Relevance of School-Based Mentorship and Support on Mathematics Teachers' Competences in Tanzania: Stakeholders' Perspectives

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Abstract: Teacher mentorship has been increasingly gaining popularity in recent years among experts in the field of education. This study examined the relevance of school-based mentorship and support on Mathematics teachers' competence in nine regions in Tanzania. A total of 700 (46 per cent, female) educational stakeholders - mathematics teachers and tutors, secondary school students, and other educational leaders participated in the study. The findings indicated that over time, stakeholders' understanding of mentorship and support was improved. This was realised during the midterm review when they started indicating a specific but broader conceptualisation of mentorship as an ongoing practice that can be done virtually or in person, between a knowledgeable teacher and a novice one. Furthermore, the findings highlighted that teacher mentorship and support improved their knowledge and skills, promoted teachers' attitudes towards mathematics and improved students' performance in Mathematics. The findings call for improved school-based mentorship and support practices to improve teacher practices and promote students' performance.

Keywords: Competences, mathematics teachers, mentorship and support, school-based.

1. INTRODUCTION

Recently, the demand for teacher professional development programmes, such as mentorship and support, has increased globally due to several challenges that teachers encounter in their careers. Challenges such as an unfavourable environment for the teaching and learning of Mathematics [1], shortage of well-qualified Mathematics teachers and shortage of teaching and learning resources [2] have been singled out as among the major challenges that affect the teaching and learning of Mathematics. Such challenges adversely affect effective teaching and learning of mathematics, henceforth, leading to students' poor performance in mathematics. According to the Basic Educational Statistics in Tanzania [3], students' average performance in the Certificate of Secondary Education

Examinations (CSEE) has remained below 20% for several years, with an average pass rate of 23% and 15% for boys and girls respectively. The literature acknowledges the place of teacher mentorship and support in addressing the challenges teachers encounter in their professional careers. Mentorship helps to improve teachers' professional development in terms of theoretical, pedagogical and professional growth [4], and more specifically, it improves teachers' knowledge, skills and attitude competencies while also enabling teachers to undergo professional development in their career path [5].

Nonetheless, despite the acknowledgement of the potential of teacher mentorship support programmes, only a small number of Mathematics teachers are engaged in such programmes [6]. In South Africa, [7] conducted a study to evaluate a Mathematics professional programme initiative, which included mentoring as an intervention implemented in a rural mining district in South Africa. The programme sought to address gaps relating to the teachers' instructional skills and some of the Mathematics content knowledge that was required. The findings of their study revealed that mentoring that takes into consideration teachers' content and instructional needs enhanced their lesson preparation and understanding of Mathematics, as well as the skills required to teach it effectively. As a result, the authors recommend that mentoring is an effective intervention in professional development programmes especially when it is informed by the teachers' instructional and content needs.

The challenges encountered in teaching and learning Mathematics in schools and the poor performance of students in Mathematics subject appeal to stakeholders' initiatives to address them. In Tanzania in particular, since the national independence in 1961, both governmental and non-governmental organisations have come up with teacher mentorship and support programmes, to improve Mathematics teaching and learning, with the core aim of improving students' performance in Mathematics during the National examinations. In 1966 the Mathematics Association of Tanzania (MAT) was officially given registration by then Ministry of Home Affairs to achieve the stated purpose of (i) effecting improvements in the teaching of Mathematics and its applications; (ii) uniting members and providing means of communication for this purpose; and (iii) educating the society on the importance of Mathematics and its applications [8]. The MAT's main roles among others include (i) conducting regional seminars and at least one national Mathematics seminar yearly, (ii) writing Mathematics books, and organising research competitions; (iii) organising Mathematics contests; (iv) conducting Pi day celebrations on 14th March yearly. Since its establishment, MAT has been on the frontline, particularly in organising Mathematics seminars and workshops for both in-service teachers and pre-service teachers [8].

In 2014 Education Quality Improvement Programme in Tanzania (EQUIP-T), a four-year government programme, funded by the UK Department for International Development (DFID) was initiated to increase the quality of primary education and improve pupil learning outcomes, in particular for girls in the most educationally disadvantaged regions. The EQUIP-T programme objectives included: (i) enhancing the professional capacity and performance of teachers; (ii) enhancing school leadership and management skills; (iii) strengthening systems that support the district and regional management of education; (iv) strengthening community participation and demand for accountability; and (v) strengthening learning and dissemination of results [9]. The EQUIP-T programme covered seven regions intending to improve education quality, particularly for girls in the selected regions. The quantitative and qualitative baseline study was conducted to determine the general teaching and learning status among primary school students in Kiswahili and Mathematics subjects. Among others, the results revealed that most standard three pupils fell considerably behind curriculum expectations in both Kiswahili and Mathematics subjects.

Despite the existence of these mentorship and support programmes, it has, however, been noted that many of these are not school-based. Thus, a school-based in-service teacher (SITT) mentorship and support programme was deemed important to allow teachers to attend continuous professional development at school. In 2016, the Teachers Union (TTU) and HELVETAS Swiss Inter-cooperation (HSI), through School-based In-service Teacher Training, introduced the SITT approach to address the challenges associated with students' poor performance in English language, Science and Mathematics subjects among primary schools in Tanzania -HELVETAS Swiss Inter cooperation & Tanzania Teachers Union [10]. The approach involved teacher education tutors who train and mentor primary school teachers, emphasising peer learning, team teaching, pupils' participation, practice-based learning, inclusiveness, model lessons, use of local materials as teaching aids, and health and environment. The evaluation of the SITT approach in 2022 revealed the improvement of pupils' performance in the National examination by 30% while on the other hand reducing the failure rate among project schools by 10% [11]. To make use of what worked in

primary schools, the SITT approach was scaled to the secondary education level through the programme known as Strengthening In-service Teacher Mentorship and Support (SITMS).

The project aimed at providing mentorship and support among secondary school Mathematics teachers through the SITT approach. The secondary SITT approach is implemented in three countries namely; Tanzania, Kenya and Zambia. The projects involved nine regions that included tutors from selected 21 teachers colleges (TC), who act as mentors for Mathematics teachers of the selected 105 secondary schools across the three countries. Prior to the implementation of the secondary SITT approach, the TC tutors who specialise in Mathematics were trained on how to employ the SITT approach in teaching different Mathematics topics. After being trained on how to employ the SITT approach, the TC tutors became mentors by providing mentorship and support to selected project schools. These efforts make it important to continue exploring the relevance of mentorship and support to Mathematics teachers.

Problem statement and Study objectives

Having taken a lot of initiatives including scaling up the SITT approach to the secondary school level, little is known about the relevance of such school-based mentorship and support on Mathematics teachers' competence. Thus, there is a need to establish the relevance of the SITT approach from the stakeholders' perspectives following the piloting at the secondary level. This need to establish the relevance of school-based mentorship and support on Mathematics competence forms the study objective. Specifically, this study intended to: (i) explore how stakeholders perceive mentorship as a means for supporting Mathematics teachers' competences, and (ii) examine the relevance of school-based teacher mentorship and support towards enhancing Mathematics teachers' competences.

2. LITERATURE REVIEW

Conceptualising mentorship and support

Mentoring and support are an ongoing process that helps mentees develop skills relevant to their life-long goals. Shared characteristics of mentoring relationships include that they occur between one or more mentors and one or more mentees, with some power or structural difference between the mentor(s) and mentee(s), they extend over some time, and the mentee (also a mentor) is in a position to learn and benefit from the relationship [12]. It involves a transformative process [13], whereby a more experienced professional in a particular field provides meaningful guidance and facilitates a novice professional's intellectual and career development [14]. Other scholars have attempted to advance the concept of mentorship by indicating various mentorship forms such as peer mentoring [15] and formal and informal mentoring [16]. Mentor or mentee relationships may be improved by matching mentors and mentees based on similar interests or demographics [17].

The quality of a mentor plays a crucial role in ensuring the effectiveness of mentorship and support. The qualities of a mentor among others include willingness to share knowledge, honesty, competence, willingness to let the mentor grow, willingness to give positive and critical feedback and direct in dealing with the mentee. Also, an effective mentor is expected to demonstrate respect, reliability, patience, trustworthiness, and the ability to listen and communicate effectively. On top of that, a mentor should be able to provide training, information about the organisation, as well as provide psychological support and increase the mentee's self-confidence by serving as a counsellor, friend, role model and coach [18].

Teacher mentorship has been increasingly gaining popularity in recent years among experts in the field of education, as a result of difficulties that hinder teachers' effectiveness in attaining the objectives of their lessons. Teacher mentoring and support have long been established to provide professional development to teachers [19]. Teacher mentorship refers to a professional development strategy in which a mentor assumes the supportive role of an inexperienced colleague [7], intending to nourish the teacher's classroom practices to the highest level [20]. It is a flexible process that, among other activities, involves classroom observations accompanied by meetings to reflect on the observations and assist the teacher in setting strategies for improvement where weaknesses are observed. The mentor can offer support for a much longer period to their mentees (teachers) to facilitate changes and engage in frequent mentoring sessions related to all aspects of teaching [21]. Providing mentoring has positive consequences for the career of the mentor in such a way that mentors are more likely to advance their competence through mentoring others.

Competence profile of Mathematics teachers

Mentoring as professional support aims at promoting specific teacher competences as such mentorship seeks to advance Mathematics teachers' core competences. There exist several frameworks for analysing Mathematics teacher competences. According to [22], competent Mathematics teachers need to demonstrate their competence in three domains namely knowledge, skills and attitude whereby in each of the three domains, a Mathematics teacher needs to master several competence elements as illustrated in Table 1. In particular, Mathematics teacher knowledge entails demonstrating competence in the subject matter comprising mastery of various Mathematics topics. In addition, teacher knowledge involves knowledge about mathematical content pedagogy knowledge – an essential dimension of the essential methods specific for facilitating Mathematics learning. Likewise, in [23] second model of teacher knowledge, several dimensions of knowledge are necessary for teachers: (i) content knowledge; (ii) general pedagogical knowledge; (iii) curriculum knowledge; (iv) pedagogical content knowledge; (v) knowledge of learners and their characteristics; (vi) knowledge of educational contexts; and (vii) knowledge of educational ends, purposes, and values.

The conceptualisation of Mathematics teacher competences was also guided by [24] framework for analysing teacher knowledge about Mathematics. The framework clusters Mathematics teacher competence into Mathematics knowledge about the essence of doing Mathematics; the practical competence of doing Mathematics; and the affective dimension of the worth of Mathematics [25],[24]. It follows that mentorship of teachers of Mathematics should focus on promoting not only content knowledge but also the practical part of doing Mathematics and the affective dimension of sensitising students on the essence of doing Mathematics and being a Mathematician. It is also important to acquaint Mathematics teachers with essential skills in preparing learning resources that promote the learning of Mathematics utilising locally available ones. Therefore, mentorship and support to Mathematics teachers are supposed to encompass various aspects integrating as summarised in Table 1.

Table 1. Mathematics Teachers' Generic and Specific Competences

Generic Competences	Specific Competence Elements
Mathematics Teacher Knowledge	a) Mathematical content knowledge b) Mathematical content pedagogy knowledge c) Knowledge of students' ability level d) Knowledge of teaching resources e) Knowledge of developing teaching and learning objectives
Mathematics Teacher Skills	a) Planning skills of preparation teaching b) Communication skills c) Classroom management skills d) Skills to diversify teaching strategies e) Skills to improve the level of professionalism f) Skills to assess students' learning skills g) Skills to assess students' engagement in the learning process
Mathematics Teacher Attitude	a) Flexibility b) Motivation c) Belief and trust d) Patience e) Curiosity f) Risk-taking

Source: Adopted and modified from [22]

Relevance of mentorship and support in enhancing Mathematics teachers' competence

As with any other teacher mentorship and support are critical to Mathematics teachers in improving their skill and knowledge on subject matter content competence and pedagogical competences. Mentorship and support to in-service teachers are relevant as the training in colleges and the time for training is short, mainly focusing on theoretical content rather than practical concerns. Several studies have demonstrated that teachers view in-service workshops as ineffective, preferring in-context support, which transforms their practices [26]. Furthermore, the study by [27] reveals that mentorship has the potential to close the gap between theory and practice when used as a pedagogic tool. Mentorship and support is also seen as a win-win practice for instance, a study by [28] shows that both mentors and mentees in Mathematics experience professional growth. Through mentorship, Mathematics teachers gain competency development. [29] in studying mentorship in science and Mathematics found that the majority of the sampled teachers learnt new teaching approaches and improved their content knowledge. In another study, it was found that the mentor teachers acknowledged that as they trained in mentorship and engaged in the supervision and guidance of student teachers, they were involved in continuous professional development that sharpened their instructional skills. Mentorship assisted Mathematics teachers to re-conceptualise and reflect on their instructional skills and critically evaluate their teaching strategies as they interacted with student teachers and experienced teachers [30]. Regarding relevant mentorship and support intervention, [26] found that it significantly improved novice Mathematics teachers' lesson analysis skills. This indicates the importance of mentorship as continuous professional development in a school setting. The evidence shows that mentorship and support have proved a success in different contexts, especially for teachers and schools.

Mentorship and Support framework for teachers

To understand better how to conceptualise mentor competence, it is essential to provide a distinction between mentoring competencies and competence as a mentor. Competence comprises a range of competencies or micro-skills and depends on the dynamic interplay of the various competencies [14]. In other words, competence means the sum of several distinct professional competencies and these specific skills, techniques, attitudes, and knowledge serve as mentoring competencies. A combination of knowledge, capabilities, and experience allows the individual to perform a task perfectly. Scholars such as [14] have proposed a three-sided model of mentor competence as a framework for conceptualising specific components of teacher competence in the mentor role.

The triangular model of mentor competence includes mentor character virtues, mentor abilities, as well as mentor competencies (specific knowledge and skills). Mentor character virtues include integrity, a caring heart, and prudence, whereas mentor abilities include intellectual abilities, emotional abilities, cognitive abilities, relational abilities, and communication skills. On the other hand, [14] viewed that mentor competencies include specific skills such as self-awareness, mentee development, understanding the relationship structure, and understanding the mentor functions. [14] further argued that when mentor teachers possess the necessary virtues of character and essential intellectual and emotional abilities, they likely have the capacity for competent mentoring. Figure 1 summarises the framework for conceptualising mentor competence.

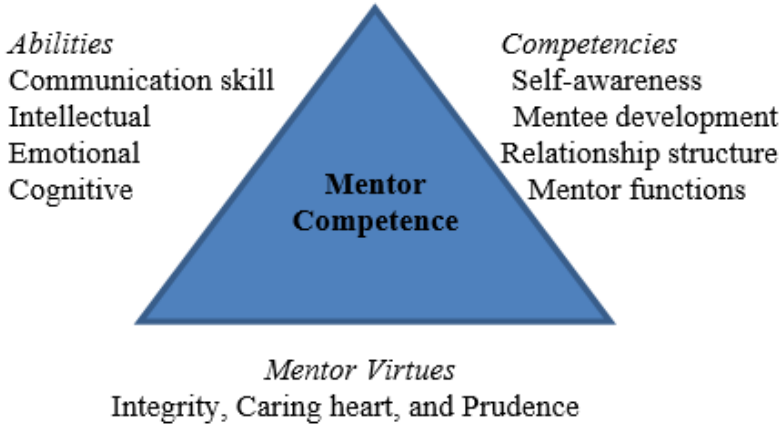

Fig. 1: The triangular framework of mentor competence as modified from [14]

3. METHODOLOGY

Participants

The study was conducted in nine regions in Tanzania (Kilimanjaro, Arusha, Dodoma, Morogoro, Mbeya, Shinyanga, Tabora, Iringa and Manyara) with the data collected at the district and school levels. As per the project framework that involved teacher colleges mentoring teachers, we sampled only regions with teacher colleges. A total of 60 schools participated in the baseline study. The selection of the districts emanated from, among other reasons, the existence of the primary SITT model colleges in these regions. It was also important to have as many representations of districts from the Tanzania geographical zones, particularly the Southern Highlands, the Central, the Northern, and the Coastal zones. A total of 700 (46 per cent, female) educational stakeholders participated in the study (see Table 2).

Table 2: Study participants

A. Focus Group Discussion (FGDs)	Male/Boys	Female/Girls	Total
1. Secondary school Mathematics teachers	14	7 (33%)	21
2. College Tutors	1	6 (29%)	21
3. Secondary school students	246	250 (50%)	496
4. Primary school teachers	2	4 (67%)	6
B. Individual Interviews			
1. Head of School	38	22 (37%)	60
2. TCs Principal	4	3 (43%)	7
3. District Education Officer	3	4 (57%)	7
4. District Quality Assurer	5	6 (55%)	11
5. Secondary Ward Education Coordinators (WECs)	25	10 (29%)	35
6. National CSOs/NGOs	3	2 (40%)	5
7. Local CSOs/NGOs	2	3 (60%)	5
8. Mathematics" Teachers' Association	1	1 (50%)	2
C: Observations			
1 Secondary school teachers	14	5 (26%)	19
2. Primary school teachers	3	2 (40%)	5
Total	375	325 (46%)	700

Approach and design

The study adopted a qualitative approach. Qualitative data were collected through interviews with Mathematics teachers and other key informants such as District Education Officers (DEOs), teacher college tutors and Ward Education Officers (WEOs). The selection of the participants was purposive to enable the collection of rich and valid data during the project design and implementation. The qualitative approach was suitable for this study as it allows researchers to collect detailed information about stakeholders' perspectives [31]. The data were coded in SPSS and the qualitative data in MAXQDA (software for analysing qualitative data). Simple descriptive analysis and qualitative themes formed the basis of presenting the baseline study findings.

Instruments

Data collection for this study involved focus group discussions, interviews with key informants and classroom observations of Mathematics lessons. Focus group discussions (FGDs) were also conducted with key education stakeholders (students, Mathematics teachers, teacher college tutors and the Ward Education Officers (WEOs). The selection of the participants was purposive to enable the collection of rich and valid data during the project design and implementation. Interviews were conducted with Ministry of Education, Science and Technology (MoEST) officials, directorates and agencies handling teacher education, curriculum development, Community-Based Organisations and NGOs providing mentorship and support programmes at the school level, Mathematics Teachers Associations, Teacher College Principals, District Education Officers (DEOs) and school heads. Their involvement facilitated the identification of mentorship and support bottlenecks and offered relevant recommendations. It was also important to review government documents (policies, circulars and reports) to map mentorship and support initiatives in Tanzania. As part of the literature review, several documents were reviewed, to mention important ones included: Basic Education Statistics in Tanzania [32], Education and Training Policy [33]; Tanzania Vision, 2020-2025; Draft Education Sector Development Plan 2016/17 - 2020/21; Mathematics Secondary Education Curriculum and Syllabus, Tanzania Institute of Education (TIE), 2016 and National Framework for Teachers Continuous Professional Development[34].

4. FINDINGS

The study aimed to explore how stakeholders (teachers themselves, students, HoS and the Local Government Authorities (LGAs) such as Quality Assurers (QA), Ward Educational Officers (WEOs), and District Educational Officers (DEOs) perceive mentorship as a means for supporting Mathematics teachers' competences. It also aimed to establish the relevance of mentorship in enhancing teacher competencies, particularly their knowledge, skills and attitudes towards teaching and learning Mathematics subject. The study also establishes SITMS project mentorship and support aspects that were of greatest benefit to Mathematics teaching as explained by the education stakeholders. Each is further discussed, where relevant participants' voices are added to support the findings.

Perceptions of mentorship and support

During the baseline study, stakeholders including the teachers themselves had a general understanding that mentorship is like any other professional development programme that aims to help teachers build their teaching competence to support students' learning. In this regard, mentorship was perceived as providing guidance and directive to a new teacher, incubating the teacher through different activities. As an output, the new teacher demonstrates competencies regarding the new roles, formalities, procedures and how to execute the same along with performing the teaching roles. Prior to the project implementation, even school leaders did not see the difference between mentorship and other forms of in-service teacher training. So, they associated it with any training for the teacher as long as it provides them with skills needed for teaching. Meaning that the stakeholders could not develop effective mechanisms when they were not able to articulate the concept properly. For example, one participant saw" ""mentorship and support""" as internal seminars that help to build teaching capacities to teachers""". The understanding of this participant was confined to the provision of seminars which are not regular and perhaps relevant. Many other stakeholders realised that mentorship and support is training between an expert and a novice teacher in a certain area. The issue of having an expert teach a novice teacher was emphasised as outlined by some participants in the following quotes:

> *"In mentorship, you need to get somebody else experienced or you find you are all experienced but you try to share to improve teaching and learning. (FGDs, Mathematics teacher, School 4)"….."Performed by an experienced person to take up within the department or across the schools to support teachers (FGDs, Mathematics teacher, School 12)."*

In the course of time, stakeholders' understanding of mentorship and support was improved. This was realised during the midterm review when they started indicating a specific but broader conceptualisation of the mentorship. This knowledge shift was due to the improved mentoring practices between tutors and Mathematics teachers. Stakeholders perceived mentorship and support as an ongoing practice that can be done virtually or in person, between a knowledgeable teacher and a novice one. They also saw that mentorship as an important ingredient for sustaining and scaling up innovations embedded in professional development programmes because it involved follow-up of learning activities between a mentor and mentee, as commented by one stakeholder that "but SITMS has helped

us to see the importance of these practices and there is a big difference in practice before and during this project implementation… I think this project is well prepared and after implementation, you are making follow-up". This understanding indicated a shift in the conceptualisation of the mentorship concept and there will be an improvement in professional learning.

Relevance of the SITMS project in enhancing Mathematics teachers' competences

a) Enhanced teachers' knowledge and skills

Teachers acknowledged that the capacity building about SITT innovation helped them to develop more relevant teaching techniques that simplified teaching and learning. Educational leaders, such as Principals and educational officers shared similar views on the effectiveness of the capacity-building sessions with teachers. One principal commented: "they (teachers) have been empowered in various teaching methods and fabrication of teaching tools… how to collaborate with their fellows and how to use the project communication forum for increasing their knowledge..." (Interview_Principal 4). The WEO 6 exemplified that:

> *Mathematics teachers now say..., I have used such and such method(s) to engage slow learners…, some students are known to be slow learners and so through the project, teachers learned how to identify and engage them with others.*

The quotes suggest that teachers shifted their knowledge and skills in teaching as a result of engaging in the SITMS project. Furthermore, leaders observed that teaching inclusive classrooms, and the use of alternative punishment methods were some of the issues addressed as teachers were developing competences in classroom practices during the implementation of the project. This change was evident when teachers realized that there could be effective ways of teaching without using corporal punishment and they also learned soft skills on how to take all students on board during teaching, regardless of their variations in academic ability. Principal 4 said that as tutor mentors they asked teachers after some time if mathematics could be well taught without canning students to check if they changed their mindset. The principal indicated that teachers no longer believe in the use of punishment, they said: *"the use of the stick is no longer needed… they agree that they were used to this bad way of teaching without their knowledge" (Interview_Principal 4).*

By engaging in the SITMS, teachers were able to organize team teaching and peer learning lessons that boosted teachers' competence and improved students' attitudes towards Mathematics. Prior to the SITMS project, most Mathematics teachers tended to work in isolation, which exacerbated their challenges in teaching and some students hated the subject more. In the course of the project implementation, most of the teachers found that teaching was simplified when they worked as a team in preparation for teaching a specific lesson. The team teaching also aroused learners' interest as they saw it as a new experience that helped them to understand, as narrated:

> "*The project has improved teacher's working relationship…, through peer learning and team teaching… Mathematics is becoming easier and attractive to children…," (Interview_Principal 1).*

b) Enhanced teachers' attitude toward Mathematics

As they employed the SITT elements, teachers were using the environment to facilitate learning and to help students see the link between the subject with the real life. During the FGDs, teachers mentioned that they did not know if they could use the environment and the local teaching resources to improve teaching. With the SITMS project capacity-building endeavours, teachers changed their perception and are now using the environment as a teaching and learning resource. As further narrated:

> *"Through the training, we changed our mindset…, we started to use locally made teaching materials and the existing environment for teaching and learning, there are some topics that we used to teach without knowing that they can be improved by using teaching aids…," (FGD_Teachers_School 2).*

Students started to see that Mathematics subjects was interesting, making them see the relevance of attending schools, as commented by one student:. "Some approaches have changed; for example, today, our teacher taught us about coordinate plane, that plane we made ourselves…, and we understood better," (Students' FGD_School 1). Another head of school clarified how activity-based teaching in the project would make students develop a positive attitude towards Mathematics:

"Students have become active, and their faces show passion, happiness and interest. I have discovered that we used to teach in the classroom, but now we take students outside the classroom. So, they [students] enjoy the lessons being conducted outside the classroom. If we continue with these approaches, many students will like school, and even truancy will decrease..." (Interview_HoS_School 1).

Learners were engaged to a great extent in making real Mathematics models and teaching aids, something they had not done before. This change in practice goes with a change in mindset not only for students but also for teachers who held a view that Mathematics is not teachable for most students and does not have various teaching aids that could support understanding.

There has also been a perception among students that Mathematics subject is difficult across the communities so the application of a practical-based approach as practised under the SITMS project, is time-consuming. These perceptions have changed among students following the application of the SITMS project training by teachers. As narrated:

"Many of us before using practical-based learning as currently used by teachers, believed that Mathematics is a difficult subject…, our parents used to give us hope that we should keep studying it…, it is not difficult at all…, Now after using practical-based learning, we tell our parents that it is true as you told us that Mathematics is not difficult…," (Students' FGD_ School 1).

The SITMS project has also enabled teachers to create a friendly learning environment with their students. Before the project activities, corporal punishment was reported to be prevalent among Mathematics teachers, but the practice changed following the implementation of the SITMS project activities. As narrated:

"Punishment has decreased because when they [teachers] started to use practical-based learning, many students began to understand, and punishment has decreased…, previously as teachers teach…, students were not listening because there were no activities, so the teacher was upset..., because he was using much energy and students did not understand, but now students concentrate on activities and understand quickly, and teacher is motivated to teach…." (Students' FGD_School_2).

The perceived difficulty in learning and teaching Mathematics was also observed among education leaders. As narrated:

"The teaching techniques as applied under the SITMS project, make the subject easier and understandable..., the practice that was not done in most schools..., and even myself I had already despaired with the Mathematics but from what I have seen in this project I wish I could go back to school and learn Mathematics again. Now there are better ways and tools to teach Mathematics…" (Interview_QA 1).

c) Improved students' scores in Mathematics

Changes in the teaching approaches as well as positive attitudes towards Mathematics largely contributed to the improvement in Mathematics performance. Most of the students reported that apart from developing an interest in learning Mathematics, their monthly and terminal grades improved drastically. The following summary of responses from four different students who observed a shift in performance, since they started engaging in the SITMS innovation: They reported:

"To some extent, the performance has increased somehow..., for example, many of us scored low in the Mock examination but our performance improved in the pre-national exam. For example, I scored an F in the Mock exam and a C in the Pre-national exam..., I scored an F in the Mock exam and a D in the Pre-national exam..., I scored F in the Mock exam and a D in the Pre-national exam..., I scored a D in the Mock exam and a C in the Pre-national exam..., I scored F in the Mock exam and a C in the Pre-national exam..., I scored F in the Mock exam; I did not sit for pre-national but my performance has improved..., I scored F in the Mock exam and a D in the Pre-national exam...," (Students' FGD_ School 3).

The slight shift in the performance of students cannot be trivialized. This shift suggests the possibility of improving more if teachers should continue promoting innovation by effectively engaging students. Similar findings were also reported at the district level regarding improved performance, following the implementation of the SITMS project. One

of the DEOs reported: “it is still in the last position…, but there is some improvement because in the second quarter, the performance was 4 per cent, the third quarter the performance was 12 per cent...,” (Interview_DEO 5).

5. DISCUSSION

This study aimed to explore the stakeholders’ perception of mentorship as a tool for teacher professional development and to examine its relevance in improving the competences of Mathematics teachers. Findings show that many educational stakeholders agree that mentorship is a useful format for teacher professional development, whether formal or informal. However, before the project implementation, stakeholders revealed a narrow perception of the mentorship concept. Some stakeholders believed that mentorship involves experienced teachers guiding a new teacher on how to carry out his or her teaching. These perceptions do not differ from the arguments of many scholars in broad literature [14], [13]. Mentorship is globally known as an antidote to beginning teachers in their early career phase to strengthen them due to practice shock [35]. Other stakeholders felt mentors should often come from outside the school to make effective professional learning. Interestingly, mentors were considered givers of knowledge and skills, and the mutual benefit that develops between the two is not seen. In such a narrow perception, teachers cannot be attracted to engage in mentorship, as they will see nothing to benefit from it.

However, the contemporary literature emphasises educative mentorship, in which there is a mutual benefit between a mentor and a mentee. As commented [36] developments in education, “teachers are being educated throughout their careers” regardless of the experience they have obtained. In the broader sense, even experienced teachers help each other in case one lacks knowledge in a certain aspect. A broader conceptualisation of mentorship and support can help stakeholders such as educational local authorities appropriately advise on the establishment of relevant school-based teacher mentorship practices. As the project involved stakeholders such as tutors, teachers, and all educational leaders, the understanding of mentorship was wider and its implication was seen in supporting them to learn and teach well. Mentorship needs to be viewed in a new and promising direction from just being performed in pairs or groups for improving grades to becoming an integral part of professional cultures in schools and developing the ability to form strong horizontal relationships between teachers and educational leaders.

Many stakeholders perceived that teacher mentorship practices conducted between tutors and teachers in the SITMS project improved the teaching of Mathematics. In general, mentorship helped teachers to improve their teaching competences in terms of knowledge acquisition, development of skills and change of attitude in teaching. Teachers became creative in using the local environment to encourage students learning. Similarly, a study by [28] indicated that effective mentoring enabled Mathematics to improve their competence in teaching. Indeed, mentorship was found to have the potential to close the gap between theory and practice when used as a pedagogic tool [27]. In the same way, [29] found that most sampled teachers learned new teaching approaches and improved their content knowledge when engaged in the mentorship of Science and Mathematics teaching.

Of most importance, it was revealed that the SITT-based mentorship of teachers impacted students’ learning of Mathematics. Students demonstrated changes in their performance in Mathematics, and increased interest and participation in learning Mathematics. This is because tutors were empowered to take mentorship roles and teachers were keen to learn or share experiences [36]. Therefore, mentorship assisted Mathematics teachers in reflecting on their instructional skills and critically evaluating their teaching strategies as they interacted with new or experienced teachers [30]. Teachers’ competences were developed through ongoing mentorship from tutors and the community of learners created by themselves as they realised the project objectives. When tutors mentored Mathematics teachers, these teachers started mentoring their colleagues at the school. By doing so, the Mathematics teachers strengthened their teaching skills. If well organised, mentorship can strengthen professional learning communities in schools and guarantee teachers’ participation in meaningful continuous learning [37]. Mentorship and support have also proved a success in different contexts, especially for teachers and schools.

Generally, the stakeholders’ overall understanding of the concept of mentorship and support was improving according to how they were involved in the project and implemented it. When teachers and tutors participated in this systematic mentorship, they saw that mentorship is a broader concept that could help teachers participate in sustainable professional learning compared to one-shot seminars. Even school leaders developed broad ideas related to the concept of mentorship and support as they participated in the monitoring and evaluating of the mentoring activities. Importantly, all stakeholders were of the perception that mentorship and support through SITMS have been relevant

and meaningful in improving the competencies of Mathematics teachers in secondary schools. Knowledge of difficult topics, methods and attitude change were emphasised as major areas where teachers gained teaching competencies through mentorship. The most basic thing is to build the ability of teachers to continue mentoring their fellows in challenging areas.

With the perception that mentorship and support programmes have contributed significantly to the impact of teachers' competencies in teaching and students' academic achievement, a strategic plan needs to be developed to help teachers in schools engage in fruitful school-based mentorship and support programmes. The Ministry of Education and all educational managers should manage school-based professional development programmes that are implemented well by using expert teachers or tutors to empower other teachers at low or no cost. If mentorship and support practices are not linked to professional development programmes, it might be difficult for teachers to sustain education innovations or scale them up. Further research can be done to see how schools support mentorship practices such as by making time for teachers to interact, educate them and even monitor their implementation.

6. REFERENCES

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