadth with the given measurements.

Mento – (18th Century) – one of the greatest philosophers of his time once said – "Mathematics and Mathematicians are true prophets who inspires other s to think beyond the box".

It is therefore fundamental requirement that all institutions of higher learning e.g. Tertiary colleges and universities insists on a compulsory pass in Math's as a pre-requisite to their entry. Despite this vital importance of this subject, girls continue to perform not only poorly but extremely poorly and therefore research needs to be carried out in order to establish factors affecting poor performance of the subject.

2.3 FACTORS AFFECTING PERFORMANCE IN MATHS

2.3.1 NATURE OF THE SUBJECT

Mathematics in its appearance is both an art and a science in nature thereby making it very abstract. It is his appearance that makes it in attractive to students, eventually wondering its applicability in their daily lives. In line with this misconception, a mental readjustment is required in our young girls to see the relevancy of this subject in their daily lives.

2.3.2 FACILITIES AND RESOURCES

Deterioration of educational standards often results from lack of adequate facilities and resources. This entails the physical factors as well as the general learning environment. In his study of educational performance in Bungoma District Mr. Khaemba (1986) equated poor results to lack of proper classrooms, desks and textbooks as some of the factors that hinder effective learning. A similar case had been absorbed in the standard newspaper 1982 (10:10 – 82) Education column pg 13 that:

"Classes are too big to be handled by efficient and devoted teachers. More and more students are given on –existential places in schools. They have no books, often no desks and chairs and even classrooms built for 30 to 35 students can hold or accommodate 46 or even more. "There is no room for a teacher's desk and still less a chair". The quoted statement is very solid and comprehensive .cognition means increased learner teacher ratio thereby limiting the teacher's attention to all the students particularly the slow learners.

Prof. Eshiwani 1983 points out the library as one of the key necessary if effective learning is to take place. Schools which lack such facilities and modern text books perform very poorly.

The principal muranga teachers college(MTC) commenting on the performance of maths said; negative attitudes and mistaken notion among teachers and students have affected the learning of this maths subject i.e. lack of well inspired teachers

(people daily 18-8-2006).in her research work and findings madam pr Mbwiria found out that:

a) Kenyan girls have a wide range of attribution in addition to those identified by leader (1958).
b) Black girls feel less in control of their performance when compared to their white counter parts.
c) Negative feelings and thoughts about maths critical to their achievement and motivation.
d) Lifestyle, nature of attribution and social values has highly influenced the performance of maths.

In his article "so many hungers amidst plenty"-published on 14-10-2006 Saturday nation. J. Morris-executive director U.N (WFP) compiled the following facts in relation to Math's, learning and the girl child.

1. Researchers have documented that young children who are malnourished tend to grow up with significantly lower IQ than those who are well fed putting them behind the curve in our competitive world from the outset.
2. Recent research from Chile first established a direct link between brain volume and IQ i.e. the larger the brain the higher the IQ.
3. Given that 70% of our brain growth occurs in the 1st 2 years of our lives the Chilean research showed that Malnutrition in the early childhood is likely to have a devastating effect on better mental performance.
4. Many other studies have shown that early malnutrition can have lasting effects on a child's ability to learn. A British research project examining 5000 people born in 1946 showed that those with low birth weights suffered damaging intellectual effect throughout childhood influencing school performance.

In addition to that, many millions of the poorest children girls especially from Niger, Chad and Bangladesh may not go to school at all or others attend school sporadically which diminishes them thereby loosing a potential of a whole generation.

In the S.M.A.S.E. project findings and suggestions by the school heads in relation to Mathematics suggestions and recommendation were made;

- Attitude change should be re – emphasized
- Teachers should be equipped with innovation skills
- The learner's processes of learning Mathematical skills and operations, thinking skills and competence should be the focus to teaching Math's.
- A program should be established to improve Mathematics and teachers pedagogical competence in teaching of Math's.
- Math's teachers should be involved in making instructional materials and resources.

CONCLUSION

This research will carry out a thorough investigation into these factors with a view of finding a solution to help improve Math's in Kiambaa – Kiambu District.

CHAPTER THREE

3.0 METHEDOLOGY AND RESEARCH DESIGN

3.1 INTRODUCATION

In the effort for the researcher to establish the causes of poor performance in Math's by girls in Kiambaa – Kiambu District, the research design and methodology used were mainly interviews and questionnaires.

The chapter also addresses the types of instruments that were used and how they were developed and applied.

3.2 LOCATION OF THE STUDY

The sample was drawn from 5 girl's schools in Kiambaa Division of Kiambu District which offers K.C.S.E Exams. The choice of this geographical area was dictated by time, money and accessibility factor. The researcher lives and works within the district which enabled him minimize expenses and operate within the set budget.

3.3 RESEARCH SAMPLE

The research was based on girl's schools because girls have been performing poorly in the subject. Sample cluster sampling was used with simple random sampling. The sample comprised of 5 girls schools , all their principals , area D.E.O, 2 Math's teachers in every school and 4 students from each school (from form 1 – 4). Thus there were 5 schools heads (Principals), one D.E.O, 20 students from 5 schools and 4 parents in the whole division selected through a rotary – systematic method.

3.4 SAMPLING TECHNIQUES

The targeted schools in the division were of different characteristics as was established by a pilot study prior to the research. This are:

- From the national rating, some schools were provincial, others district and others district day.
- Geographical location was also very different, some in the urban centers whereas others in the interior of the village.

To ensure that 5 schools which constituted the sample were represented the researcher divided the schools in order of their ranking also based on common characteristics. In choosing the sample of the students the researcher used simple random sampling (rotary) method.

The samples of the teachers constituted all Math's teachers and heads in the sample schools, this was because they ere few in number.

3.5 DATA COLLECTION METHODS

When collecting data 2 types of instruments were used in this study

i. Questionnaires
ii. Interviews

The questionnaires were of 4 types;

a) For school heads who were samples
b) For teachers
c) For students
d) For parents

3.5.1 SCHOOL HEADS (PRINCIPALS) QUESTIONAIRES

It sought information from the head – teachers about their position as pertains to the poor performance of the subject both towards students and teachers.

3.5.2 TEACHERS QUESTIONAIRES

It sought to know the teachers workload, methods of teaching, their findings and their relationship with the students.

3.5.3 STUDENTS QUESTIONAIRES

It sought the attitude of the students towards their Math's teachers and to the subject itself. Time allocated and forms of exams administered.

3.5.4 PARENTS QUESTIONAIRES

It was a brief questionnaire whose major aim was to establish whether parents are aware of their girl's poor performance in Math's and what they are doing towards it.

a) INTERVIEWS

The researcher had established that parents and students were shying away for a direct face to face interview and therefore interview was carried to principals and teachers only. Both the interview structures were governed by the questionnaires which had been professionally designed to save time, brief and to the point.

3.5.5 DATA COLLECTION PROCEDURES

The research instruments were pre-tested by the researcher to clarify the validity and reliability of the instruments. In the process some questions were re adjusted to suit the circumstances. The researchers took the questionnaires personally and even the interviews to the chosen schools and with the permission from the school administration, administered them to the teachers and sampled students. One week was given to the respondents to complete the questionnaires before collection. Appointments were booked with the school heads which all of them were honored.

CHAPTER FOUR

4.0 DATA ANALYSIS

The researcher used frequency tables and percentages to analyze the data collected.

4.1 TEACHER RELATED FACTORS

The major factors affecting Math's performance is teachers related factors .The researcher found out the following factors in relation to teacher contribution as indicated by table 2 below.

FACTORS	(%)
1. Teachers qualification	Above 95% of them are professionally trained
2. Work load	80% said that the workload is big
3. Time given or allocated	Over 50% complained of little time
4. Subject is very abstract	Over 90% said Math's is very abstract and uninteresting to students.
5. New methodology	90% admitted, new methods and teaching are required for the subject for this time.
6. Class size	80% said that some if not all classes are too big.

The table has not exhausted all things but a fundamental point to note is that the teachers is the entry point in all subjects. He/She can contribute +vely or –vely towards the subject. Traditionally it is known as Math's teachers are rough, arrogant and carefree of which the researcher established some of the facts to be true. Many of the Math's teachers also expressed their frustrations over the deep rooted –ve attitude girls have towards Math's which makes it very hard for them to deliver effectively.

One point came out so strongly which the researcher noted with concern is that some teachers even though trained professionally, do not like teaching but they are in profession not by calling but by convenience. This is dangerous because such teachers discharge off their frustrations to learners which kill their morale.

However the researcher came along other teachers who were very concerned and responsible thinking all through to come with ways of improving the subject. These are they who take the jobs as their call in life. More so 50% of the teachers are committed to their work.

4.2 STUDENT RELATED FACTORS

One of the factors investigated under student's factors is ATTITUDE. Scientists and psychologists define attitude as a response to stimuli. Researcher found out that 95% of all the girls interviewed had a very low and down attitude towards Math's, Math's teachers and themselves also. This attitude is a traditional believes that Math's is hard for girls, and also very tedious in solving.

Laziness was a key factor that was also cited by students themselves as well as the teachers. Students, the researcher understood only carry out their Math's work when the teacher is present. In the absence of a teacher they have no personal effort. Fear, inability to take risks, and poor brain development due to poor diet were factors that the researcher established as related to students poor performance. Scientists have found out that girls who live at the lake – side frequently eat fish, have a strong brain volume and structure than their counterparts who live in highlands. This is because fish contains zinc and calcium necessary for the brain formation. Also schools interviewed had a tradition of failing and so the tradition continues.

4.3 PARENTS RELATED FACTORS

The researcher in his intensive work found out that parents have so much contributed to the down fall of this subject by their daughters. Those whom the researcher interviewed responded as follows:

90% - Completely ignorant of the necessity of Math's in life.

80% - Failed in Math's in their schools so believe their daughters can't also make it.

70% - Have no link or touch or communication with their girls or teachers to know of their progress. The category also cares less whether their daughters pass or not.

5% - Despite the above the researcher found a few especially the modern young parents who are informed. This category makes every effort to discuss with both teachers and their girls. Some have hired private tutors to couch the girls for progress.

4.4 ENVIROMENTAL OR HOMERELATED FACTORS

The respondents were also interviewed about how environment both at home and within the school affects Math's performance. The samples have almost similar responses. The sample schools which the researcher used are within the same environmental setting though at different locations, but in the same division – Kiambaa Division, though most families who are well up have a tradition of not performing well in the national exams. The majority of parents are more business oriented (90% of them) than they are academically. Therefore academic excellence for them means nothing. In regards to this parental or guardian position, their girls have consciously or unconsciously taken after them. Very few of them (about 4%) go beyond form 4, for higher or tertiary education.

From table 1 contents the trend in performance was noted to decline steadily year by year. As the researcher found girls within that geographical area have a very poor primary background and since 70% of them join the sampled schools, they influenced one another –vely i.e. the poor group pressure transferred from one generation to another.

Another environmental factor the researcher noted with concern is that one of the most of the divisions local leaders i.e. political and other social leaders are of minimal education but very prosperous economically. This has not only affected Math's poor performance but overall academic decay in that region. The researcher came across a slogan used by the youngsters i.e. "Viongozi wetu, hawakusoma na wana pesa" (Our leaders never schooled much but they have money and wealth).

With such kind of a paradigm or thinking system the automatic results is a process with no destination. Other environmental factors include wrong religious order and structures which hardly advises parents and their children on the need of excellence. There are so many religious sectors in the region, which are fragmented with their own philosophies devoid of purpose. Political and religious leaders of the area offer no inspiration or advice to girls on career prospects.

CHAPTER FIVE

5.0 SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 INTRODUCTION

This chapter examines the key findings of the research and basing on these findings, it recommends policy measures to be implemented if Math's performance in K.C.S.E Kiambaa Division and nationally is to improve.

5.2 SUMMARY FINDINGS

The research revealed the following as factors that greatly influence Math's performance.

1) Math's syllabus content is very wide, making Math's look very abstract and therefore teachers are unable to complete the syllabus.
2) Low entry grades to secondary from primary schools. The problem starts from primary schools and escalates to secondary schools.
3) Teachers have highly attributed; they assume and believe that girls can't make it in Math's is very wrong.
4) Traditionally Math's teachers are viewed as enemies to the students and the society. They are treated with suspense, seen as cruel, arrogant and rude which in some cases is true.
5) Scarcity of textbooks, poor libraries or no libraries at all. An institution of learning can't be valid and legitimate without an established place of reference (Library).
6) Inability of the parent / guardians to offer inspiration to their girls and failure to act as their role models. In terms of career choice and other life related issues.
7) Political and religious interference, misguided leaders who are blind in the region have so much contributed to the failure of this subject. They offer no guidance.
8) Poor traditional methods of teaching and approach have made the subject uninteresting and unappealing to the students.

9) Diet – Poor eating habits is a major cause. Education at all levels nursery – primary – secondary – tertiary requires a well fed individual. Student in this region are not well fed.

10) Time allocated to this subject is very short. Being a compulsory subject and a prerequisite to join any institution of learning little time has contributed so much. Both teachers and students complained of time.

11) Attitude – The misguided distorted –ve attitude girls have towards Math's is the hallmark of the poor performance in this subject.

5.3 RECOMMENDATION

To remedy the worsening situation of Math's performance the researcher recommends the following measures to be taken;

1. Parents and their girls should be sensitized on the need of proper feeding diet to enhance the development of the body, soul and mind.
2. Being a compulsory subject for four (4) years, time allocated should be increased to enhance it efficiently.
3. Syllabus content should be re – structured and bulk unnecessary topics removed. This will help learners/ students see the necessity of Math's and its application in life.
4. Proper foundation should start from primary level. Learners carry the –ve attitude from primary to secondary level. To avert these learners from primary should be sensitized and informed about the necessity of Math's right from the primary level.
5. The focus of teaching Math's should be centered on:

- Learners learning processes
- Mathematical operations
- Thinking skills
- Competency

6. A program is necessary and should be established to improve Math's teachers pedagogical competence if possible embraces the new technology teaching.
7. Math's teachers should be involved in making instructional materials and resources.
8. The government should come up with exchange program for learners to exchange experience and know what their counterpart is doing in other countries and regions.
9. As a matter of national concern school libraries should be equipped with the latest books & Technology.
10. The students entry behavior should as well as other assessment should be recorded so as to monitor the progress of the student in terms of value addition.

5.4 RECOMMENDATION FOR FURTHER RESEARCH

In his research proposal, the researcher highlighted the poor Math's performance by girls is a national problem.

However, due to limited resources and time, he narrowed his research work to a given region as a sample (Division of Kiambaa) which represented the whole Kiambu District which the divisions falls into.

To this end therefore, the researcher recommends further research in other divisions at the national level to make comparisons. This will show the above mentioned factors affects performance.

Finally the research pays tribute to those other researchers who took initiative to research on the same in other parts / region of this country.

APPENDICES:

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THE QUESTIONNAIRE FOR DATA COLLECTION

PLEASE ANSWER THE QUESTIONS IN THIS QUESTIONNAIRE

SECTION D: ADMINISTRATORS

INSTRUCTIONS:

i. Do not write your name on this questionnaire.

ii. Answer the questions by ticking in the box provided

1. Are you aware of the poor performance of Maths by girls?
2. What is your opinion as concerns poor performance?

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3. What can you say about subject teachers?

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4. Do maths teachers relate well with their student?

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THE QUESTIONNAIRE FOR DATA COLLECTION

PLEASE ANSWER THE QUESTIONS IN THIS QUESTIONNAIRE

SECTION C: PARENT

INSTRUCTIONS:

i. Do not write your name on this questionnaire.

ii. Answer the questions by ticking in the box provided.

iii. Give explanation in the spaces provided.

1. Is your Son/Daughter a boarder or a day scholar?

2. What is your opinion towards daughter poor performance in mathematics?

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3. How often do you discuss the issue of Maths with your daughter?

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4. Do you see the subject teacher to discuss the issue with him/her over your daughter's poor performances?

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6. How often do you mark and give feedback to your student?

Immediately ☐ Not immediately ☐

7. Given an opportunity, how could you defend the teachers national wide handling the subject in relation to its poor performance?

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APPENDIX A

THE QUESTIONNAIRE FOR DATA COLLECTION PLEASE ANSWER THE QUESTION IN THIS QUESTIONNAIRE

INSTRUCTION:

i. Do not write your name on this questionnaire

ii. Answer the questions by ticking in the box provided.

iii. Give explanation in the spaces provided.

SECTION A : STUDENTS

1. How long is Maths lesson?

   1hr ☐ 2hrs ☐ 3hrs ☐

2. How many maths lesson do you have per day week

   1. ☐ 2. ☐ 3. ☐ 4. ☐

3. Is the number of hours enough?

   YES ☐ NO ☐

4. What do you think should be done to improve this subject

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5. Is there availability of maths textbooks in the Library:

   YES ☐ NO ☐

6. Do teachers have masterly of this subject?

   YES ☐ NO ☐

7. What is the general attitude of this subject from girls?

Negative ☐ Positive ☐

8. Why is this attitude so in reference to above

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9. How oftenly do you do exams/cats

Weekly ☐ Monthly ☐ Termly ☐

10. How often is feedback given?

Often ☐ Not often ☐

5. Do you initiate motivation to you Maths teachers?

YES ☐ NO ☐

6. How often do you take them for workshop and seminars?

OFTEN ☐ NOT OFTEN ☐

7. Have you looked at the syllabus contents of late?

YES ☐ NO ☐

8. Do you think the time allocated for maths lessons is enough?

YES ☐ NO ☐

9. If no how much hours do you think should be added?

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10. What do you think should be done to address this problem?

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THE QUESTIONNAIRE FOR DATA COLLECTION

PLEASE ANSWE THE QUESTIONS IN THIS QUESTIONNAIRE

SECTION B: TEACHERS

INSTRUCTIONS:

i. Do not write your name on this questionnaire.

ii. Answer the questions by ticking in the box provided.

iii. Give explanation in the spaces provided.

1. What is the student response when teaching mathematics subject?

   Positive ☐ Negative ☐

2. In response to the above what is your opinion on the issue?

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3. What is the syllabus workload on the subject?

   Small ☐ Big ☐ Excess ☐ Overload ☐

4. As the subject leader what is your view over the time allocated?

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5. How often do you give cats/exams?

   Weekly ☐ Monthly ☐ Termly ☐