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Teachers Identified Challenges to Implement Differentiated Instruction in Mainstream Primary School Mathematics Classrooms

Thabisile Maphumulo[a], Piera Biccard[a*]

[a]*Curriculum and Instructional Studies, University of South Africa, Muckleneuk, 0003, South Africa*

** E-mail address: biccap@unisa.ac.za*

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Abstract

Differentiated instruction is finding more grounding and impact in education around the world. As classroom diversity is anticipated and welcomed, teachers need to implement differentiation practices as part of their usual practices. However, this is known to be a more challenging task than first thought, with the challenges that teachers face being interrelated and complex. In this study, the researchers focus on twelve rural and peri-urban primary school mathematics teachers and two district officials, their identified challenges in implementing and practicing differentiated instruction. The research was qualitative in nature. Teachers participated in semi-structured individual interviews and focus group interviews. The researchers use the framework of differentiated instruction across content, processes, product, and environment to frame teachers' responses regarding their experiences with differentiation. Teachers indicated that challenges occurred in four broad areas: time, resources, overcrowded classrooms, and parental support, suggesting the need for further professional development in this area. The researchers recommend that differentiated instruction is not viewed as a special instance of teaching, but that all teaching take on a differentiated nature in keeping with teaching for excellence and inclusivity.

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1. Introduction

Differentiated instruction (DI) is a pedagogical approach that aims to address the diverse learning needs of students within the classroom. Research has shown that successful implementation of DI is associated with teacher efficacy, as it is an important dimension in enacting differentiation across various content areas and grade levels (Dixon et al., 2014). However, challenges in the implementation of DI have been identified, particularly in primary schools, where the understanding and application of DI strategies may not be at the desired level, and differences between public and non-public schools are less visible (Ismajli & Imami-Morina, 2018). Furthermore, studies have highlighted the need for practical and concrete advice to support teachers in designing and implementing differentiated instruction to effectively address classroom diversity (Pozas et al., 2019).

In the context of specific subjects, such as mathematics education, research has employed qualitative methods to investigate the challenges and practices of differentiated instruction, providing insight into the difficulties faced by teachers in enacting DI in the classroom (Adare et al., 2023). Furthermore, the relationship between teacher self-efficacy and their practice of differentiated instruction has been explored, demonstrating a significant positive correlation, indicating that teacher self-efficacy influences and predicts their implementation of DI (Ramli & Yusoff, 2020). In addition, the impact of differentiated instruction on student achievement has been a focus of research, with evidence suggesting that when differentiated,

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enriched reading instruction is implemented, students' reading fluency and comprehension can be as high or higher than those in traditional instructional approaches (Firmender et al., 2013).

However, challenges have been identified in using and implementing differentiated instruction to address the needs of specific student groups, such as lower third students, which can affect the intensity of rigour in learning environments (Charles, 2018). In summary, existing research on teacher challenges in implementing or implementing differentiated instruction encompasses various dimensions, including teacher efficacy, subject-specific practices, impact on student achievement, and the need for practical support and advice for teachers. These studies provide valuable information on the complexities and potential benefits of differentiated instruction in diverse classroom settings.

The context of the study is similar to that of Melesse's Ethiopian study (2015, p. 254), in that South Africa is also a "multi-lingual, multi-ethnic, multi-cultural country, there needs a practical approach of teaching that tries to address the diversified learners needs and interests". Therefore, this study aims to assess the perceptions of the challenges of DI of South African primary school teachers in one province. The challenges faced by rural Science, Technology, Engineering and Mathematics (STEM) teachers in South Africa have been investigated, revealing the need for effective teaching and learning strategies in rural areas to improve learners' performance in STEM-related subjects (Mutambara & Bayaga, 2020). Furthermore, truly little research has examined the perspectives of teachers on differentiated teaching in multicultural South African secondary schools, shedding light on the complexities of implementing differentiated instruction in diverse classroom settings (e.g., de Jager, 2017). Since studies focussing on teacher experiences and different understandings of differentiated instruction are lacking in the South African context, it was considered necessary to explore this area of research further.

Against this background, the research question for this study is as follows.

What challenges do rural and peri-urban mathematics primary schools teachers identify when enacting differentiated instruction in their classrooms?

1.1. Differentiated Instruction

Differentiated instruction in mathematics seeks to guarantee that every student has the opportunity to realise their full mathematical potential and lay a strong basis for lifelong learning; therefore, it is important in the subject to identify and meet students' diverse needs. DI is an interdisciplinary set of pedagogical strategies and initiatives that allow pupils to have a variety of approaches to learning so that they can make meaning of what is being taught (Tomlinson, 1999). Terwel (2005) describes differentiated teaching as a process of identifying, streaming, and tracking the ability of certain individuals and/or groups to respond to their needs.

Differentiated instruction focusses on children with a range of levels and various needs (Westwood, 2016), however, it is still not widely implemented, understood, or adopted. To successfully implement differentiated instruction, teachers should gradually advance variety and a range of teaching styles in their classes. Since mathematics teachers use differentiated instruction as a strategy to improve their teaching by adapting it to the identified student's needs, styles, interests, and readiness through teaching and assessment, effective mathematics programmes should engage students meaningfully. Through experiences and abilities, students can make sense of mathematical concepts (Leinwand, 2014). Teachers should think about several ways to maximise the lesson's learning objectives when presenting the lessons to accommodate diverse students. The teacher should take into account certain practices when organising and leading the lesson during the presentation.

According to Smets (2017), when a student first enters a class, teachers should build on their prior knowledge. The selection of teaching strategies should be considered according to the needs of all students in the classroom. This means that the primary learning process should be adaptation and student-centred; therefore, the teaching strategies and learning materials used must be adapted to meet the diverse identified needs of students. However, it is known that diverse classrooms pose challenges and require teachers to develop a variety of activities to help students in their learning (Melesse, 2015).

For this study, the terms differentiated teaching (DT) and differentiated instruction (DI) are used interchangeably. It is viewed as a flexible approach to teaching and learning, whereby teachers respect student variety by establishing tasks in several ways in the same classroom so that all students can meet curricular objectives. DT helps to reach each student's individual success and development by facilitating learning through teachers' instructional decisions. In addition, DT is an approach and philosophy of education that seeks to address the diversity needs of students (Adare et al., 2023). Ginja and Chen (2020)

reiterate that the goal of DT is to develop a proximal development zone that allows learners to interact with knowledgeable adults or peers as suggested by Vygotsky (1986).

1.2. Theoretical Underpinnings

The study uses Tomlinson's (2004) differentiation framework to understand how mathematics teachers can implement differentiation in their classrooms. This differentiation framework shows how teachers can differentiate in four fundamental areas of instruction. Teachers can differentiate the content of their lessons, providing more accessible content to various groups of learners. This strategy is not always useful when teachers, as in the case of this study, have a content-specific curriculum to cover during a specific time. The second strategy is to differentiate the instruction process, which means that teachers consider different teaching approaches to accommodate diversity in their classrooms. Process differentiation is also known as activity differentiation (Hapsari & Dahlan, 2018). The third strategy is to differentiate the product. In this case, teachers will change what students must produce because of their learning. The teacher may require that some groups write, while others may draw their response. The fourth strategy is to differentiate the environment, that is, to change some aspects of the classroom to facilitate learning outcomes for students. This could mean changing how the classroom is organised, for example, the routines, procedures, and physical arrangement of the classroom (Ginja & Chen, 2020) or being sensitive to the affective aspects of students. Adaptation of learning also means that teachers differentiate instruction and manage activities simultaneously (Tomlinson, 2001). The four aspects of differentiation by Tomlinson, which focus on how proactive teachers respond to student needs when they differentiate their instruction, guided the study.

2. Methods

The qualitative approach was chosen for this study because it allowed the researcher to concentrate on understanding the experiences and perspectives of teachers about the application of curriculum differentiation when responding to the diverse needs of their students in the classrooms. According to Denzin and Lincon (2008), human experiences reveal their reality. The interpretivist paradigm is strongly associated with qualitative research methodologies; Dhence it was adopted, and with its ideology that the truth is discovered once people describe their situations, it enabled the researcher to generate data using different methods (Thanh & Thanh, 2015).

To provide detailed and rich information from the field, the study collected data from 14 participants purposefully sampled from the Umlazi district. The group of participants consisted of twelve primary school mathematics teachers and two district-based officials. Mathematics teachers from both rural and peri-urban school contexts were purposively sampled having similar characteristics (Lim & Ting, 2012), i.e., teaching mathematics for more than five years. District officials with a background in providing support to mathematics teachers were sampled. The researchers used semi-structured interviews. However, the interview questions themselves were different, that is, the interview guides for teachers and district officials were different to allow participants to give their views, opinions, and experiences on the implementation of DI from their background and expertise (Hair et al., 2011).

To facilitate reading of the data, the following abbreviations are used: RT (Rural teacher), PUT (Peri-urban teacher), DBSTM (District based support team member), FGPUT (Focus group peri urban teachers), FGRT (Focus group rural teachers).

3. Results & Discussions

3.1. DT is Time-consuming

Although most teachers demonstrated a willingness to support learners with diverse needs, empirical data show that teachers are concerned about the time they spend helping learners who needed extra attention. Teachers found that implementing or enacting DT proved to compromise the annual teaching plan as it takes a lot of their time to accommodate learners with diverse needs because you must give them extra time to complete class activities.

RT2: *The issue with DT is that there simply is not enough time to cover the work that is expected while making time to fully differentiate.*

RT4: *There are challenges with time, learners struggle to understand maths concepts in English or instructions then, you must explain it to them in their mother tongue, especially word sums, which takes a lot of time.*

RT5: *There are learners whom you think will improve after sitting with them one-on-one for a long time but despite my efforts and time, they do not improve.*

PUT1: *Even in a class with few cases, those few alone take up more of your energy and time because you focus so much attention on them trying to assist.*

PUT5: *It is exhausting and difficult*.

Time was also needed to create a variety of teaching strategies to help students understand.

PUT1: *Time, using different methods takes up a lot of time.*

PUT5: *It takes time to explain concepts* [again] *to some learners, and the curriculum coverage suffers.*

(Data from Maphumulo, 2024)

In terms of Tomlinson's DT framework, the responses of our teachers focus purely on the differentiation of the process (the teaching methods and strategies that teachers try to implement). Since the curriculum that these teachers use is primarily content-based, it is unlikely that these teachers opted for differentiation of the content. When the researchers further explored teachers' experiences with DT in terms of time and curriculum coverage, the results of this subtheme revealed that some teachers interpreted DT as a complex challenge. Sometimes, the effort and time of adaptation of the content do not yield satisfactory results at all, in a review of the literature on DT, Lavania and Nor (2020) found that the second most cited challenge by teachers for DT implementation is the time factor. Lavania and Nor (2020) further classified time as an external factor in DT implementation.

From the Ginja and Chen study (2020), it was found that teachers sometimes have a theoretical understanding of DT, but the practical implementation of DT is problematic. However, if teachers view DT as an 'added' teaching requirement and not as part of their initial planning, it becomes a time-consuming activity. To Hapsari and Dahlan (2018, p.2), "teachers consider individual students before determining the learning plan that the learning readiness, interest, and learning profile of the students are not neglected".

A time factor is reinforced by Schoenfeld's (2010) theory of teacher decision making which proposes that teacher goals are time-bound, hence modification of the content or learning environment to suit students' needs can compromise the curriculum implementation time frames. It requires time management skills and influences which strategies teachers can employ to select content, processes, and products to achieve the set lesson objectives. Using DT is an extremely time-consuming task. Planning, establishing and presenting in a large classroom environment takes many hours (Ginja & Chen, 2020).

3.2. Resource Challenges

District-based team members (these participants are employed in district offices with the function of monitoring and supporting teachers within their district) pointed out their own challenges regarding the implementation of differentiated approaches. While Lavania and Nor (2020) state that previous studies expressed that teachers face challenges in searching for appropriate material or resources for their lessons, the district and teachers in this study focused on the need for more human resources to ensure that DT could be realised in their classrooms.

They mentioned concerns about the availability of human capacity, and they expressed it as being beyond their control. Alluding to a lack of human resources to provide essential support, the participants said:

DBSTM1: *I will start with the problem of human resources, I am the only one, and there are 500 schools in the district.*
DBSTM2: *More experts are needed to help*.

Even teachers noticed that district support was compromised due to lack of human resources.

FGPUTs: *There is only one person allocated to our district. Things pile up for her; the assistance is not adequate.*

Turning to teachers who cited lack of physical teaching resources or materials as a significant challenge, rural and peri-urban teachers in both the individual and focus group interviews said:

RT1: *Because of lack of resources, we only use verbal explanations and drawings on the board.*

FGRTs*: If we can be able to photocopy the teaching material and prepare it ahead of time, it would be easier.*

PUT6: *Yes, we do differentiate our teaching in our classrooms as teachers even though we encounter difficulties as teachers. Resources are not relevant to the type of learners we teach.*

FGPUTs*: Appropriate resources will help us to support more.*

RT2: *We are not given resources specific to subject topics, like 2D or 3D shapes. I create them myself with paper for learners to have concrete objects, that they can hold.*

RT1: F*or example, if I were to teach a time topic, I do not even have a clock for the learners, something that is so easy to provide.*

RT4: *The resources are not enough at all; for instance, when the network is bad, sometimes we want to play videos for learners. We have a TV connected but we do not have data, so we need Wi-Fi from the school.*

RT3: Regarding resources, we must ask learners to bring things like paper so that we can make photocopies. I either draw topics myself or use examples around the classroom like the cupboard for topics like shapes. We have written a list at the beginning of the year, but nothing came.

PUT2: *We do not get resources from the school. For five years the school told us to make requests for the things we need in the classroom at the beginning of each year, but until now it has not happened.*

(Data from Maphumulo, 2024)

Notable from the teacher responses is their knowledge that appropriate resources can assist with DT. Furthermore, teachers' commitment to using resources is evident, even if they must make the resources themselves. The researchers also note that teachers demonstrate an understanding of the type of resources they need. Those provided to them via generic distribution of resources given to schools from districts or provincial education departments are not always suitable for their specific students. Teachers focussed on teaching resources, which are process and environment elements.

Although the researchers agree with Putra (2023) that the teacher is the most key factor in successful DT implementation, it is challenging to practice DT without the relevant resources. The purpose of teaching and learning resources is to supplement and improve the roles that teachers play in the classroom, not to take their place. Resources are useful tools to achieve learning objectives and results (Milligan, Koornhof, Sapire, & Tikly, 2018). Teachers indicated the importance of resources in achieving lesson objectives and meeting students' needs. Verbal explanations or drawing boards are limited and cannot reach all students in the classroom.

Several factors are considered when teachers make decisions about the resources, they will use in the classroom, e.g., the learning objectives, the subject content, and the preferences of the students. By choosing and using suitable resources, students can become more active participants in the lesson. They can support teachers in motivating and involving students in the learning process, as well as in explaining, illustration, and reinforcement of ideas and skills (Riet, 2015). The successful implementation of DT is compromised due to a shortage of support staff based at district offices. Identification and meeting of each student's unique requirements may be hampered by a shortage of support personnel, such as counsellors and special education specialists, due to the inability to provide required information to teachers. The existing district staff can be stretched due to workload, which will reduce their general efficiency and enthusiasm. Furthermore, inadequate, or out-of-date teacher training programmes are offered, which will deteriorate the credibility of DT as a strategy to respond to the diverse needs of students. Melesse (2015) found that low training exposure results in low practice of DT. Furthermore, studies have highlighted the need for practical and concrete advice to support teachers in designing and implementing differentiated instruction to effectively address classroom diversity (Pozas et al., 2019). A shortage of human capacity can hamper the implementation of policies. Since education districts are required to collaborate with school leaders and teachers, providing direction and professional support, their job is essential to school success. (Bantwini & Moorosi, 2018).

3.3. Overcrowded Classrooms

Continuing the discussion with teachers of a peri-urban school, some participants described the challenges of overcrowding in the classrooms, emanating from the challenges. In further discussing their experiences in meeting the needs of diverse learners, the issue of the teacher-student ratio was expressed with sensitivity. This was a course of concern reflecting on the student policy that they should not be over 40 in the classroom. Their utterances showed that they were against the overload that comes with DT.

FGPUTs: *One challenge is overcrowding in our school. I do not think you can differentiate easily when the classroom is overcrowded unless you have more people who are working with you in the classroom like the teaching assistants.*

FGPUTs: *Overcrowding is an issue. Even if the teacher ratio can change, the floor space in classrooms is a challenge.*

FGRTs: *Larger class sizes do not allow us to move around freely.*

PUT1: *It is a challenge. We have a lot of learners because of overcrowding.*

FGRTs: *The class sizes are around 40 learners, but they have different abilities, and their needs vary a lot.*

PUT5: I have planned for three different groups, namely highflyers, another group that needs much more of my support, and lastly, one group that is grade appropriate. I have a total of 50 in one class, and all of them demand my attention.

PUT5: *Overcrowding is catching up on us. It is not easy to differentiate teaching when the classes are overcrowded. I teach three different groups at a time.*

(Data from Maphumulo, 2024)

It has been observed that teachers were unable to smoothly differentiate teaching in their classrooms due to overcrowded classrooms. Meier and West (2020) attested to the challenges of overcrowded classrooms in South Africa, one consequence being the difficulty in implementing differentiation. Adare et al., (2023) reveal that even a class size of 30 is too challenging to manage DT effectively, while our participants cite class sizes of 40 and 50 students. Teacher training for DT in large classrooms seems lacking and can contribute to ineffective implementation of DT.

Although the teachers in this study show that they implement DT, its effectiveness may be compromised by a lack of meaningful training opportunities specifically aimed at large classes. The comments of our participants focus on the process and environmental aspects of DT. Ogunkunhle and Henrietta (2018, p.3) remind us that "mathematics teachers will find it difficult to consistently find single tasks that are moderately challenging for all learners in a class that includes a range of readiness and experiential levels", a task even more onerous with large classes.

There were various challenges that disrupted the effective implementation of various learning needs, such as resources, overcrowding, and limited time to offer additional reporting issues to unaligned reporting procedures. Additionally, classroom overcrowding impacts and presents challenges such as neglected didactics, unruly behaviour, and unfavourable teacher attitudes (Meier and West 2020). It has already been identified that teachers "teach-to-the-middle [...] expecting all students to do the same activity, work at the same pace, do the same homework, and take the same test " (Adare at al., 2023, p. 81). This phenomenon is compounded in overcrowded classrooms.

3.4. Lack of Parental Involvement

Teachers indicated that parental participation in the schooling of their children was limited. It is apparent that parental involvement has a significant impact on improving students' achievement socially and emotionally (Suprayogi & Valcke, 2016). Parents' involvement also has a significant role in boosting their children's behavior and self-esteem. Parents can also offer sustainable environments for their children to transfer what is taught and learnt at home and school. Teachers were concerned that parents did not demonstrate a positive support towards the education of their children, and the lack of parental involvement was evident in these comments.

PUT5: *Most of the time parents fail to assist us once the learner has been identified as having a learning difficulty; they refuse to accept and help us.*
RT1: *I will say that even the parents we work with do not have much care for their children. We ask them to come to school, but they do not show up.*
PUT3: *Parents think schools provide everything, so they just push them to our school without giving them help at home.*
RT2: *Parents are the people who are closest to their children, but they do not come* [to school when required]*, they do not help them*.
RT 3: *Parents of learners who are doing well, do come to school when they are summoned but not those who have struggling learners.*
RT5: *Some learners are struggling because they lack love and attention at home.*

(Data from Maphumulo, 2024)

Parents have a social responsibility to provide education for their children. The data reveals that teachers consistently felt that parental involvement was lacking. Teachers' sentiments were unanimous: to be able to support students with various educational needs, parents must do justice to their children by accepting a partnership with the school to ensure success. Research (e.g., Otani, 2020; Waluyandi et al., 2020) denotes the correlation between parental involvement and learning performance. Furthermore, parental involvement can effectively benefit children if there is a positive partnership between teachers and parents (Munje and Mncube, 2018). Our participants' comments refer mostly to parents attending meetings with teachers, while most studies focus on parental involvement with homework, Torrecilla and Hernández-Castilla (2020) found that parent attendance at school meetings had a noticeable effect on student performance.

To establish a more inclusive and fair learning environment, parents are expected to help identify areas that need further improvement in their children. Parental participation can give teachers a clearer understanding of the cultural background, interests, and skills of their children; this, in turn, can help teachers build individualised educational strategies. Students can adjust academically if other various forms of involvement can be shown, for example, parents attending school functions and talking to their children about their schoolwork (Barger et al., 2019). Heng and Song (2020) surmised that parental resistance to DI may be due to perceived unfairness that leads to anxiety in parents. This may explain why parents are reluctant to attend school meetings with teachers.

3.5. Discussions

Meier and West (2020) maintain that didactic neglect includes a lack of differentiated learning. The researchers agree with Hapsari and Dahlan (2018) that a single instructional method does not accommodate heterogeneous students. Teachers confirmed that supporting students to achieve desired outcomes takes much effort and time to tailor suitable pedagogies or strategies in the classroom, confirming the results of studies in other contexts (e.g., Ginja & Chen, 2020; Hapsari & Dahlan, 2018). Time for lesson planning and time for adapting content, learning process, and assessment were referred to as difficult in the implementation of DT. The participants' comments focus on the process and environmental aspects of DT. As mentioned above, the curriculum is predetermined and inflexible, which may be why teachers did not mention content-based DT strategies. The lack of product-based DT strategies may infer a need for further teacher development in DT.

Overcrowding in classrooms makes it impossible to teach effectively, and most teachers deal with issues related to evaluation, discipline, teaching, and physical health (Khan & Iqbal, 2012). Connecting this challenge with social rights, Davis (2019) asserts that classroom overcrowding can be a barrier to learning, as it limits the provision of appropriate knowledge according to students' abilities.

Teachers must obtain relevant DT knowledge through continuous training (Melesse, 2015) since Lavania and Nor (2020) identified DT knowledge as the challenge most cited in implementing DT. Suitable and ongoing training may mediate many of the challenges cited by the teachers in this study. Furthermore, the realisation of excellence and equity (Adare et al., 2023) is vital for any mathematics classroom. It appears that the study participants have the philosophy of DT at heart but find day-to-day implementation more challenging. The researchers contend that adequate and meaningful professional development can mediate the challenges these teachers faced in implementing DT in their classrooms. A 'mismatching phenomenon' (Ginja & Chen, 2020, p. 794), where teachers want to implement DT but are doing it fragmentarily, is relevant in this study and could stem from inadequate training and misconceptions regarding DI (Ginja & Chen, 2020).

Poor parental involvement in their children's education is known, especially for children who needed support with their mathematics learning. With improved teacher professional development, teachers may be better positioned to inform parents about strategies that they can use to assist their children and explain that all children have different learning needs, thus mediating parent resistance. Teachers who receive regular in-service training may be able to call parent meetings and create a more supportive environment for students who need assistance with mathematics learning. Parents can also help teachers create home-made resources to assist all students in the classroom.

The researchers add their voices to Pozas et al., (2019), highlighting the need for practical and concrete advice to support teachers in designing and implementing differentiated instruction to effectively address classroom diversity (Pozas et al., 2019). The researchers know that differentiation is valuable in learning mathematics, but the researchers cannot expect teachers to navigate the challenges of time challenges, resource paucity, overcrowded classrooms, and parental resistance alone.

4. Conclusion

This article undertook to explore teacher identified challenges when implementing DT in mathematics classrooms in rural and peri-urban areas of South Africa. Teachers highlighted four main areas of concern: lack of time for DT planning and implementation as well as lack of suitable resources - the teachers knew which resources they needed and were even prepared to make them. In addition, the teachers also cited overcrowded classrooms that compromised their efforts with DT implementation, and they noted a lack of parental involvement – specifically parents being reluctant to attend meetings to discuss their child's progress.

The researchers recommend that differentiated instruction is not viewed as a special instance of teaching, but that all teaching take on a differentiated nature, in keeping with teaching for excellence and inclusivity.

References

Adare, A., Li, Y. & Gebresilase, B. (2023). Assessing Practices and Challenges in Implementing Differentiated Instruction in Mingde Primary School. *Open Journal of Social Sciences*, 11, 79-100. Doi: 10.4236/jss.2023.112007.

Bantwini, B. D., & Moorosi, P. (2018). School district support to schools: voices and perspectives of school principals in a province in South Africa. *International Journal of Leadership in Education*, *21*(6), 757-770. https://doi.org/10.1080/13603124.2017.1394496

Barger, M. M., Kim, E. M., Kuncel, N. R., & Pomerantz, E. M. (2019). The relation between parents' involvement in children's schooling and children's adjustment: A meta-analysis. *Psychological bulletin*, *145*(9), 855. https://doi.org/10.1037/bul0000201

Charles Sr, L. F., & Luard, M. L. (2018). Middle school teachers' perception of differentiated instruction on lower third student achievement. *Teacher Education and Curriculum Studies*, 3(3), 20-33.

Davis, F. (2019). *The little book of race and restorative justice: Black lives, healing, and US social transformation*. New York: Good Books.

de Jager, T. (2017). Perspectives of teachers on differentiated teaching in multicultural South African secondary schools. *Studies in Educational Evaluations*, 53, 115-121.

Denzin, N.K. & Lincoln, Y.S. (2008). *Paradigms and perspectives in contention.* The Department of Basic Education (DBE). (2010). National Policy for an Equitable Provision of an Enabling School Physical and Teaching and Learning Environment: Pretoria: Government Printers.

Dixon, F. A., Yssel, N., McConnell, J. M., & Hardin, T. (2014). Differentiated instruction, professional development, and teacher efficacy. *Journal for the Education of the Gifted*, 37(2), 111–127. https://doi.org/10.1177/0162353214529042.

Firmender, J. M., Reis, S. M., & Sweeny, S. M. (2013). Reading comprehension and fluency levels range across diverse classrooms: The need for differentiated reading instruction and content. *Gifted Child Quarterly*, *57*(1), 3-14.

Ginja, T. G., & Chen, X. (2020). Teacher Educators' Perspectives and Experiences towards Differentiated Instruction. *International Journal of Instruction*, *13*(4), 781-798.

Hair, J.F., Celsi, M.W., Money, A.H., Samouel, P. & Page. M.J. (2011). *Essentials of business research methods*. (2nd Ed). New York: Sharpe.

Hapsari, T., & Dahlan, J. A. (2018, May). Understanding and responding to the students in learning mathematics through differentiated instruction. In *Journal of Physics: Conference Series*, 1013, (1), 012136. IOP Publishing.

Heng, T.T., & Song, L. (2020). A proposed framework for understanding educational change and transfer: Insights from Singapore teachers' perceptions of differentiated instruction. *Journal of Educational Change*, (21)4, 595–622. https://doi.org/10.1007/s10833-020-09377-0

Ismajli, H., & Imami-Morina, I. (2018). Differentiated instruction: Understanding and applying interactive strategies to meet the needs of all the students. *International journal of Instruction, 11(3), 207-218.*

Khan, P., & Iqbal, M. (2012). Overcrowded classroom: A serious problem for teachers. *University of Science and Information Technology*, *49*, 10162-10165.

Lavania, M., & Nor, F. B. M. (2020). Barriers in differentiated instruction: A systematic review of the literature. *Journal of Critical Reviews*, *7*(6), 293-297.

Leinwand, S. (2014). Principles to Actions: Ensuring mathematics success for all. *Mathematics Teaching in the middle schoo*l, 19(9) 516-519.

Lim, W. M., & Ting, D. H. (2012). E-shopping: an Analysis of the Technology Acceptance Model. *Modern Applied Science*, *6*(4), 49.

Maphumulo, T.B. (2024). Draft unpublished PhD dissertation, submitted to University of South Africa.

Meier, C., & West, J. (2020). Overcrowded classrooms–the Achilles heel of South African education? *South African Journal of Childhood Education*, *10*(1), 1-10.

Melesse, T. (2015). Differentiated instruction: Perceptions, practices, and challenges of primary school teachers. *Science, Technology and Arts Research Journal*, *4*(3), 253-264.

Milligan, L. O., Koornhof, H., Sapire, I., & Tikly, L. (2018). Understanding the role of learning and teaching support materials in enabling learning for all. *Compare: A Journal of Comparative and International Education*. https://doi.org/10.1080/03057925.2018.1431107

Munje, P. N., & Mncube, V. (2018). T*he lack of parent involvement as hindrance in selected public primary schools in South Africa:* The voices of educators. https://hdl.handle.net/10520/EJC-11a610eb5

Mutambara, D., & Bayaga, A. (2020). Rural-based Science, Technology, Engineering and Mathematics teachers' and learners' acceptance of mobile learning. *South African Journal of Information Management*, 22(1), 1-10.

Ogunkunle, R. & Henrietta, O. (2018). Effect of differentiated instructional strategies on students' retention in geometry in FCT senior secondary schools, Abuja, Nigeria. Global *Journal of Educational Research*, 13(1), 1. https://doi.org/10.4314/gjedr.v13i1.1

Otani, M. (2020). Parental involvement and academic achievement among elementary and middle school students. *Asia Pacific Education. Review*, 21(1), 1–25. https://doi.org/10.1007/s12564-019-09614-z

Pozas, M., Letzel, V., & Schneider, C. (2019). Teachers and differentiated instruction: exploring differentiation practices to address student diversity. *Journal of Research in Special Educational Needs*, 20(3), 217-230. https://doi.org/10.1111/1471-3802.12481

Putra, G. S. (2023). The Misconception in Differentiated Instruction Practices: A Literature Review. *Open Journal of Social Sciences*, 11(1), 305-315.

Ramli, R., & Yusoff, N. M. (2020). Self-efficacy and differentiated instruction: A study among Malaysian school teachers. *Universal Journal of Educational Research*, 8 (4), 1252-1260. DOI: 10.13189/ujer.2020.080416

Riet, A. M. (2015). *The use of learning and teaching support material for classroom teaching: intermediate phase a study of four primary schools in Diepkloof, Soweto.* Doctoral dissertation.

Schoenfeld, A. H. (2010). *How we think:* A theory of goal-oriented decision making and its educational applications. Routledge.

Smets, W. (2017). High Quality Differentiated Instruction- A Checklist for Teacher Professional Development on Handling Differences in the General Education Classroom. *Universal Journal of Educational Research*, *5*(11), 2074-2080. Doi:10.121189/ujer.2017.051124

Suprayogi, M. N., & Valcke, M. (2016). Differentiated instruction in primary schools: Implementation and challenges in Indonesia. *Ponte Journal*, *72*(6), 2-18.

Terwel, J. (2005). Curriculum and curriculum differentiation. In J. Terwel and D.F. Walker (eds), Curriculum as a shaping force: *Toward a principled approach in curriculum theory and practice.* Hauppauge, NY: Nova science, 33 -50.

Thanh, N. C., & Thanh, T. T. (2015). The interconnection between interpretivist paradigm and qualitative methods in education. *American journal of educational science*, *1*(2), 24-27.

Tomlinson, C.A. (1999*). The differentiated classroom: Responding to the needs of all learners.* Alexandria, VA: Association for Supervision and Curriculum Development.

Tomlinson, C.A. (2001). *How to Differentiate Instruction in mixed-ability classrooms*. 2nd Alexandria: Association for supervision and curriculum development.

Tomlinson, C. (2004). Differentiation in diverse settings: A consultant's experience in diverse settings. *The school Administrator*, 7(61), 28-35.

Torrecilla, F. J. M., & Hernández-Castilla, R. (2020). Does parental involvement matter in children's performance? A Latin American primary school study. *Revista de Psicodidáctica (English ed.)*, 25(1), 13-22. https://doi.org/10.1016/jpsicoe.2019.10.002

Vygotsky, L.S. (1986). *Thought and language,* A. Kozulin, (Ed. and Trans.), Cambridge, MA.: MIT Press.

Waluyandi, F., Trihastuti, R., & Muchtarom, M. (2020). Implementation of parental involvement in learning civic education. *Budapest International Research and Critics in Linguistics and Education (BirLE) Journal*, *3*(4), 1686-1695.

Westwood, P. (2016). *What Teachers Need to Know About Differentiated Instruction.* Melbourne: ACER Press.