Teachers' And District Resource Teachers' Perceptions of Teaching Science in Multigrade Primary Schools in Lesotho

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Abstract: This qualitative study explored the pedagogical practices in multigrade science classrooms by examining the perceptions of ten purposively selected teachers and three district resource teachers. The aim was to document teachers' experiences and to determine whether their professional preparation adequately equips them for the demands of multigrade science instruction. Data were collected through classroom observations and interviews. The findings indicate that teachers' brief, week-long orientation on multigrade concepts was insufficient in tackling the inherent complexities of these classrooms. This limited preparation compromised effective teaching and meaningful learning, influencing decisions related to grade grouping configurations, lesson planning, and pedagogical methods. The study observed that science lessons were predominantly teacher-led, with minimal student participation in inquiry or knowledge discovery. Many teachers appeared to remain at a foundational "self-concern" stage, reflecting uncertainty and limited confidence in managing multigrade science instruction. Moreover, grade groupings often did not support thematic teaching, with science being taught through lectures rather than inquiry. Additionally, grade combinations often hindered thematic integration, reinforcing reliance on lecture-based instructions rather than inquiry-based approaches. Recognizing the vital role of multigrade education in rural areas, the study highlights the importance of strengthening teachers' professional development to better prepare and support them in implementing engaging, inquiry-based science instructional strategies.

Keywords: Multigrade Science Classrooms, Multigrade Teaching, Multilevel Teaching, Pedagogical Practices, Primary Science Teaching

1. Introduction

Multigrade teaching is common in both developed and undeveloped countries (Brown, 2010; Taole, 2022). This encompasses the sub-Saharan countries, including Lesotho, which mainly have low-density populations in their rural districts (Mulkeen & Higgins, 2009). Lesotho, as in the case of other developing countries, is dominated by rural communities, which are sparsely populated because of the topography of the areas.

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As a result, the remote rural schools have a very small number of learners per grade, which makes it difficult to provide teachers for every class. Therefore, 46.8% of all primary schools in Lesotho are practicing multigrade teaching (Lesotho Ministry of Education and Training [MOET], 2005), and as such, multigrade teaching is a teaching strategy borne of necessity (Kivunja, 2014; Mulkeen & Chen, 2008). Multigrade is defined as a situation where teachers are assigned to teach two or more grades during one time-tabled period or in the time that is available to teach one grade level (Khalid et al., 2024; Makoele & Malindi, 2014; Pridmore, 2007; Tredoux, 2024). Teaching in a multigrade context is considered complex or challenging for a teacher trained for monograde. This is attested by the study of Matobako and Hequa (2018), which revealed that teachers' struggle with multigrade teaching and its challenges in Lesotho. Hyry-Beihammer and Hascher (2015) argue that multigrade is a pedagogy of choice or necessity; it needs teachers who can manage and teach multigrade effectively. This study sets out to explore the perception of teachers and district resource teachers (DRTs) on pedagogical practices which are employed by multigrade teachers when teaching science, as well as the effectiveness of this practice.

2. Literature Review

Managing a multigrade classroom is difficult because there is more than one grade level in the classroom, along with different levels of abilities. Therefore, multigrade teachers need to be especially creative in the way that they group learners. This implies that teachers must be aware of different ways of grouping children, the importance of independent study areas where learners can go when they have finished their work, and approaches to record keeping which are more flexible than those prevalent in the monograde classroom. Teachers must be able to instill in their learners the value of independent learning and cooperation by involving them in classroom decision-making (Berry, 2006; Brown, 2010; United Nations Educational, Scientific and Cultural Organization [UNESCO], 2015). Table 1 shows how grades across Lesotho are combined in most primary schools.

Table 1: Common multigrade grade combinations in Lesotho

Multigrades		
Grades	Frequency	Percent
1,2	12	16.0
3,4	11	15.0
1,2,3	9	12.0
4,5,6	43	57.0
Total	75	100.0

What one can decipher from Table 1 is that the common combination of grades is that of combining grades that follow each other, such as grades 1 and 2, and that combining grades 4, 5, and 6 together has the highest percentage of 57%. This mode of combining grades was found to allow for spiraling of concepts and thus facilitates thematic teaching. The Lesotho national curriculum has been developed with a mono-grade teaching setting in mind; this implies that even the training the teachers receive is based on the operating curriculum. Combrinck (2011) and Cadosales (2017) posit that teachers trained in monograde

curricula struggle to adapt to multigrade curricula teaching. These teachers are expected to be able to shift from their normal planning for a monograde classroom *to* "*plan across grade level objectives, or to amend the curriculum to make it more suitable for their setting*" (Brown, 2010, p.54). The same sentiments are shared by Mortazavizadeh et al. (2017), who also indicate that this change warrants teachers to revisit and redesign the curriculum so that it suits multigrade situations, depending on the number of classes to be combined.

Engin (2018) argues that there is a need for the Ministry of Education and the faculties of education in countries practicing multigrade teaching to collaborate to develop a teacher training programme so they can improve different teaching strategies. The study by Reyes and Ching (2024) on the developmental needs of the multigrade teacher recommends that multigrade teachers must collaborate using a professional community platform where they share their challenges. Multigrade schools have been part of the education system in Lesotho for several years. However, teacher-training institutions are lagging as there are no programmes preparing teachers for multigrade teaching (MOET, 2005).

To teach multigrade effectively, teachers need to be able to select and modify material from the curriculum by:

- identifying the common elements or themes they can use to develop their programmes;
- identifying areas of the curriculum where topics can be integrated across subjects or grades; and
- deciding on the most effective way they can organise the teaching of topics or parts of a topic to their groups (Naparan & Alinsug, 2021).

To achieve all these requirements, the teachers must be equipped with a repertoire of teaching strategies that will embody the following:

- Providing a wide range of teaching strategies and learning materials (Brown, 2010; Naparan & Alinsug, 2021);
- Organising classroom space, such as physical seating arrangements, workstation arrangements, adequate space in the classroom for activities, available libraries in the classroom, and two or more chalkboards (Berry, 2006);
- Organizing learners effectively to reduce the amount of 'dead time' during which children are not productively engaged on task (Brown, 2010); and
- Monitoring the learning achievement of all learners by providing a regular formative mode of assessment that promotes learning (Berry, 2006).

Lesotho's education system has district resource teachers (DRTs) who are support persons, usually experienced primary school teachers who could be a former principal of a primary school. DRTs were specifically established to provide school-based support and training to remote schools, which have predominantly untrained teachers (IIEP Research Brief, 2016; Phamotse et al., 2005). They are mandated to offer support to a cluster of small numbers of isolated rural schools with a particular focus on supporting teachers with multigrade classes. DRTs are limited in number; as such, not all schools have a DRT. Hence, they are expected to visit the schools regularly. However, even within the clusters, the schools are often geographically spread, therefore few schools receive more than two visits per year (Phamotse et al., 2005). Consequently, how DRTs and teachers outline the practices in a multigrade classroom is influenced by their perceptions. According to Kuşcu and Zaimoğlu (2022), teachers' perceptions are the mental images that teachers have about their professional activities. Perceptions are informed by teachers' background knowledge and life experiences, which in turn influence teachers' professional behavior. It is therefore

imperative that understanding teachers' beliefs and orientations has a significant bearing on their practices in a multigrade classroom (Liepertz & Borowski, 2018).

Teachers' execution of effective strategies on teaching multigrades is premised on how they perceive multigrades and multigrade teaching (Naparan & Alinsug, 2021). This study is grounded in the concerns-based adoption model (CBAM) lens of Hord et al. (2009) to gain an understanding of how the teachers handle multigrade classes. This model exhibits several levels (Table 2) that a person experiencing change undergoes. These reflect various stages of concern (Hall & Hord, 2006). In the first level, concerns are more personalized as the user is trying to establish what the change is and how the change affects them. The second stage is more task-based or use-based, while the last stage is more focused on changing the configuration.

Table 2: Stages of concern

Stages of concern		**Expression of concern**	**Behavioral indicators of level**
Self-concerns	Awareness	I am not concerned about what I have to change	The user has no interest, is taking no action
	Informational	I would like to know more about it.	The user is taking the initiative to learn more about the change.
	Personal	How will using it affect me?	The user has definite plans to begin using the change.
Task concerns	Management	I seem to be spending all my time getting materials ready	The user is making changes to better organize use of the innovation
Impact concerns	Consequences	How is my use affecting students?	The user is making few or no changes and has an established pattern of use. The user is making changes to increase outcomes.
	Collaboration	I am concerned about relating what I am doing to what other instructors are doing.	The user is making deliberate efforts to coordinate with others in using the innovation.
	Refocusing	I have some ideas about something that would work even better.	The user is seeking more effective alternatives to the established use of the innovation.

Adapted from Hord et al. (2009) and Hall and Hord (2006)

Olson et al. (2020) further add the three diagnostic components to the model that improve on its use. The components are the Stage of Concern (SoC), Level of Use (LoU), as well as the Innovation Configuration Map (ICM). The SoC helps to identify individual attitudes and beliefs towards innovation, while the LoU identifies the behavior and actions that can lead to categorizing them at the stage of use or nonuse. The ICM identifies varying stages of implementation. For any form of training to be effective, it is imperative to understand the position of all concerns. Hence, only the SoC has been used as it is deemed relevant to the study because teachers in Lesotho have received training on monograde teaching and have been merely oriented into multigrade classes. As such, teaching multigrades is an innovation that they need to adopt. It requires teachers to be innovative in teaching strategies (Naparan & Alinsug, 2021), creating their teaching materials and adapting a monograde curriculum into a multigrade one (Haingura, 2014). Therefore, the model is used to better understand teachers' concerns and behaviors as they venture into implementing change, as well as concerns of the DRTs who are supposed to support these teachers.

The observation made by Moshapane (2004), cited by the World Bank (2005), is that despite widespread prevalence of multigrade teaching in Lesotho, there is no clear policy on multigrade teaching, no stringent training, and little support afforded to teachers in multigrade schools. The World Bank (2005) further reports that children who are in multigrade classrooms in Lesotho tend to perform worse in the Primary School Leaving Exam (PSLE), when compared to their counterparts. In this regard, it would be expected that the introduction of the revised Lesotho Integrated Primary Curriculum (IPC) in 2013 should have smoothed out situations for multigrade schools, so that the teachers can be skilled to meet the demands to produce effective, skilled learners. The study by Matobako and Hequa (2018) reveals that teachers struggle with multigrade teaching and its challenges in the light of the new integrated curriculum in Lesotho. Their findings are substantiated by Mulryan-Kyne's (2004) study, which has also indicated that teaching in multigrade classrooms is difficult to handle and less satisfying because of heavy workloads. The challenges are exacerbated by a lack of training, support, and resources (Reyes & Ching, 2024). Looking at the demands of effective science teaching in a normal classroom, then adding to that the demands of multigrade teaching, one can only conclude that a very skilled cohort of teachers is required to perform this task effectively.

It is with this background in mind that the researchers tried to establish the way the teachers themselves and DRTs perceive practices of the teachers when teaching science. The DRTs, through their work, have a close working relationship with these teachers, therefore their perceptions are also warranted. This would shed light on the kind of intervention that could be envisaged for such teachers. It is in the light of the observation made that this study sets out to investigate the perceptions of multigrade teachers and DRTs on the teaching of science in multigrade classrooms in Lesotho, the effectiveness of the teachers' practices, and the challenges involved.

The following research questions form the essence of this study:

- What are the perceptions of teachers and district resource teachers on the teaching of science in multigrade primary schools in Lesotho?
- How do these teachers perceive the effectiveness of their teaching practices?
- What kind of support do these teachers require to teach effectively within a multigrade science classroom?

3. Methods

To find answers to these research questions, this study adopted an interpretive qualitative research design. Interpretivists believe that reality is socially constructed by social actors and people's perceptions of it (Ormrod, 2023; Wahyuni, 2012). It involves integrating human interest into a study; therefore, "interpretive researchers assume that access to reality (given or socially constructed) is only through social constructions such as language, consciousness, shared meanings, and instruments" (Myers, 2008, p.38). Interpretivism, as opposed to the generalization approach adopted by positivist researchers, uses a narrative form of analysis to describe specific and highly detailed accounts of a particular social reality being studied, which is termed the idiographic approach (Creswell & Guetterman, 2025; Neuman, 2011). Interpretive design was considered most appropriate as it has enabled the researchers to understand the repertoire of strategies, feelings, experiences, beliefs, ideas, perceptions, and actions of teachers and DRTs concerning multigrade teaching (McMillan & Schumacher, 2010; Ormrod, 2023). Semi-structured interviews were used to gather information for this study. This type of interview offers the merit of using a list of predetermined themes and questions as in a structured interview, while maintaining enough flexibility to enable the interviewee to talk freely about any topic raised during the interview (Creswell & Guetterman, 2025; Ormrod, 2023; Wahyuni, 2012). The interview questions were developed and implemented using the aspects of multigrade teaching and were edited by the second and third researchers. The interview questions were then piloted with two teachers and revised accordingly. The first one-on-one face-to-face interviews were conducted with ten (10) multigrade teachers at their schools or the principal's office. This was followed by interviews with the three (3) DRTs. The teachers and DRTs were from the two Lesotho districts, namely Mokhotlong and Thaba-Tseka, which are dominated by multigrade schools. The teachers were purposively selected by virtue of their teaching in such schools. The rationale for the sample was that teachers would be the ones to give a rich report concerning their own pedagogical practices and experiences in the multigrade classrooms. DRTs were interviewed to provide rich information about pedagogical practices they observe to be employed by teachers under their jurisdiction in multigrade schools, as they work closely with them. The ATLAS.ti qualitative research tool was used to analyze data by coding and analyzing transcripts from interviews.

Ethical Considerations

Most educational research deals with human beings; therefore, it is imperative to consider the ethical and legal responsibilities of conducting research (Fraenkel & Wallen, 2012). In this study, permission was requested from the district education office, the principals of the schools involved, and participants. The first author, who conducted the interviews, explained the aim and objectives of the research to the participants. They were assured of their anonymity and the confidentiality of their responses. The participants were also told that they could withdraw from the research without any consequences.

4. Results and discussion

It is important to establish who the participants were and their relevance to the study. Table 3 provides demographic information on multigrade teachers and DRTs who were interviewed.

Table 3: Multigrade teachers and district resource teachers by gender, district, and qualification

Gender of district resource teachers	**District**	**Years as DRTs**	**Highest qualification**
3 Females	Mokhotlong 2	DRT 1: 15	Advanced Primary Teachers Certificate APTC
	Thaba-Tseka 1	DRT 2: 28	Diploma in Primary Education
		DRT 3: 4	Diploma in Primary Education

Gender of teachers			**Name of district**			**Highest qualification for the respondent**		
Gender	Frequency	Percent	District	Frequency	Percent	Qualification	Frequency	Percent
Males	3	30	Mokhotlong	5	50	COSC	1	10
Females	7	70	Thaba-Tseka	5	50	Certificate	3	30
Total	10	100	Total	10	100	Diploma	3	30
						Degree	1	10
						Other	2	20
						Total	10	100

Once all interviews had been transcribed, the data were then organized into main themes that were drawn from the research questions and then coded using the main themes emanating from the literature and theoretical framework. The results of the coding and analysis of themes that emerged from the perceptions of teachers and DRTs on the teaching of science in multigrade were formulated in the following:

- Grade combinations and lesson planning;
- Lesson execution, including effective organisation of the classroom to prevent ‘dead time’;
- Teaching science; and
- Challenges of multigrade and support needed.

4.1 Grade combination and planning of the lessons

On being asked what they perceive to be the practice in a multigrade classroom, four aspects such as organising classroom space, organising learners effectively, providing a wide range of teaching strategies and learning materials, as well as monitoring the learning achievement of all learners, were considered as the basis for their perceptions (Berry, 2006). Lesson planning and classroom organisation set the tone for the space utilisation and execution of activities. This involved the pairing of grades and the selection of the learning tasks. Almost all the teachers were unanimous in their responses that they planned and taught thematically where possible but staggered the activities for different grades when they got to the tasks.

When the themes were not the same, they planned and taught grades separately. Teacher #1 had this to say:

> *Before I start planning, I look through my syllabus and check if there are related concepts, if they are there, I put them together in the scheme and teach both grade 3 and 4 the same thing at the same time with the same lesson plan, I do this for all the subjects. (Teacher# 1)*

The same sentiments were shared by Teacher #8, who remarked:

> *There are some topics whereby you can see that this topic you intergrade with this one and you take it from there even though you may find that grade 5 I did a bit lower than grade 6 even when I do the lesson plan I take it from there, you can see that the activities will vary you can see that this is for grade 5 ad this is for grade 6. (Teacher #8)*

An interesting perspective, which emphasized the challenges of teaching in a multigrade while one is also a principal, came from Teacher #7, who commented:

> *...I no longer plan because even when I do then one or something can disrupt the planned lesson since I have to multitask as I am also the principal, so I don't bother with the lesson plan anymore (Teacher #7).*

They also indicated that where the topics were not the same, they taught them separately by giving the other grade group work to do while they proceeded with teaching the remaining grade. Teacher #8 said:

> *I plan them separately and when teaching in the classroom, I give the other group the other grade group work while I proceed with the other one even having done with grade 6, I give them some work to do and go back to grade 5. (Teacher #8)*

This is where much time is wasted, as the literature indicates that they do not normally prepare meaningful work with which to leave the learners. This method of teaching demands good and careful planning on the part of the teacher who has to decide which part of the curriculum will form a general theme and which parts will be part of differentiated work for specific grades (Combrinck, 2011). This, however, is not seen to be the case, as there was no specially prepared, meaningful work that could keep learners engaged.

All three DRTs indicated that their role was to act as a teacher support system in districts, especially when working with the multigrade schools. DRT #3 had this to say:

> *We support them on how to ehh with the techniques of tackling the multigrade. Such as how to make a lesson plan, especially how to manage the multigrade. (DRT #3)*

DRT #1 concurred by saying:

> *to help teachers, especially the multigrade teachers, to give them innovations and to disseminate whatever needs to be disseminated to them, such as the new curriculum, and the way how to handle multigrade/multistandard teaching, methods of teaching multistandard. (DRT #1)*

The DRTs were also asked whether the teachers in multigrade schools have received any training in that aspect. Their unanimous response was that teachers had received training in multigrade teaching. However, teachers have different perspectives, namely that they were merely orientated to the concept of multigrade. This is an important observation that is supported by Naparan and Alinsug (2021) and Vithanapathirana (2006), namely that multigrade teaching can still bear positive outcomes if effectively implemented. The starting point was to first establish how the grades were combined. Combining grades effectively will significantly determine the progress and coverage of the syllabus. This is because it is easier to find spiralling topics if one has consecutive grades. DRT #3 remarked as follows:

> *We ask them to assign the… when they allocate the classes to allocate them in such a way that they will be able to find the same concepts and plan them at the same time, and teach them at the same time, but the activities should vary according to the level of the grade they are teaching (DRT#3)*

However, in practice, they indicated that teachers were not combining the grades properly. They also indicated that combining grades, such as grades 1 and 7, made it impossible to find common themes. This is one of the perceived challenges of multigrade teaching observed. This is one strategy that ensures progression in teaching. On being asked what they could say about how the teachers were expected to plan and how they observed teachers' plans, DRT #3 said:

> *First of all, the lesson plan, the objectives should show that they are meant for more than one class, and the activities will show me that these activities are for the lower grade and these are for a higher grade (DRT #3).*

DRT #1 added:

> *I am expecting that, for instance, if the teacher is teaching three (3) grades each and every grade should be learning at the same time. If he is introducing a new lesson to one grade, other grades should be given something to do. Should be prepared, should have been prepared ehhh what we call ehh….what?(DRT #1)*

DRT #2 concurred by saying:

> *I expect to see a teacher well prepared, having a variety of materials, occupational tasks, grouping method so that when he/she is with another grade, the other grade have something to do under the supervision of a group leader (DRT#2)*

These results indicate that both the teachers and DRTs subscribe to thematic teaching where it is possible.

4.2 Execution of lessons

The DRTs were then asked about how they saw the teachers executing the lessons. They observed teaching dominated by traditional teacher-centred methods where the teacher mostly talked to explain a science concept, while learners were mostly passive. They also observed a quasi-monograde way of teaching, where teachers would introduce a concept, followed by leaving learners with some individual tasks to do, while they moved to the next grade, and the same teaching process was repeated. This was confirmed by DRT #1 as follows:

> *I am expecting that, for instance, if the teacher is teaching three (3) grades each and every grade should be learning at the same time. If he is introducing a new lesson to one grade,*

> *other grades should be given something to do. Should be prepared should have been prepared ehhh, what we call ehh…what? especially in multigrade, we make use of group work, in a group work, there will be a leader, so the leader will still facilitate the learning of the grade while you, the teacher, are ehh introducing whatever a new lesson to the other class (DRT #1).*

In accordance with DRT #1's statement, DRT #2 added:

> *Yes, so that in her/his absence, the group leaders should see to it that learning is taking place, and the material that I talked about will be used for occupational tasks. I also expect the multigrade teacher to manage time, but I have seen that they don't manage time as expected for a multigrade teacher, because a multigrade teacher is not,, if it is a thirty (30) minutes lesson she is not expected to spend 30 minutes with one grade but less than that, we encourage them to introduce the lesson in ten (10) minutes leave it with the group leader and then move to another grade so that in her absence the work is being done so that when she comes back she finds that the grade have completed work leaving the other grade with the activity (DRT #2)*

This way of teaching is found to greatly reduce instruction time for each grade; hence, teachers complained that they rarely completed the prescribed syllabus for a grade. Planning for multigrade teaching is the most crucial part of teaching. The larger part of what they are going to teach must be translated into interactive, self-study, graded learning material meant to support individual, peer, and small group learning with teachers' support (Brown, 2010; Combrinck, 2011).

4.3 Teaching science lessons

4.3.1 Execution of a science lesson

For science to be effectively taught in a way that helps learners not only acquire knowledge but also skills, the teaching process must provide learners with opportunities to experience and construct knowledge by themselves (Ngan & Bui, 2021). To establish how the teacher ensures the development of scientific skills, the teachers were asked how they taught science. Teachers seem to concur that learners must discover things for themselves by using demonstration, discussion, and experiments. However, they indicated that doing experiments in a multigrade classroom was not easy owing to the time factor and lack of resources. Teacher # 9 had this to say:

> *Sometimes I just use this method for them to experiment, not every time, sometimes I just tell them it will be like this and this. (Teacher # 9)*

Teacher #10 remarked:

> *Experimentation because hakere they see they manipulate; we want them to find things on their own, but without the resources. Science kit is there, but some things are there, some are not there, but we don't know what are they and how to use them. (Teacher #10)*

4.3.2 Challenges they experienced

On being asked about the challenges they experienced, Teacher #4 mentioned the following:

> *....is it not easy to do experiments in a multigrade class, ... I must emphasize that it is not easy if there are no experimental resources or materials, then one resorts to doing demonstration. (Teacher #4)*

They also mentioned that teaching in a multigrade classroom involved too much work; there was no rest. This has implications for how they prepare and execute their other classes. During interviews that were carried out at schools, it was observed that the classrooms had ample space and there were some science kits. However, teachers did not seem to know how to use them and were not using them, but they were aware that they should let learners manipulate objects in the science kit (Letsaba et al., 2016). The teachers' responses were in contradiction to what DRTs expected: that was allowing learners to inquire so they could construct their knowledge. DRT #1 elaborated on this by saying:

> *I don't want the teacher to… we are expecting the teacher should just talk, to make ehh oral lessons, the learners should manipulate, they should use different senses ehh when in a science lesson. (DRT#1)*

Ngan and Bui (2021) argue that the teaching of science should include creating a rich, conducive environment that fosters meaningful engagement in learning. This can be achieved by shifting from passive lessons to an open process where learners can investigate and discover science on their own. To establish this, the next question asked was how they expected those teachers to help learners in multigrades to develop the scientific process skills. DRT #2 said:

> *I think learners can acquire those skills if they are encouraged to do things and able to find things for themselves, if they are able to find out, things like the discovery method, if they experiment, they carry out experiments, they will be able to discover, but these methods are not applied. (DRT # 2)*

Similarly, DRT # 3 stated:

> *We usually want them to use experiments but, in most cases, they are not doing them. (DRT#3)*

The DRT #3 went further to indicate that:

> *We want them to encourage learners to find things for themselves, but they are the ones that are spoon-feeding the learner (DRT#3)*

In agreement, DRT #1 commented:

> *I don't want the teacher to... we are not expecting the teacher should just*
>
> *talk, to make ehh oral lessons, the learners should manipulate, they should use different senses ehh when in a science lesson. In my area, most of the teachers have acquired this, I said I am helping them deal with this multigrade, especially deal with the practical lessons, not oral lessons, the apparatus should be prepared well in advance, and now let children learn with the help of these apparatus (DRT # 1)*

DRT #2 added:

> *I just see them lecturing, they don't collect material, they stand there and just tell learners, and so and so forth, it is not done practically, nothing to manipulate (DRT#2)*

It is apparent that in most multigrade classrooms, experimentation and manipulation are minimally done. Thus, meaningful engagement of learners and the construction of their own scientific knowledge are also minimal; hence, the poor performance in general. This is also the most observed situation in conventional schools; therefore it can be argued that the situation is exacerbated in a multigrade classroom. On being asked what kind of training they thought the multigrade teacher must have, DRT #1 responded:

> *They require to be trained ehh on different methods of approaches of teaching science lessons, even not only science, every subject or learning area or unit they should be helped ehh on how to approach every subject, every learning area, every unit. (DRT #1)*

DRT #2 said:

> *I just see them lecturing, they don't collect material, they stand there and just tell learners, and so and so forth, it is not done practically, nothing to manipulate (DRT #2)*

What can be drawn from the DRTs' responses is that although they encourage the use of science material so that learners can manipulate these and make their own scientific discoveries, they observe the totally opposite happening in the classroom. The teaching is dominated by teacher talk and not much learning of skills. This confirms the study of Combrinck (2011), who found that multigrade classrooms were more teacher-centred than learner-centred, and content-driven, as flexibility was not practiced, thus they denied learners the opportunity to develop discovery learning and independence.

4.4 Support needed by multigrade teachers

On being asked what kind of support they would like regarding multigrade teaching, in general, they responded that teachers need to be given proper training on effective multigrade teaching and on time management. Teacher #8 stated:

> *…ehh, I do think on time management, how to manage time so that I may do more… (Teacher # 8)*

However, DRT #2 argued that teachers could benefit if they were trained in the development of appropriate teaching materials. DRT #2 said:

> *".. they can be trained on time management, on handling of multigrade, they have to be retrained on the new curriculum focusing on different areas, but they have already been trained what is necessary is follow-ups (DRT #2)*

Multigrade teaching's worst effect is dead time, where learners spend a great deal of time not doing meaningful work (Berry, 2006; Brown, 2010; Kivunja, 2014). Time management is therefore of the essence in alleviating the situation.

These results show that teachers unanimously indicated that they planned and taught lessons thematically to accommodate the combined grades where possible but staggered the activities for different grades when they reached the tasks. The DRTs share the same sentiments, namely that the grades should be combined thematically in line with what the literature suggested (Berry, 2006). However, there were some schools where combinations could not allow thematic teaching, such as where grades 1 and 7 were combined.

The actual teaching is found to be dominated by teacher talk, dispersed with questions here and there. When teachers move to another grade, they do not leave the previous grade with meaningfully prepared work. This, therefore, leaves a great deal of dead time that is not used profitably. This is substantiated by literature everywhere, namely that multigrade classrooms are more teacher-centred than learner-centred, and content-driven, as flexibility is not practiced. Thus, they deny learners the opportunity to develop independence (Combrinck, 2011; Tiernan et al., 2020). The teachers indicated that they carried out experiments so learners could perform these practically, although a lack of resources hindered them. This implies that in most multigrade classrooms, experimentation and practical work are minimally done. This observation is substantiated by the DRTs, who indicated that they saw teachers just telling and not allowing discovery learning. Thus, meaningful engagements of learners and the construction of their scientific knowledge are also minimal. Ngan and Bui (2021) argue that for science to be effectively taught, students must be provided with opportunities to experience and construct knowledge by themselves. In general, teachers need to be given proper training in effective multigrade teaching and on time management. Studies reveal that there is not much training afforded to multigrade teachers (Berry, 2006; Kivunja, 2014; Matobako & Hequa, 2018).

5. Conclusion

Drawing from the SOCs of the CBAM model lens, the teachers' perceptions seem to lie around the first two levels, namely self and task concerns. Many teachers seem to be stagnating at the self-concern stage, where they are trying to understand multigrade teaching, gathering more information on ways to deal with it, and weighing the impact of using multigrade skills. They also seem to show the features of management, which is the first part of the task stage, where they are trying to understand how multigrade works and collecting materials that can assist them. The teachers and DRTs perceive multigrade teaching as necessary in rural areas. However, they concur that its implementation is challenging, and they believe that it compromises learners' education. Literature, however, indicates that teachers can only feel this way if they have not experienced the impact of systematic multigrade teaching. While the DRTs emphasized that teachers received training, most teachers indicated that they did not receive any. Even those who claimed to have been trained were mainly reoriented but not trained as could be expected. Multigrade teaching is a complex task; thus, well-thought-out training that addresses a myriad of concerns must occur.

It can be concluded that the training or orientation was inadequate in helping teachers cope with the complexity of multigrade teaching. Teachers claimed that they adopted thematic teaching, and they perceived it to be an appropriate method; however, thematic teaching was minimally carried out, and the activities were not well staggered. Quasi-monograde teaching was common and dominated by teacher talk. Hence, the strategies that allowed learners to discover knowledge on their own and construct their own understanding were not utilized. This was also confirmed by the DRTs, who indicated that teacher-centered teaching was dominant even in science teaching, despite their encouraging the teachers to allow learners to carry out the investigations.

Teachers also claimed multigrade teaching offered the learners an inferior education and wished it could be abolished. Some studies cited challenges such as work overload, demotivation, lack of resources, and incomplete syllabus coverage. The study recommends that multigrade teaching should not be underestimated; instead, it should be given a deserving place in the curriculum. Findings provide the necessary data that can inform the formulation of multigrade policy and the development of an intervention strategy. This study recommends reskilling through the training of teachers on how to handle a multigrade situation. This is because Combrinck (2011) posits that if multigrade education is properly developed and implemented, it could be a way of achieving quality education in many rural areas. This

fact is substantiated by Mabova et al. (2022), who indicated that well-organized teacher professional development activities could assist in reskilling the teachers' pedagogical skills. Therefore, the Lesotho curriculum should include multigrade teaching. In addition, in-service teachers must develop their pedagogical skills to enhance teaching of science and promote meaningful and productive learning in the classroom.

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