

## Perceptions of Grade 8-12 Mathematics Teachers on Learner Centred Education (LCE)

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### Abstract

The Ministry of Education, Arts and Culture (MEAC) in the Republic of Namibia advocates and encourages teaching in schools through Learner Centred Education (LCE). This call and expectation are evidenced in the vast number of school instructional leadership documents in favour of LCE including the Classroom Observation Instrument (COI), LCE policy [7] and the National Policy Guide for the Junior Primary Phase [15]. However, our 10 years of experience as mentor teachers of Junior Secondary Mathematics teachers suggests that a great number of teachers in schools, including recently trained Mathematics teachers, have a slanted notion of LCE and are subsequently confused as to how to apply this advocated approach in their Mathematics lessons. Thus, the focus of this research project. This research made use of two semi-structured instruments, questionnaires and interviews to explore perceptions of eight Grade 8-12 Mathematics teachers on LCE. All the participating teachers hailed from the two regions of //Kharas and Oshikoto, Namibia. The analysis of data suggests three conclusions with serious implications. First, teacher's training institutions only practice Teacher Centred Education (TCE). Second, the study also found that Grade 8-12 Mathematics teachers preferred TCE methods to teach Mathematics, in varying Namibian school situations such as large class groups, ill-disciplined learners and even gifted learners, as well as learners who were not eager to learn or ready to perform.

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However, sometimes TCE does not challenge slower learners to learn and/or think critically and logically. Third, it was found that Grade 8-12 Mathematics teachers needed further training on understanding and applying LCE, as well as training to use technology to teach some topics of Mathematics. Furthermore, the study strongly recommends immediate review of the LCE policy in Namibia.

**Keywords:** Grade 8-12 Mathematics teachers; perceptions; training; learner centred education; teacher centred education; methods; technology; Namibia.

## 1. Introduction

### 1.1. Background and literature of the study

After Namibia's independence in 1990, the Ministry of Basic Education and Culture introduced LCE so that learners could be the centre of the teaching and learning process [9]. The change was necessitated by the fact that teachers used to focus their teaching on so called "facts", rather than developing learner's thinking skills [2, 12]. In this study, LCE refers to "an approach to education in which the learners learn from the teacher, from one another, and on their own" Lynd [7, p. 13]. On the other hand, teaching that focuses on the transmitting of facts rather than learning with understanding is referred to as TCE. When using this approach, teachers use traditional teaching approaches to teach by rote learning [8]. In the same vein, Kapenda [6] opines that many teachers prefer traditional teaching methods over LCE in their teaching, due to a number of factors such as LCE being time consuming and experimental. This often then comes with a lot of challenges like classroom management, lack of discipline among learners, insufficient resources and overcrowded classrooms. The MEAC implemented a policy of LCE in order to improve the education system in Namibia and respond to learners' needs. There are numerous ministerial documents in support of LCE including the *National Curriculum for Basic Education* [11], and the *Promotion Policy Guide for Junior and Secondary School Phases* [12, 13, 14]. While LCE is the applied and preferred philosophy of teaching and learning in Namibia, it has not yet been successfully implemented as teachers are finding it difficult to employ. Boyadzhieva [4] suggests that the introduction of LCE across the globe is only partly successful, as the implementation of its approach is being seriously handicapped by national cultures. Namibia is not an exception in this case, as the implementation of LCE has not yet reached the desired point in schools due to numerous challenges such as overcrowded classrooms and lack of teaching-learning resources in schools [7]. Other challenges of LCE include teacher-learner power relations, the nature of the curriculum, teachers' substantive and syntactic knowledge and classroom organisation and management [3]. Mtitu [3] further mentions other constraints against the implementation of the LCE approach in teaching and learning such as language barriers, large class sizes, curriculum design, shortage of teachers and instructional resources, lack of both in-service training for LCE, cultural contexts and specific curriculum relevance. Alipio [5] however, does not agree with some of the factors suggested by other scholars as challenges hindering teachers from using LCE in teaching Mathematics. He states that teachers' professional experiences, as well as the type of teacher's training, do not affect the type of approach that teachers use in Mathematics classrooms – sometimes, some mathematics teachers simply prefer using both approaches, not only LCE methods. Thus, these mixed feelings Mathematics teachers have towards factors stopping them using, in particular, LCE in their teaching and learning has triggered this research to explore the perceptions of Grade 8-12 Mathematics teachers on LCE. While the use of LCE comes with a

number of challenges, it's use can be very beneficial. Lynd [7] indicated that LCE allow learners to learn better provided that they are given interesting learning activities, given opportunities to participate actively in the lesson and choose what content they want to learn, and when they are solving real problems as well as given chances to learn from one another.

A typical LCE lesson, is the one meeting some of the following features, Lynd [7]:

- the learners often work in groups, the teacher calls learners by name, and the teacher rarely lectures
- the learners talk much of the time, the teacher checks to be sure learners are learning, and learners discover things for themselves and learners learn to understand things, not just to memorize facts
- learners are actively involved in the lesson, provide ideas for lesson activities and teach other learners
- learners help organize the classroom, pass out books; the teacher asks learners about their experiences and feeling; and teacher and learners use conventional and new technology
- the teacher encourages trial and error learning and help learners when they make a mistake

### ***1.2. Statement of the problem***

According to our teaching experience as high school Mathematics teachers, we have noted with concern that LCE is not explicit to the majority of Namibia's teachers; the knowledge and practical application of LCE is a topic that no-one wants to bring up and none of the teachers we know, have a good working knowledge of LCE. In our own view, LCE as a policy and philosophy of teaching and learning in Namibia's schools is regrettably not well defined or contextualised for our teachers. Most teachers have little or no clue, what features of a lesson would merit using LCE in that lesson. Hence, as Mathematics experts with over a decade's experience, we decided to explore the perceptions of Grade 8-12 Mathematics teachers on LCE.

### ***1.3. Research goal and research question***

LCE is not a new concept and is found in most school curricula across Africa and the world, yet evaluating the effectiveness of this method has not been prioritised. Thus, the goal of this research remains: to explore perceptions of Grade 8-12 Mathematics teachers on LCE. This goal can only be attained if this study provides answers to the following research question: What are the perceptions of Grade 8-12 Mathematics teachers on LCE?

### ***1.4. Significance of the study***

The significance of this study is three-fold. First, to document and raise awareness among Mathematics teachers on the effectiveness of LCE policy in Namibia. Second, to make suggestions and review the LCE policy in Namibia, especially for the Mathematics curriculum at a secondary school level. Third, to propose in-service training of Grade 8-12 Mathematics teachers on effective use of LCE.

## **2. Methodology**

### ***2.1. Research Design***

This study is qualitative in nature. The study used questionnaires and one-on-one semi-structured interviews which are both qualitative approaches. We chose qualitative approaches so that we could get rich data and detailed understanding of the phenomena which is the perceptions of Grade 8-12 Mathematics teachers on LCE in the //Kharas and Oshikoto regions. The use of more than one method of data collection was necessary for us to be able to triangulate data and thus increase the reliability and validity of our research findings.

## ***2.2. Sample and sampling procedure***

This study employed non-randomised purposive sampling to select all eight Grade 8-12 Mathematics teachers in the //Kharas and Oshikoto regions. Our main selection criteria were that the participants had to be Mathematics teachers for Grade 8-12 with at least five years of teaching experience and be willing to participate in the study out of their own free will. Subsequently, all participants had teaching experience between 6-14 years. Gender balance and age did not form part of the criteria for the purpose of this study; hence we had five males and three female Mathematics teachers as research participants.

## ***2.3. Data collection procedures and research instruments***

This research made use of one-on-one semi-structured interviews and questionnaires respectively. The interviews and questionnaire used exactly the same questions. Therefore, by conducting the interviews first, it was hoped to avoid biased answers from participants, as they would not have any knowledge of the questions the researchers had prepared. This meant that their answers would be a true reflection of their thoughts and perceptions. The interviews were also the main source of data for this study. Both instruments made use of open ended and close ended questions [1].

## ***2.4. Data analysis***

The unit of analysis were written and verbal responses of participants collected using interviews and questionnaires respectively. All data were qualitative and thus were analysed using the inductive content analysis technique. The interview data were first transcribed verbatim and later colour coded and thereafter analysed using identified themes from the participants' responses. The analysis of data was presented using quotes and snapshots from verbal and written responses in the interviews and questionnaires respectively.

## ***2.5. Ethics statement***

Permission to carry out the study was granted by the Directors of the Oshikoto and //Kharas regions. Permission was sought from the offices of the Inspector of Education and School Principals responsible for the schools of the participating teachers. Thereafter, the participating teachers gave their consent in writing. Upon arrival at the schools, the researchers made arrangements with the participating Grade 8-12 Mathematics teachers to be interviewed and to complete questionnaires during their free time.

### 3. Results and discussion

The findings from the analysis of data suggest four main themes, namely: *LCE is not clear and is not implemented; teachers do not think highly of TCE even when using the approach; teachers' training only practices TCE; and Grade 8-12 Mathematics teachers have passion for teaching.* The first theme is presented using 9 sub-themes while the other two themes have no sub-themes.

#### 3.1. *LCE is not clear and is not implemented*

The main finding of this study strongly suggests that LCE is not a clear concept to the teachers. Teachers were asked first to define the concept LCE but seven out of eight teachers gave vague definitions. T1 described LCE as an approach where by “*a teacher facilitates*” while T2 and T3 described the approach as “*a method or system whereby a teacher interacts positively with learners through discussion and presentation*”. What is worrisome is that the descriptions by these three mathematics teachers seemed to fit the TCE concept. T1 failed to explain as to what exactly the teacher is facilitating in his explanation – whether instructions, learners’ activity, discussion or the learning process. T5, T6 and T7 also gave inexplicit and immeasurable descriptions of LCE. T5 and T6 described LCE as “*an instruction where learners are more involved in the class*”. T7 described this approach indirectly claiming LCE as when “*the child is at the centre of teaching and learning*”. To conclude, T4 gave a more convoluted definition defining LCE as “*a teaching approach that focuses less on the transmission of contents but rather more on learners and their own ability to discover things on their own or by themselves*”. The first part of the previous definition is very confusing: learners are *supposed* to learn the content and the emphasis of teaching *should* concentrate on learning mathematics content knowledge which is tested through various assessment forms. It is evident that Grade 8-12 Mathematics teachers lacked knowledge of the LCE concept and that it was not clear to them; they defined LCE as TCE and therefore this study concluded that the approach of LCE does not exist in these teachers’ classrooms. This finding strongly supports the cautions and ideas of [7,3,4] that LCE is a failure and not clearly understood. The following 9 sub-themes explain the vague understanding and non-implementation of LCE.

##### 3.1.1. *Lack of substantive knowledge of LCE concept*

The Grade 8-12 Mathematics teachers in this study demonstrated lack of substantive knowledge of the LCE concept except for T8. T8 described LCE as “*an approach whereby learners do research, discover, and are actively involved, eager to learn, ready to perform, learners initiate and do much of the talking*”. The part of this definition that shows understanding is T8’s inclusion of the conditions of an LCE approach, especially the behaviour of learners – these include discovering, researching, readiness and willingness to initiate and perform as expected. T2 supported these conditions of LCE when s/he indicated that “*LCE best suits a lesson where learners know the topic or at least they have the basic [prior knowledge]*”. In addition, when teachers were asked to recall and state the two principles of LCE, all eight teachers indicated strongly that they did not know. T4 placed it on record saying, “*I am not aware of the LCE principles*”. This subtheme supports the ideas of [7,3,4] that often teachers lack substantive knowledge of LCE.

### **3.1.2. Teacher-learners ratio remain a challenge**

One of the identified main challenges to employing LCE in the Grade 8-12 Mathematics classes was abnormal teacher learner ratios. All eight teachers indicated that they have over-crowded classrooms ranging between 33 and 46 learners per class. For instance, T2, T3, T4, T5, T6 and T7 indicated that teacher-learner ratio “*is not considered in our [their] situations as there are classes with 46 learners and it remains a challenge because a teacher cannot teach each learner and mark learner’s work or give feedback on time*”. T3 added that “*time allocated per lesson is very little*”. T7 added that “*it is always difficult to teach big classes in terms of classroom management, learner discipline, and overall subject administration*”. T5 used an analogy of how LCE may not work in their Mathematics classrooms when s/he suggested that using LCE in a class of 45 minutes with 45 learners “*means every learner per class has only one minute with the teacher*”. In this sub-section, we have presented limiting factors of why LCE is not effective or appropriate in the Namibian current education system, especially for Grade 8-12 Mathematics teachers. This sub-theme supports the ideas of [7,6,3,4] that abnormal teacher learner ratios can cripple implementation of LCE.

### **3.1.3. The topic or lesson dictates the teaching approach**

One of the interesting findings shows that Grade 8-12 Mathematics teachers do not use either TCE or LCE, but they combine both methods; they emphasised strongly that the methods used are always dictated by the topic, concepts, lesson or part of a lesson. For instance, T2 indicated that “*tough topics need lecturing methods [TCE]*”. T4 indicated that “*lecturing method is also useful as it helps to instil the basic understanding which is the fundamental of any knowledge*”. Six teachers T2-T6 and T8 suggested that “*the combination of the two methods is best. It all depends on the type of learners one has and also the topic*”. T6 indicated that “*one needs to do all methods in one lesson ... because even in an LCE lesson the learners are given instructions by a teacher*”. T2 supported the opinions of T6 adding that “*if learners ... intervene [in a TCE lesson] by asking questions, then it is likely to be a switch*”. T1 suggested that the use of both methods TCE and LCE was good because “*there are some topics in Mathematics that cannot be completely LCE. In some cases it might be 1:1 or 2:3 LCE to TCE, depending on the topic/concept the teacher is dealing with*”. T5 suggested that “*if you find that one method is not working then you switch to the other*”. T3 suggested that “*TCE is always needed at the beginning of the lesson to introduce a lesson and LCE is needed to give learners a chance to discuss and foster a collaborative approach to help each other*”. In addition, most teachers suggested that they would use the LCE approach as it allowed “*learners to express themselves, reflect and have control over their learning processes; to prepare our learners to learn to work independently; and make learners to think critically and logically rather than to be treated like empty vessels*” (T1 and T6). To conclude, T4 put it on record suggesting that “*the nature of the concept dictates the method*”. This sub-theme supports the ideas of [5].

### **3.1.4. Teaching of syllabus and not learners**

Another interesting and a slightly shocking finding suggests that some teachers opt to teach the syllabus and not the learners due to limited teaching time and overcrowded classrooms. For instance, T5 indicated that because there were “*not enough instructional materials, we only teach to finish the syllabus but we do not teach for*

*learners to understand*". This sub-theme supports the ideas of [7,6,3,4] that lack of instructional resources can cripple implementation of LCE.

### **3.1.5. TCE is for gifted learners and LCE is for slow learners**

When teachers were asked to share challenges when using either method, they gave contradicting views, with some teachers regarding TCE as sometimes only good for gifted learners and LCE as good for slow learners. For instance, T2 and T4 both agreed that *"only gifted learners benefit more from TCE and slow learners ... gain more from LCE"* ... *"slow learners tend to contribute nothing to teaching and learning"*. Some of the criticism laid against TCE included making *"learners lazy, bored, and dependent in life; not self-driven; and limit[ing] learners not to think logically and critically"* (T4 and T6). T1 suggested that s/he *"did experience the problem when I try to make lessons more learners centred, because learners are not used to it. Learners are more used to listening than doing. Learners have become dependent on teachers. And I believe that as teacher's, we have contributed"*. These findings suggest that gifted learners benefit more from TCE with limited development of their critical and logical thinking, as opposed to slow learners who are carried along by more gifted learners through LCE. This new finding needs to be verified with more data from different Grade 8-12 Mathematics teachers.

### **3.1.6. Distinction between LCE and TCE approach**

In addition to sub-theme 3.1.1 and 3.1.5, the analysis of data identified one key finding that Grade 8-12 Mathematics teachers do not make a clear distinction between LCE and TCE. For instance, when asked whether lecturing methods should be abandoned or not, T5 explained, *"no ways because no one said lecturing is LCE or TCE"*. T6 suggested that *"we should use LCE more than TCE because that will make learners think critically and logically"*. T7 and T8 both disagreed with T6 suggesting that *"it's often necessary to use more lecturing methods"*. Another example was when T3 enlisted TCE typical methods of *"discussion and presentations"* as examples of LCE methods. This confusion in this study once again proves beyond doubt that LCE is not clear and not explicitly understood by Grade 8-12 Mathematics teachers and therefore LCE is not an existing method of teaching. This sub-theme supports the ideas of [7,2,3,4].

### **3.1.7. Teachers need training on LCE**

One of the key important findings suggests that Grade 8-12 Mathematics teachers need training on using the LCE approach. For instance, T7 was very upfront and stated, *"I do have problems administering LCE because I am not properly trained on how to prepare a LCE lesson and because of disciplinary problems at school"*. T7 indicated that it was not always possible to have a lesson that is completely LCE adding that *"in the Namibian setup first teachers need to be trained on how to set up a complete LCE lesson"*. T7 planned to study soon to become empowered *"on how to prepare and facilitate a LCE lesson"*. This indeed shows that the teachers lack knowledge and skills on LCE. There are many other reasons suggested by participants as to why LCE will always be impractical in Namibia. T7 and T8 indicated that LCE will always be impossible because of a *"high number of shy learners [who] are passive and not eager to learn; learners [that] can't express themselves in a*

*Mathematics language; lack of textbooks, chairs, financial and teaching resources; equipment; and bigger class groups*". This sub-theme supports the ideas of [7,3,4] that a lack of training on LCE can cripple implementation of LCE. This disagrees with the ideas of [5] as stated earlier.

### **3.1.8. Teachers need training and provision of technology**

To overcome the challenges of teaching overcrowded and large class groups, two teachers (T1 and T4) suggested that they needed training and schools should provide the technology necessary to teach Mathematics effectively. For instance, T1 suggested that *"it will be very effective if we can be provided with interactive whiteboards so that we can arouse the interest of learner's with slides etc"*. T4 opined that *"in mathematics there are some chapters that can be best taught by means of a smartboard or audio visual and projector. However I need to be trained on how to use such teaching aids"*. This sub-theme also disagrees with the ideas of [5].

### **3.1.9. Suggested methods of using LCE and TCE effectively**

The participating teachers suggested a number of methods to help teachers use TCE or LCE methods effectively and these are stipulated in this snapshot:

*T1: By encouraging teachers to allow learners to work independently and also encouraging learners to embrace a culture of self-learning and discovery;*

*T2: Group learners based on their ability.*

*T3: Evaluate the nature of the topic. Research more on the topic and implement the best method.*

*T4: By using both methods and by assessing which method is appropriate for each concept.*

This sub-theme supports the ideas of [5].

### **3.2. Teachers do not think highly of TCE even when using the approach**

A second theme identified through analysis of data in this study shows that even though Grade 8-12 Mathematics teachers were in favour of using TCE methods to teach Mathematics effectively, they do not think highly of it. For instance, they all related TCE as just talking more. T6 and T8 described this approach as *"an approach whereby the teacher does the most talking, the teacher give and do all the explanation, and teacher spoon feed."* T7 think of TCE as *"more teacher-centred with less emphasis on a learner's creativity and initiative; and learners listen and copy notes"*. T5 defined TCE as *"an instruction where teachers do everything in the classroom i.e. lecturing, demonstration etc"*. T4 defined TCE simple *"a teaching approach whereby the teacher is viewed as the only source of knowledge and he/she has transfer whatever understanding and learners are just there to receive from the teacher"*. Moreover, in sub-theme 3.1.5, it was well articulated how TCE was thought to be for gifted learners. Under the same sub-theme, teachers complained of having problems



implementing LCE methods, especially teaching large class groups and ill-disciplined learners. In connection with the first theme, this study concludes that TCE can be an effective and appropriate approach to teach large class groups; ill-disciplined learners; and even gifted learners as well as learners who were not eager to learn or ready to perform in the current Namibia set up. This theme supports the ideas of [6].

### **3.3. Teacher's training only practices TCE**

One of the new and key findings suggests that teacher's training institutions are not preparing teachers to use LCE in schools but rather heavily emphasise the practice of TCE. The analysis of data shows that seven out of eight teachers strongly opine that teacher's training institutions are not preparing teachers to use LCE in schools. For instance, when teachers were asked whether they "*think training institutions are preparing teachers enough to go use LCE in schools?*", T2, T3 and T6 placed it on record by stating the following. T3: "*No. To be honest, they are not at all. They are not*". T6: "*No, they don't because teachers do not do much practice and there are no learners there. They just preach but they don't really prepare as they don't do it practically*". T2: "*For me, I will say no because ... the way they present their presentations is not LCE or let me say student centered. On theory, it is there in books that we should use LCE but the lecturers are actually practicing TCE only*". T1 also felt that LCE was not being practiced at training institutions "*because in order for you to apply LCE effectively you must know the methods but most of the new teachers are not applying it. Maybe they know it but they don't apply it*". These quotes equivocally support the ideas that training institutions only practice TCE and they are not preparing Grade 8-12 Mathematics teachers to use or implement LCE in their lessons. This theme supports our observations and the ideas of [3].

### **3.4. Grade 8-12 Mathematics teachers have passion for teaching**

All eight participating teachers indicated that they have a passion for teaching Grade 8-12 Mathematics. For instance, T1 and T8 indicated that they "*have a passion for the subject*". There were many reasons for them having a passion. T5 and T6 indicated that they "*like the subject and enjoy teaching math [because] teaching math is fun; teaching mathematics motivates and encourages or develops learners to think critically and logically*". T4 indicated that s/he loved teaching mathematics because of having "*good knowledge in teaching the subject*". Their passion can be attested to by two factors, namely: first, with conviction all of them are not going to quit teaching; second, their achievements of good academic performances. For instance, all eight teachers had received numerous merit awards "*at circuits and regional levels for always achieving above average results or even obtaining 100% pass rates in Grade 10 and/or 12 Higher Level*". This new finding supports the ideas of [7,3,4].

## **4. Conclusion**

This study made three important conclusions. First, LCE encounters serious difficulties when large class groups are being taught; it is also difficult when learners are ill-disciplined and when learners are not ready to perform or eager to learn. Therefore, the study strongly suggests that Grade 8-12 Mathematics teachers need immediate training on understanding and applying LCE methods, as well as training to use multimedia and audio visual

technology to teach some topics of Mathematics. Second, while TCE may sometimes not challenge slower learners to grasp concepts and/or think critically and logically, it was found that TCE is the preferred method of teaching Grade 8-12 Mathematics in varying Namibian school situations, such as large class groups, ill-disciplined learners, gifted learners, as well as learners who are not eager to learn or not ready to perform. Third, teacher's training institutions are not preparing new Grade 8-12 Mathematics teachers to use and/or implement LCE in their lessons.

## **5. Recommendations**

The study makes five important recommendations. First, more research is needed to evaluate the effectiveness of LCE and subsequently review the LCE policy in Namibia. Second, teacher's training institutions should start practicing LCE when training new Grade 8-12 Mathematics teachers and not place most of its emphasis on the use of TCE. Third, there is a need for immediate training on the use of technology during mathematics lesson by Grade 8-12 Mathematics teachers in service. Four, there is a need for immediate training of in-service Grade 8-12 Mathematics teachers and Mathematics teacher educators on effective and efficient use of TCE methods, as there is much in this approach to benefit Namibian school children. Finally, there is a need for further and immediate research and training for Grade 8-12 Mathematics teachers to explicitly unpack the concept, application and existence of LCE.

## **6. Limitations**

One of the limitations of this study is that the participants were only mathematics teachers, and therefore results might be different if other subject teachers were interviewed. Another limitation is finance that we could only afford to interview eight teachers and this small sample might have influenced the findings of the study such that findings does not represent ideas of the entire population.

## **Acknowledgements**

We would like to thank all teachers who freed themselves to participate in this study and hence made this study possible.

## **References**

- [1]. A. De Vos, H. Strydom, C. D. Fouche, & C. S. L. Delport. Research at grass roots for the social sciences and human services professions (3<sup>rd</sup> ed.). Pretoria: Van Schaick, 2005.
- [2]. D. Wolfaardt. Curriculum development and practice. University of Namibia, Windhoek: Centre of External Studies, 2012.
- [3]. E. A. Mtitu. "Learner-centred approach in the teaching in Tanzania: geography teachers' perceptions and experiences." Doctoral thesis, Victoria University of Wellington, Wellington, 2014.
- [4]. E. Boyadzhieva. "Learner-centred teaching and learner autonomy," presented at International Conference on Teaching and Learning English as an Additional Language, Antalya, Turkey, 2016.
- [5]. J. Alipio. "Learner – Centred Approach in the Teaching of Mathematics: A Consideration of Teachers'

- Perceptions.” Doctoral thesis, University of Zululand, Richards Bay, 2014.
- [6]. M. H. Kapenda. “Translating policy into practice: Aspects of learner-centred classroom practice in mathematics in Namibia secondary schools.” PhD thesis, University of Western Cape, Cape Town, 2008.
- [7]. M. Lynd. *Learner-centered education: Teachers basic competencies manual (module 3)*. Okahandja: NIED, Ministry of Basic Education and Culture, 1996.
- [8]. M. N. Amutenya. “Active learner participation: A study of the BETD INSERT teacher’s classroom practices in the Ondangwa east & west regions.” Master’s thesis, University of Namibia, Windhoek, 2002.
- [9]. Mathematics and Science Teachers Extension Programme (MASTEP). Teaching methods for mathematics module 2. Windhoek: Centre of External Studies, University of Namibia, 2002.
- [10]. Namibia. Ministry of Education, Arts and Culture. Junior secondary phase: Mathematics syllabus Grade 8-9. Okahandja: NIED, 2015.
- [11]. Namibia. Ministry of Education, Arts and Culture. National curriculum for basic education. Okahandja: NIED, 2016.
- [12]. Namibia. Ministry of Education, Arts and Culture. Promotion Policy Guide for Junior and Secondary School Phases. Okahandja: NIED, 2010.
- [13]. Namibia. Ministry of Education, Arts and Culture. Promotion Policy Guide for Junior and Secondary School Phases. Okahandja: NIED, 2015.
- [14]. Namibia. Ministry of Education, Arts and Culture. Promotion Policy Guide for Junior and Secondary School Phases. Okahandja: NIED, 2018.
- [15]. Namibia. Ministry of Education. The national curriculum for basic education. Okahandja: NIED, 2014.