FACTORS CONTRIBUTING TO THE POPULARITY OF MATHEMATICS OLYMPIADS AND COMPETITIONS IN SOME SCHOOLS: AN INTERROGATION OF LEARNERS' AND TEACHERS' VIEWS.

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Problem-solving is one of the features that makes mathematics an important subject in South Africa and other countries. Although the new NCS R-12 emphasises the need for problem-solving in the classroom, it would appear that teachers are not doing enough in this part of the mathematics curriculum. The writer has found that some affluent schools tend to provide problem-solving opportunities for their top learners by encouraging them to participate in Mathematics Olympiads and competitions. The data emerging from this study suggests that there are certain factors which contribute to the popularity of Mathematics Olympiads and competitions in some schools. These factors include the role of the teacher, learning culture of the school, performance in school mathematics, participation in team events and the role of the parent.

INTRODUCTION

Mathematics is a key subject in South Africa and other countries. In the National Curriculum Statement (NCS R - 12) document, commonly known as the CAPS document, mathematics is described as follows:

> Mathematics is a language that makes use of symbols and notations for describing numerical, geometric and graphical relationships. It is a human activity that involves observing, representing and investigating patterns and qualitative relationships in physical and social phenomena and between mathematical objects themselves. It helps to develop mental processes that enhance logical and critical thinking, accuracy and problem-solving that will contribute in decision- making. Mathematics problem-solving enables us to understand the world (physical, social and economic) around us, and most of all, to think creatively. (DBE, 2011)

This description of Mathematics is very inclusive and highlights important mathematical content areas such as numbers, geometry, graphs and patterns. It also highlights important mathematical skills such as observing, representing and investigating. Embedded in these content areas and skills is one of the cornerstones of the mathematics curriculum, that of problem-solving.

It is expected, as envisaged in the description above, that problem-solving should be a key feature of mathematics teaching and learning. However, there tend to be challenges with regard to the promotion of real problem-solving in South African mathematics classrooms. There are general complaints by teachers that the South African mathematics curriculum is too full and there is very little or no time to pursue real problem-solving during mathematics lessons. The more affluent schools tend to overcome this challenge by enrolling their learners as participants in the various mathematics problem-solving competitions or Olympiads. I have been involved in initiatives to promote Mathematics Olympiads among the less affluent schools. Unfortunately, due to a myriad of factors, these initiatives have not had the desired effect.

There are various Mathematics Olympiads or competitions which target school learners. One of these is organised under the banner of the Govan Mbeki Mathematics Development Unit (GMMDU) located at the Nelson Mandela Metropolitan University (NMMU). It is stated in its website of the GMMDU that this competition mainly targets learners in the Eastern Cape and aims to "**improve the problem-solving skills** of learners". It also aims to **promote awareness of the importance of Mathematics and Applied Mathematics** in society. It emphasises the importance of the **problem-solving approach to mathematics as "central** to the modern way of teaching mathematics" GMMDU, 2014).

The South African Mathematics Olympiad (SAMO) is organised under the banner of the South African Mathematics Foundation (SAMF). It targets both junior high school learners (grades 8 & 9) and senior high school learners (grades 10 -12) (SAMO, 2014). In South Africa and other counties, Mathematics Olympiads are used to identify talented learners of Mathematics. In some instances, the focus is on discovering learners with specific aptitudes such as verbal or quantitative and developing their talent. (Assouline & Lupkowski-Shoplik, 2012)

STATEMENT OF THE PROBLEM

I have had many years of experience as an examiner or co-examiner of mathematics problem-solving competitions or Olympiads. I have found, from personal experience, that learners who are successful in these competitions are usually from the more affluent or advantaged schools. As stated earlier, previous initiatives to promote Mathematics Olympiads among disadvantaged schools have not been as successful as one would like it to be.

When I had to work with top Mathematics Olympiad learners in preparation for the South African Interprovincial Mathematics Olympiad (SAIPMO) in 2013, I used this opportunity to find out more from these learners and, thereafter their teachers about their involvement in Mathematics Olympiads. These learners were selected from a list of top learners, provided by the South African Mathematics Foundation (SAMF), in round 2 of the South African Mathematics Olympiad (SAMO). I felt that by interacting with these learners and teachers, I would probably find out more from them about their participation in Mathematics Olympiads. This could be used to promote Mathematics Olympiads at other schools.

RESEARCH QUESTION

In the light of the aforementioned discussions, I posed the following research question for this study:

What factors contribute to the popularity of Mathematics Olympiads in some schools?

To answer the research question the following subsidiary questions were formulated in the context of the research question:

- Is there a relationship between participation in Mathematics Olympiads and performance in school mathematics?
- What are some of the factors which impact positively on learner participation in Mathematics Olympiads?
- What role do teachers play in promoting Mathematics Olympiads amongst their learners?
- How do Mathematics Olympiad learners work in group questions in an interprovincial competition and what strategies are most successful?

SAMPLE

There were 22 learners and 5 teachers in this sample. The learner group consisted of both junior learners (grade 8 & 9) and senior learners (grades 10 – 12). The teachers were selected from the same schools as the learners. Both learners and teachers participated willingly in this research.

CONCEPTUAL FRAMEWORK

In South Africa, Mathematics Olympiads are an "add-on" for learners and teachers. Learners tend to work through Olympiad- type questions in their own time and their teachers may or may not give them support. However, these Olympiads tend to enrich the learners' mathematical knowledge. Schools may use Mathematics Olympiads and competitions to promote excellence in mathematics learning, develop and enhance self confidence in learners and also nurture creativity amongst the learners.

In this regard, the Enrichment Triad Model (ETM) may be an appropriate framework for this study (Renzulli, 1977). This model consists of three different kinds of interrelated forms of enrichment activities that are integrated as a complement to the regular curriculum.

Type I enrichment consists of general exploratory experiences that are designed to expose students to topics and areas of study not ordinarily covered in the regular curriculum. Type II enrichment consists of group training in thinking and feeling processes, learning-how-to-learn skills, research and reference skills, and written, oral, and visual communication skills. Type III enrichment consists of first-hand projects or investigations intended to solve real problems (Renzulli, 1999). For the purposes of this research, type I and type III enrichment may be relevant while type II would probably surface during the team paper of the SAIPMO.

RESEARCH METHODOLOGY

Hatch (2002) reports that for qualitative researchers the experiences of real people in real settings are the objects of study. This type of inquiry is concerned with understanding how individuals make sense of their everyday lives. Qualitative research also seeks to understand the world from the perspectives of those living in it. This was very relevant to this research where the focus was on Mathematics Olympiads and an attempt was made to understand Mathematics Olympiads from both the learners' and teachers' perspectives.

Both the learners and their teachers completed questionnaires which covered the issues outlined in the research questions and sub-questions. As this study was conducted during the South African Interprovincial Mathematics Olympiad (SAIPMO), the quantitative data in this study was the learners' individual and group marks in the SAIPMO.

THE LEARNER QUESTIONNAIRE

In order to get a deep understanding of learners' perspectives on their participation in Olympiads, the following information was sought in their questionnaires:

> Performance in school mathematics and possible reasons for such performance; experience in Mathematics Olympiads; reasons for participating in Mathematics Olympiads; mathematics role models; giving advice to others; and other comments: In order to cover issues which may not have come up in the previous categories, I left it open for learners to give other comments.

THE TEACHER QUESTIONNAIRE

The teachers in the sample were from the same schools as the learners selected for the SAIPMO. They had to provide the following information in their questionnaires:

> Involvement in Mathematics Olympiads over the years; the value of Mathematics Olympiads; the school's policy in respect of Mathematics Olympiads; training sessions for learners; parental involvement and support; advice to other schools on Olympiads and their participation in different Mathematics Olympiads/competitions.

THE SOUTH AFRICAN INTERPROVINCIAL MATHEMATICS OLYMPIAD (SAIPMO)

Teams from all over South Africa and Southern Africa participate in SAIPMO. I was called by a SAMF representative in July 2013 to enter two teams (one junior and one senior) in the SAIPMO of 2013. I was given a list of top learners in round two of the South African Mathematics Olympiad. I made my selection of the teams from the lists provided. The SAIPMO provided this research with two sets of important data; the first one being the preparation for the SAIPMO and the second was the performance of the two teams in SAIPMO.

THE DATA

The data from the questionnaires were analysed with a view to detecting trends and patterns of coherence. Where appropriate, some interesting individual comment(s) are also highlighted.

THE LEARNER QUESTIONNAIRE

Performance in mathematics

Both the junior and senior team members had done very well in school mathematics over the years. These learners were at the top in their mathematics classes and their marks in mathematics tended to be in excess of 95%. These learners were always working hard and striving for mathematics excellence. Most of them received awards for mathematics. They loved the subject and were always encouraged and supported by parents. They also had dedicated teachers.

Experience in taking part in Mathematics Olympiads

The next two tables show the earliest grades which these learners started participating in Mathematics Olympiad or Competitions.

Grade	Number of learners
3	4
4	2
5	0
7	3
9	1
12	1 (immigrant)
Total	11

Table 1: Senior team first grades of participation

Grade	Number of learners
3	5
4	3
5	0
7	1
8	2
Total	11

Table 2: Junior team first grades of participation

Of the 22 learners in the sample, 14 of them participated in Mathematics Olympiads or competitions for the first time in grade 3 or grade 4. Thus, the majority of these learners had a very early exposure to Olympiads or competitions.

Reasons for participating in Mathematics Olympiads

Both the senior team and junior teams gave the following reasons for liking Mathematics Olympiads:

- They enjoyed working with high level, challenging and interesting problems.
- It gave them an opportunity for achieving excellence and making it into further rounds of the Olympiads.
- By achieving well in the Olympiads, there was an opportunity of winning prizes.
- These learners liked mathematics and found Mathematics Olympiads enjoyable and entertaining. For them it was a "good" challenge.
- Olympiads helped develop their problem-solving skills and expand their mathematical knowledge.
- Their participation in Olympiads enhanced their CVs (senior team only).

Mathematics role models

Four of the senior team members listed their mathematics teachers as role models. These role models inspired them to do well in mathematics. An interesting choice of one learner was "himself" stating that he did not have any role models and that he always challenged himself to do well in Olympiads. Only one senior learner chose a parent as a role model.

One learner claimed to have been inspired by "past students who have excelled in Olympiads". This tied in with the choice of another learner who was very specific about his role models. He chose Bruce Merry and Liam Baker. I did internet searches on both these men. Bruce Merry is a Computer Science specialist from the University of Cape Town and has received gold, silver and bronze medals in the International Olympiad on Informatics in the years 1996 -2001 (Merry, 2014). Liam Baker became the first South African to have a problem proposal selected for inclusion in the International Mathematics Olympiad (IMO), when his functional equation was one of six used at the 2012 edition of the competition for the sharpest high-school mathematics brains in the world (University of Cape Town Centre for Higher Education Development, 2014).

One could see why these choices were made. This learner, who was in grade 12 at the time, participated in International Olympiads in Mathematics and Informatics and received South African colours. Clearly, the feats of Bruce Merry and Liam Baker left an indelible mark on this learner. An interesting choice by another learner with surname Newton was Isaac Newton. This learner said: His work inspires me to continue the family tradition.

Seven of the junior team members cited one or both parents as being their mathematics role models who inspired them to participate and do well in Mathematics Olympiads. The majority of these (five) chose the mother. Other choices were teacher (chosen by two), uncle and brother. It is evident here that the mothers played a very important role in these younger (grade 8 or 9) learner's lives. As is evident from the senior team's responses, this may change as they got older.

Giving advice to other children

It would appear from the responses of both the senior and junior teams that they were keen for other children to have similar experiences when it came to participation and success in Mathematics Olympiads. This is very encouraging and could provide a platform for schools to introduce Mathematics Olympiads or competitions to their learners. In this regard members of the senior team gave the following advice:

- Children should prepare well and not be put off or give up.
- They should test their ability and add to what they learn in class.
- They should challenge themselves and enjoy the opportunity.
- Children should learn to think "outside the box".
- They should think carefully and look for different ways of solving problems.

The junior team suggested the following:

- Children should try their best and never give up.
- They should give themselves much needed practice by working through a number of different types of examples.
- They should use different problem-solving methods.
- Children should not spend too much time on one problem.
- They should always be striving for a higher level in mathematics.

Other comments

Both the senior and junior teams commented that Mathematics was an important school subject but school mathematics did not give learners adequate opportunity to develop their problem-solving skills. Thus, learners should be given the opportunity of participating in Mathematics Olympiads. This would enable learners to use important skills such creativity and insight, when working through Olympiad type problems. However, as this was an on-going process, they cautioned that learners participating in Olympiads for the first time should be realistic about their expectations.

THE TEACHER QUESTIONNAIRE

For purposes of data analysis, the five schools in question were called A, B, C, D and E.

The number of years the school has been involved in Mathematics Olympiads

Schools which encourage learners to participate in Mathematics Olympiads usually have a long and proud tradition of participation. The inclusion of this question in the teacher questionnaire was to check whether this was true for these schools.

School	Number of years
A	34
B	15
C	25
D	1
E	10

Table 3: Years of participation in Mathematics Olympiads

Four of the five schools had a long participation in Olympiads, ranging from 10 to 34 years, confirming my assertion in the previous paragraph. Only school D had participated for one year.

The value of Mathematics Olympiads

All teachers in the sample were very aware of the value of Mathematics Olympiads for their learners. In this regard, they provided the following reasons as to why participation in Mathematics Olympiads was important:

- It provided learners an opportunity to improve their problem-solving skills by encouraging deep, lateral, independent and creative thinking.
- It allows learners to enjoy and engage with mathematics in a different context. Gifted and talented learners are exposed to challenging problems and given the opportunity to excel.
- During practice sessions, usually without teachers, learners are able to discuss different problem-solving strategies and to “think outside the box.”
- It helps learners become confident and develop inquiring minds.

The school's policy in respect of Mathematics Olympiads

None of the schools in question had any specific policy with respect to participation in Mathematics Olympiads. At each school, there is a teacher in charge and everything is left to the teacher. Sometimes, student teachers are roped in to help. At some schools, the Olympiad dates are put on the school year plan and important dates are passed onto learners. Although all mathematics learners are encouraged to participate in the Olympiads, usually only the top learners do so.

Training sessions for learners

The teachers reported that no specific training sessions are arranged for their learners in respect of Mathematics Olympiads. Their learners work on their own as teachers are very busy with full teaching loads. Teachers may download past papers which are then passed on to the learners. Sometimes, learners may approach their teachers for support.

Parental involvement and support

Teachers stated that parents were very positive about their children taking part in Mathematics Olympiads and competitions. They are always very willing to provide transport. They welcomed opportunities for their children to participate in competitions in a social setting where group-work or working in pairs is encouraged. Some parents also tend to encourage their children to be competitive and aim to win prizes that may be on offer. The teachers also reported that parents do not expect them to provide training or tutorial sessions.

Advice to other schools on Mathematics Olympiads

To promote problem-solving amongst learners, teachers should incorporate problem-solving activities in their teaching. This is a gradual but important process. After learners are sufficiently accustomed to problem-solving, teachers should enter a few learners in low key events. In this regard, the inter-school mathematics relay, organised by school. Teachers in the sample were full of praise for this inter-school mathematics relay, stating that the relay was fun and competitive.

According to one teacher:

> Most maths teachers at government schools do not feel very confident about helping pupils with Olympiads at senior level and do not have the time to spend preparing sufficiently to help their pupils.

The participation of learners in team events would be less daunting for them. This would increase motivation and emphasise the need for collaborations amongst learners.

Participation in various Mathematics Olympiads and Competitions

All schools participated in the South African Mathematics Olympiad (SAMO) which has a junior section (grades 8 & 9) and senior section (grades 10 – 12). SAMO takes place over three rounds. In addition to this Olympiad, schools A, B and C participated in the NMMU/AMESA Mxit Mathematics Competition for junior learners (grade 8 & 9) and senior learners (grade 10 & 11). This competition also took place over three rounds.

Schools A and E also took part in the University of Cape Town (UCT) Mathematics Olympiad (grades 8 -12) and the University of Pretoria Mathematics Olympiad (grade 8-11). Another competition was the Young Mathematicians convention, organised by the International Montessori School for grades (10 – 12). School A participated in this competition.

As stated earlier, school A had a long tradition of participation in Mathematics Olympiads and other competitions. This school had a very dedicated mathematics teacher who also organised the inter-school mathematics relay.

PARTICIPATION IN THE SAIPMO

The first part of SAIPMO, which lasted an hour, consisted of Olympiad questions which learners had to answer as individuals. There were 15 questions in this part of SAIPMO. Thereafter, learners had a 30 minute break. During this time, learners had some refreshments and then both senior and junior team members started discussing strategy for the team paper.

The team paper consisted of 10 questions, each question carrying 100 marks. In this part of SAIPMO teams had to give only one set of responses. There were very intense and deliberate discussions among both groups of learners. To capture the marks scored by learners in the individual part of SAIPMO, the members of the teams were named as J1 (junior team member 1); J2 (junior team member 2); S1 (senior team member 1) and so on.

Tables 4 and 5 show the individual marks for the SAIPMO.

Team member	Marks obtained
J1	66
J2	76
J3	76
J4	68
J5	78
J6	51
J7	42
J8	56
J9	44
J10	39
TOTAL	**596**

Table 4: Junior team individual marks

Team member	Marks obtained
S1	100
S2	62
S3	31
S4	78
S5	52
S6	55
S7	62
S8	40
S9	85
S10	27
TOTAL	**592**

Table 5: Senior team individual marks

There were some notable performances in the individual rounds, especially for the senior team. In the team paper, the junior team scored 400 points while the senior team scored 700 points. The overall points for the junior team were: 596 + 400 = 996. The junior team was placed 19th out of 34 teams nationally. The overall points for the senior team were: 592 + 700 = 1292. The senior team was more impressive in that it was placed 3rd out of 34 teams. This is shown in table 6.

Team	Individual	Team	Total	Rank out of 34
Junior	596	400	996	19
Senior	592	700	1292	3

Table 6: Team scores and rank in SAIPMO

DISCUSSION

The learners and teachers participated in this research very enthusiastically and provided rich data. The learners were selected from very good schools and usually performed very well in their school mathematics, obtaining marks above 90%. These learners were looking for mathematics that challenged them; hence, their participation in Mathematics Olympiads and competitions.

They liked taking part in Mathematics Olympiads as this tended to build on their problem-solving skills. Most of the learners were frequent participants in Mathematics Olympiads. The junior learners tended to regard a parent (especially a mother) as an inspiring role model while the senior learners' choices were more diverse. All learners had clearly enjoyed participating in Mathematics Olympiads and wanted learners from other schools to benefit from this experience. They felt that these learners would also develop their problem-solving skills and creativity.

The teachers were very aware of the importance of Mathematics Olympiads and its role in the mathematical development of learners. Most of the schools had more than 10 years of participation in Mathematics Olympiads and competitions. However, there was no specific school policy on Mathematics Olympiads. Teachers usually played a coordinating role and provided learners with the dates and other such information. Due to the heavy work-loads of the teachers, none of them were able to have formal training sessions for their learners. One teacher, however, stated that learners were able to ask her for assistance when needed.

The schools participated in a number of Mathematics Olympiads and Competitions. This included the inter-school relay competition which was organised by school A. These teachers believed that other schools should also encourage their learners to participate in Mathematics Olympiads and competitions. A group competition such as the Inter-school relay would be an ideal vehicle to ease learners into such participation.

At the various schools, Mathematics Olympiads are regarded as an "add-on" and a way of enriching the mathematics of the learners involved. Thus, schools encourage their learners to participate in a variety of Mathematics Olympiads and competitions. Many of these have prizes or certificates as incentives and serve as a motivation for learners at these schools.

From an interrogation of the data and the discussion in this section, I would now like to outline my findings from this research. This is done in conjunction with my research sub-questions and research question posed earlier in this paper.

THE RESEARCH SUB-QUESTIONS

Is there a relationship between participation in Mathematics Olympiads and performance in school mathematics?

The learners in this research had done very well in round 1 and round 2 of the SAMO. These learners were selected to participate in the SAIPMO, based on their results in round 2 of the SAMO. These learners were the top performers both in the city and in the province. These learners revealed to me in their questionnaires that they performed very well in their school mathematics, getting marks in the region of 95% plus. Thus, it would appear from this sample of learners that, there is a strong relationship between participation in Mathematics Olympiad and performance in school mathematics.

What are some of the factors which impact positively on learner participation in Mathematics Olympiads?

The learners in this research were top Olympiad learners who have mostly been involved in Olympiads and competitions for a number of years. They were located in schools which had a long participation in these Olympiads and competitions. They had teachers who provided them with information and regular updates on Mathematics Olympiads and competitions. They had very supportive parents who probably encouraged them and transported them to Olympiad venues, when necessary. In this regard these factors may be summarised as follows:

Top performance in school mathematics; length of exposure to Mathematics Olympiads and competitions; previous success in Mathematics Olympiads and competitions and supportive teachers and parents

What role do teachers play in promoting Mathematics Olympiads amongst their learners?

It would appear that the teachers in this small sample were very modest about their role in promoting Mathematics Olympiads among their learners. In fact, I believe that they tended to downplay their roles. They pointed out that they would share dates with learners and ensure that Olympiads were included in the school year programme or plan. I venture to say that if these teachers did not do this, then their learners would not be participating in Olympiads. The inclusion of Olympiads in the school year programme ensured that Olympiads were regarded as an integral part of the school programme (as an enrichment activity).

I would also say that despite having full teaching loads, these teachers would be regarded as great "ambassadors" for Mathematics Olympiads at their schools. They ensure that their learners in their schools are given exposure to many Olympiads and this has probably resulted in an "Olympiad" culture at their schools. In many instances, these teachers play a lone hand in promoting Mathematics Olympiads at their schools.

How do Mathematics Olympiad learners work in group questions in an interprovincial competition?

The junior and senior teams had similar performances in the individual paper but in the team paper, the teams used different strategies. The senior team worked in pairs. Each pair worked through two questions and then submitted their answers to the team captain. The team captain had the final say on the submission of the answers. The junior team worked as individuals and then submitted their answers to the team captain. This strategy appeared to be more cumbersome and the selection of the final answers did not go very well.

It would seem that learners who participate in Mathematics Olympiads are very good at working on their own. However, when working in a team, team strategy and tactics must be discussed and spelt out clearly. In this research, while both junior and senior teams had similar performances in the individual questions, it would appear that the senior team strategy worked better during the team questions. The senior team had 7 out of 10 questions correct.

One area where team strategy could be developed is during Mathematics relays. The teachers in the sample were avid supporters of the inter-school relay for Mathematics, organised by school A. They claimed this relay, organised at both junior and senior levels, would be an ideal vehicle to expose schools to Mathematics competitions. In addition, learners work with mathematics in a social setting and have an opportunity of developing team strategy and tactics.

What factors contribute to the popularity of Mathematics Olympiads and competitions in some schools?

After analysing my findings in terms of my research sub-questions, it is now possible to answer the research question. In this regard the data collected in this study, and an interrogation thereof, points to the following factors which contribute to the popularity of Mathematics Olympiads and competitions in some schools.

The role of the teacher cannot be underestimated:

In this research, the data pointed to a single teacher being the driving force behind Mathematics Olympiads at each of the schools in question. These teachers usually work alone and are instrumental in informing learners about dates and placing the Olympiad in their school's year programme. These duties are carried out despite having full teaching loads.

The learning culture of the school:

It is evident from this research that conditions should exist within a school to make participation in a Mathematics Olympiad or Competition mandatory for top learners and others who are interested. Four of the five schools had 10 or more years of participation in Mathematics Olympiads. Thus, Mathematics Olympiads have become an integral part of the learning culture of these schools. In other words, it has become a "normal" activity.

The performance of learners in their school mathematics:

In this research, the learners were usually at the top of their classes. However, these learners were looking for challenges and this was provided by the Mathematics Olympiads. After having participated in Olympiads for many years, these learners saw the value of such participation and its influence on their own mathematics development. On this issue, I would say that it is imperative for all schools to encourage their top learners to participate in Olympiads and competitions. This will contribute to the all-round development of their top mathematics learners. This could also serve as a motivation for other learners to improve their school mathematics performance so as to be considered as a prospective participant in Mathematics Olympiads. However, the first rounds of many Mathematics Olympiads or competitions tend to focus on mass participation. In this case, schools should enter both their top learners and other learners who are interested. It is possible that this may unearth learners who may not be performing well in their mathematics but are good at problem-solving and thinking "out of the box".

Participation in team events:

This research showed that although there were similar individual performances for both the junior and senior team in the SAIPMO there were considerable differences in their team strategy. This resulted in different team performances. Teachers were full of praise for the Mathematics Inter-school relay competition held by school A. They believed that this would be less daunting and less intimidating for first time participants. At the same time, participation and success in the relays has the potential to make learners more confident about Mathematics competitions, in general. This could lead to increased participation in Mathematics Olympiads and competitions for individuals.

The involvement of parents:

Teachers reported that parents are very supportive of their efforts to promote Mathematics Olympiads at their schools. I have also noticed this first hand. During the training sessions for the SAIPMO and the SAIPMO, itself, the majority of the learners were transported to the venue by their parents. Some parents also called me to inquire about the results of their children and the overall performance of the teams. I have also attended Olympiad prize-giving events where parents tend to support their children in large numbers.

CONCLUSION

This research involving top Mathematics Olympiad learners and their teachers provided me with some rich data. Although the sample was small, certain factors were identified as contributing to the popularity of Mathematics Olympiads at these schools. These factors could be used by various stakeholders such as the Education Department, AMESA, SAMF and other organisations involved in Mathematics Olympiads and competitions to try to make these Olympiads and competitions accessible to more learners.

Popularising participation in Mathematics Olympiads and competitions is unlikely to be easy or quick. As seen in this research, it takes years of participation, a conducive learning environment, willing learners and dedicated teachers to ensure that curriculum enrichment programmes such as Mathematics Olympiads and competitions are implemented at more schools in South Africa.

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