Mathematics Teachers' Perspectives and Practices on Use of Small Group Activities at Secondary School Level in Tanzania

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Abstract

Informed by the social cultural theory, t*his qualitative study investigated mathematics teachers' perspectives and practices of group activities as a teaching strategy when teaching mathematics at ordinary secondary school level in Tanzania. Guided by the interpretivism paradigm the study aimed to collect data on teachers' perspectives and how they practice the use of group activities when teaching mathematics. The study involved four basic mathematics teachers who were purposively selected based on the criteria of being trained during their professional training and were teaching basic mathematics at ordinary secondary school level. Data was collected through non-participating classroom observation and teachers' self-reflection of their lessons. The findings from this study revealed that, the participant mathematics teachers' standpoint was that, the group strategy is appropriate for helping students to work together as it is required by official documents when employing learner-centred pedagogy. The form of group tasks that teachers assigned to students informed the study that, although teachers were trained to implement the use of learner-cented pedagogy, teachers had not well-developed competencies to effectively use group task as a learner-centred strategy. The participant mathematics teachers employed group tasks that did not meet criteria for mathematics group tasks. Furthermore, the teachers' planned group activities did no help teachers to meet teaching and learning goals such as improving students' acquisition of the required mathematics competencies. Teachers in the study employed the strategy as a routine and a mean to satisfy higher educational authorities. These findings implied that, the participant teachers in this study had limited professional skills to use group activity as a teaching strategy. Students' participations in the teachers' planned group activities informed the study that, the teacher had not helped students to effectively make use of the tasks as means of acquiring learning competencies in mathematics classrooms. It is therefore concluded that, the participants' teachers' perspective of group activities and practices inform teachers' decision to use, practices and implement the teaching strategies. It is recommended that, mathematics professional development programs are required to help mathematic teachers acquire necessary competencies in the use of group activities. Such professional development programmes will enhance teachers' effective use the strategy so as to improve students' learning and outcomes in mathematics.*

Key words: *Teachers, perspectives, practices, small group activities*

Introduction

Previous studies on group work as a strategy for teaching and learning process have indicated that, the model of learners interactions in group tasks have significant impacts on teaching and learning process (Laal & LaaL, 2012). The impact on learning is only achieved when teachers make proper choice of tasks, plan the tasks, make decisions on the use and provide required guidelines to learners. Empirical evidence has previously shown that effective group work share common characteristics and that group members are motivated by their shared goals, positive interactions and formalized leadership of the group (Davies, 2009). Members' group goals in group activities are facilitated by members' participation and engagement in the activities with a common aim of developing the expected competencies. Research findings in the area of mathematics teaching continue to provide evidence on the significant impact of group work to learners' learning.

Researchers have documented on the teachers and learners' experiences in the use of the strategy in different ways. Educators support the use of group work as a teaching strategy in classrooms by stressing that, group activities are among the effective ways to let the students get involved in the learning process Cohen (1986). There are evidences from the literature that indicate that teachers experience and perspectives on the group work as a strategy in teaching has resulted to a debate on effective of group work as a strategy in teaching and enhancing learners' competence in the subject matter. In Tanzania, the revised mathematics syllabus (2023) demand teachers' use of learner-centred approaches whereby group work is identified as an interactive teaching and learning strategies hence recommended when teaching mathematics in secondary school

classrooms. This study investigated mathematics teachers' perspectives and practices of group activities as a teaching strategy when teaching mathematics at ordinary secondary school level in Tanzania. The aim of this study was to collect data on the reason teachers choice of the use of the strategy and the way teachers implemented in mathematics classrooms

Literature review

Previous studies on small group instructions have resulted into mixture of teachers' perspectives and practice on the use of strategy. The studies such as that of Gerleman, (1987) have revealed disappointing results on the strategy in mathematics classrooms as it failed to give the expected potential benefits like that of whole class teaching. A number of other empirical evidence on grouping for instruction have provided evidence that a group activity in the classrooms as a teaching strategy help learners to understand the subject matter as they interact in a social unit. In the United States of America Good et, al (1990) examined a sample of 1504 teachers from 126 elementary schools in 10 districts in three states. The findings from this study reported that, teachers' concepts of group size ranged from half a class to a group of four students. Their findings on teachers' practices showed that, 13% of teachers used two or more groups when teaching and that while they worked with one group, students were assigned in groups to work alone. The number of students in the classes varied from state to state or district or district). Only 5% of the teachers reported using two or more groups in which students were encouraged to work cooperatively. In the study by Webb (1990) mathematics teachers engaged students in higher order thinking group activities and teachers were reported with understanding that group activities supplemented their teaching deficient because during group activities learners seated in informal ways of seating arrangement which was opportunities for learners to exchange ideas and acquire additional information from peers.

On the aspects of form of activities Price and Nelson (1999) distinguish between lessons and activities in two ways. Both lessons and activities require different planning decisions and usually lessons include various activities. The significant difference is based on the purposes, objectives and the type of evaluation needed. The purpose of the lesson may be to provide initial instruction on important skills or knowledge. Activities on the other hand may have varieties of purposes, for example, learners' motivation, additional experience, elaboration of information, additional practice, or integration or generalization of skills and knowledge. A lesson has a specific, measurable short-term objective, and that the teacher's intention is that each student will meet that objective by the end of the lesson. Activities are used along with lessons to help students make progress towards long-term objectives or goals. Lessons are followed by a formal evaluation while the evaluations used with activities are often less formal and less individual.

Cohen (1986) has referred group work to a small working group of learners designed in a way that everyone can participate on a task that has been clearly assigned. This concept mean that learners in a group work are expected to carry out their task without direct and immediate supervision from their teacher. Cohen (1986) categorized grouping strategies for instructions as group work and ability grouping. The ability grouping is used by teachers to divide up the classroom by academic criteria so that they can instruct a homogeneous group. This is possible when a class is a homogeneous group. This is normally not achieved as students in normal classes have individual differences that teachers are expected to manage. Teachers who overlook this aspect are faced with classroom management problems. The key features of group work according to Cohen (1986) are such that, teachers give students a group task and delegate authority by allowing learners to make mistakes and struggle on their own. In contrast to delegation, direct supervision is practiced whereby teachers tells students what task is to be done and how to do it. Teachers are so close and practice monitoring the students by preventing them

from making mistakes and correct errors right away. Since group work strategy is of emphasis in Tanzanian secondary schools, this study was designed to collect data on the teachers' perspectives and practice on the strategy. Understanding teachers' perspectives and practices informed the study on the teachers' practices as informed by their perspectives. Their perspectives and practices are beneficial to the effort to improve teaching and learning as demanded by the paradigm shift from the stress on the use of more teacher centred approaches to the use of more learner-centred approaches in the classrooms.

Methodology

In answering the research question this study was guided by the social cultural theory that in building understanding of the key participants in the phenomenon it is important to consider their psychological functions. The social cultural theory helped the to tap behaviors and perspectives of the participants which was the main issue of the study. The fact is that, small group activity as a strategy is employed in a social learning atmosphere where each participant is a member of such a learning community. During these social learning activities, the teachers' perspectives on their roles was captured as students were learning in such a collaborative atmosphere. The study employed a qualitative study approach underpinned by the interprevism philosophy to shed light on the teachers' perspectives and practices of group teaching strategies with a view that being key players in the use of group teaching strategies to teach mathematics subject at ordinary secondary school level, their experiences provided informed data to answer the research question.. The study involved four mathematics teachers identified as T1, T2, T3, and T4 who were purposively selected based on being teaching mathematics in four mathematics classrooms at ordinary secondary school level in Tanzania. The selection of teachers was based on the fact that, for more than five years these participant teachers had managed to record high performance status at school, district and national levels in Tanzania. The four teachers were professionally

trained, certified by their education authorities and had experience in teaching for at least five years.

Data was collected through non-participating classroom observation and teachers' self-reflection of their lessons. Analysis of data was done qualitatively beginning by reading through the data to understand the data before generation of themes that emerged during classroom observation s and teachers self-reflection. During data analysis, each participant teacher was treated as a case study and a unit of analysis. After individual case study analysis, cross case analysis was conducted to capture similarities and differences in the teachers' perspective and the practices in the use of group activities as strategies when teaching mathematics.

Results and discussions

Teachers' reasons and decision to use group work when teaching mathematics

The participant teachers' reason for group teaching strategy was mainly management of students discipline and raising motivation level of the students as explained by T2:"*I use group instruction to distribute tasks that are manageable. I have large class and students who are slow in learning. Grouping them is a method that assist me to teach different concepts at once. Not all topics are simple.* T4 added that, the reason for use of group tasks is diversity of students and purpose of the activity as stated *"Techniques likes groups help us to make it simple to our students when learning with others". "You accommodate diversity of needs, however it is always a challenge because not all students like mathematics. I am trying to help students to work together with others in groups". To let it go, the tasks that I think are appropriate to students are problem solving task and when students work together to apply what they have learned*. T1 had a view that: "*without addressing students' interest in the subject, group work may not help to achieve objectives. We do use group activities as suggested but it seem to be rarely understood by many of fellow teachers. Teachers rarely plan in their lessons, so when implementations do*

not produce what is intended, we use it to fulfill requirements of the syllabus" Another teacher T3 added:

> Administrators pressurize us to over the cover syllabuses. Using group work or groups' strategies may cause delay in covering the contents. This reason has caused teachers to use it when inspectors observe their classrooms in sessions when they teach". Go around different classes you note that, there will be students wondering around and are not parts of any group and are not engaged in their task. Some task are performed by very few students and others are working individually rather than being part of the group.

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These teachers' reasons for using the group work strategy is fact determined by their beliefs on its significant value on the strategy. Teachers' belief on its effect on students' learning influences the choice and use of the strategy. Teachers' satisfaction on the students' participation determine choice of the strategy as argued by the reviewed literature in this study such as Good et.al. (1990).

Mathematic teachers' preference of group work

With regard to teachers' like and competence to the use of strategy, participant teachers shared their views that not all teachers are interested with the strategy as explained by T3: I dislike the use of group activities to improve mathematics achievement. My students are not interested too and have tried to resolve, I think group work apply to students who are highly motivated with the mathematics.

Data from classroom observation and teachers' self-reflections informed the study that, the participant mathematics teachers preferred the use small group work at the end of the lesson with a reason that, learners are familiar with material for discussions. This is as affirmed by a response from a teacher T1 during self-reflection session: "*at the end of the period, I used group assignment. I know that, the students know what to discuss, they revise and learn more than*

when you start with groups. It is a wastage of time because when you have students failing to understand the concept how can you deal with such case in a limited time?" Another teacher T2 stated: *I personally had few activities at the introduction that did not require groups, you introduce, leave the students to learn more from you as you proceed in the end students do homework and it is a proper time to use groups. At the middle and sometime according to the need. However, I prefer doing at the end of my lesson. At the beginning I did a review in my lesson that required no group work.* A teacherT4 added*: I do use group discussion frequently and this happens like today when students have knowledge to share something I give group activity. It is optimal to provide group activities at the end of all class activities*. A teacher T3 added: *Five to ten minutes are reasonable for a group activity at the middle or the end of the lesson. I preferred this time because I expect to do assessment and evaluate learning. During this time students share ideas, learn more and add news as they discuss in groups.* The presentation in this section shows that, the participant teachers had a positive perceptions towards group activities. There were also views from the key participants that, group work in the classrooms are not always applicable and it is inappropriate to fast learners who are bored when the task is too easy. The benefits was not by participant teacher to be applicable to slow learners who would require more time and assistance from their teachers and their peers.

Another teacher explained that motivation is a key factor as stated:

> Group work is very necessary in mathematics teaching, however, the problem that face most of the teachers is the pressure to cover the syllabus. We normally run fast to make sure that the syllabus is over. Very often most of our students study in tuition classes. We find no reason to utilize this strategy several times. Although we understand that it can help, we feel that it bore most of the students. For this reason it is always hard to

prepare teaching material enough for them under such pressure taking into consideration that it takes time to teach a topic using this strategy.

Teachers' observation on students' motivation revealed life in the classroom situation and the challenges that they faced in implementations process. The nature of the topic, material required, purpose for grouping, students' ability and the amount of time that is needed in group work are key elements of teachers' perspectives on group work that this study revealed. Evidence from previous literature in favor of group activities has capitalized on reorganization of information to learners working together Webb (1991) and Kight (1993).

Conclusion and recommendations.

The findings from this study confirms that, teachers like to use group work for problem solving, motivating students, deal with students needs and have opportunity to exchange information. The teachers' perspectives on the use of group work is determined by the students' interest in the use of the strategy. The participant teachers'' intimate knowledge of the students proved to be the most useful information in forming groups. The participant teachers' perspectives informed the study that, they preferred the use of small group activities more during the middle or last part of the lessons than at the beginning. Study on teachers' perspectives on the efficiency of group activities for meeting needs of students who vary in ability might help to explain more about this approach for teaching mathematics. Since the participant teachers in this study had different perspectives on the use of group activities, there is a need to continue with the effort of putting more emphasis on professional development to teachers that are geared towards creating awareness to teachers on what is needed to improve their use of group activities and hence use the strategy to improve students' achievement in mathematics.

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