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PRESENTATIONS

P5. ELEMENTARY SCHOOL PRINCIPALS' PERCEPTIONS ABOUT INCLUSIVE EDUCATION WITH SPECIFIC REFERENCE TO GIFTEDNESS

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ABSTRACT

In recent reports by many task teams in South Africa inclusivity is now fore-grounded, and giftedness is identified as one of the 'exceptionalities' that need addressing. School principals' perceptions regarding the inclusion of students considered gifted are critical given that research confirmed instructional leadership as having the greatest impact on student outcomes. This study examined elementary school principals' perceptions, regarding the inclusion of learners considered gifted. Twenty principals of selected primary schools were interviewed, and their responses were thematically analysed. The results show that principals perceived inclusive education as meant for learners with learning barriers that and such learners needed to be supported at all costs. They perceive inclusive education as achievable through mixed ability grouping. However, when we probed the mixed grouping further most school principals perceived gifted students as teachers' assistants. We found these views to be problematic in that gifted students do not grow to their full potential under such circumstances.

INTRODUCTION

South Africa got its first democratic government in 1994. During the period 1994 - 2010 one would not be making a case for gifted education because, like anywhere else in the world, the concept of giftedness was viewed as elitist given the historical background of apartheid. This perception lead to the dismantling of the infrastructure created by the previous government, evidenced by (a) the closing of out-of-school centres which were established for the gifted during the 1980s (b) the withdrawal from schools of specialist gifted teachers and their redeployment elsewhere and (c) a general lack of interest among education authorities (Kokot, 1998:58). It can be summarized that since 1994, the focus for the South African education system moved from separate and specialized education for learners who are gifted to inclusive education with all learners being educated in mainstream schools and classrooms (Kokot, 2005). Since 2010 the landscape has changed and today, one is able once more to research and speak about gifted education without activating the notion of elitism but inclusiveness. This change of heart came about as a result of observations made by several task teams that have been appointed to investigate several challenges the country was facing. For example, in 2010 the then president of South Africa Mr Jacob Zuma established the National Planning Commission

“to take a broad, crosscutting, independent and critical view” of the challenges and opportunities that were facing South Africa. In their diagnostic overview the commission identified education as one of the most pressing challenges facing the country (NPC, 2010). The commission concluded that the net effect of the myriad of problems results in a system that is not able to produce the number and quality of graduates demanded by the country. With specific reference to gifted students the NPC (2011) acknowledged that gifted learners were a critical component of the country’s capability which the education system has neglected for decades. More recently the NPC recommended that opportunities for excellence be provided to the most talented students (NPC, 2012). In the pre-ambule of the National Development Plan - Vision 2030; the NPC envisages a South Africa where “we participate fully in efforts to liberate ourselves from the conditions that hinder the flowering of our talents” (NPC 2012). The plan goes on to state that schools are where talent is identified, career choices made, and habits learnt

Following the recommendations made by the NPC another task team was appointed by the Minister of Basic Education to investigate the implementation of Maths, Science and Technology Education (MSTE). Their findings were that often, provincial education departments seem to focus on under-performing schools to the neglect of gifted learners and learners with MST potential. Their recommendations were that (a) MST talent development programmes should be incorporated into the revised national MST strategy (b) at least one dedicated Math and Science Academy or a special Mathematics, Science and Technology School should be established in each province (c) the school should preferably be a boarding facility to accommodate learners and teachers from across the province and (d) the schools should be managed nationally (DBE, 2012:48)

Another recommendation from the Department of Science & Technology (DST) report was that vigorous mathematics talent searches needed to be made at school level particularly from the rural areas where there is a huge reservoir of untapped talent. The focus on rural areas is also justified when one considers that existing social and economic forces assure that the nation’s best students continue to become more concentrated in the elite schools and this is not consistent with the country’s democratic values.

All these recommendations emerge from a realization that our collective failure to prioritize the development of our most talented students could be one of the major reasons why there is a crisis in the education system. Today the closure of the centres for the gifted in South Africa after 1994 is widely regarded as detrimental to the nurturing of the gifted child and that the decisions to dismantle gifted education were misguided and counterproductive.

STATEMENT OF THE PROBLEM

Recent reports by many task teams in South Africa showed that schools present an environment that fails to meet the needs of gifted students. In most of the task-teams’ recommendations, inclusivity is now fore-grounded, and giftedness is identified as one of the ‘exceptionalities’ that need addressing. One of the key actors in the implementation of these recommendations is the school principal and their perceptions about inclusive education are critical given that research confirmed instructional leadership as having the greatest impact on student outcomes.

PURPOSE STATEMENT

Although educational literature shows that the school principal is the central figure in implementing change in schools, literature and research that directly links school principals to the enactment of inclusive instructional practices in the classroom is insufficient (Edmunds & Macmillan, 2010). With this background the purpose of this study was to examine elementary school principals' perceptions, regarding the inclusion of learners considered gifted.

RESEARCH QUESTIONS

The following research questions were raised:

1. How do principals view inclusive education?
2. What types of inclusive practices are being used at the targeted schools?
3. To what extent do these practices meet the needs of gifted students

WHY ELEMENTARY SCHOOL PRINCIPALS

In deciding to focus on the elementary school principals, this study considered the controversy that arises over when gifted programs should begin. Some researchers suggest identifying gifted students as early as pre-kindergarten (Gagné 2015) while others suggest delaying structured enrichment until at least Grades 3 or 4 (Rogers 1991). The idea of delaying identification is supported by evidence especially in the case of gifted students from disadvantaged backgrounds where it has been observed that many standardized tests used for identifying gifted students have a high language and cultural loading, which often negatively impacts performance in students of poverty or diversity who have less background knowledge or access to educational experiences (Benson, 2003; Ford, 2004). The under-representation of low-income, second language learning, and culturally diverse students in gifted and talented programs has led some researchers to argue that giftedness cannot be ascertained until third grade suggesting that it is better to wait until third or fourth grade to identify gifted students (Silverman, 1992). Early interventions before middle school and high school are commonly recommended as the most powerful strategies to prevent students from dropping out, which in turn prevents disengagement (Hupfield, 2007). It is against this background, that the study focused on elementary school principals.

THEORETICAL FRAMEWORK

Grant & Osanloo (2014), defined a theoretical framework as the foundation from which all knowledge for a research is constructed. It serves as the structure and support for the rationale for the study, the problem statement, the purpose, the significance, and the research questions. Hence a research without a theory will expose one to problems of not getting to the end as there would be no frame on which the study holds. This paper borrowed from two complementary theories i.e. Gagné's framework on how gifts develop into talents as well as Bandura's self-efficacy theory.

We provide some elaboration of those two theories starting with Gagné's work. While there are several influential theories and models in the field of gifted education, Gagné's (1999) model is among the top six that have been considered dominant in affecting international classroom practice. The model has received worldwide recognition because it is generally viewed as resolving the controversies that the gifted field has struggled with for years (Pfeiffer 2013). In 1985 Gagné first conceptualized his theory of talent development which he first named as the Differentiated Model of Giftedness and Talent (DMGT). Over three decades since its inception Gagné made further refinements to the model resulting in what he now calls the Comprehensive Model of Talent Development (CMTD) (Gagné 2015). Essentially, Gagné has been dissatisfied with the frequent, all-encompassing and interchangeable use of the terms gifted and talented. He argued that the 'one term fits all' use of gifts and talents was inaccurate, misleading, and detrimental to all efforts to identify and nurture talent, because it suggests that talents are inborn hence there is no place for systematic training, learning or practicing.

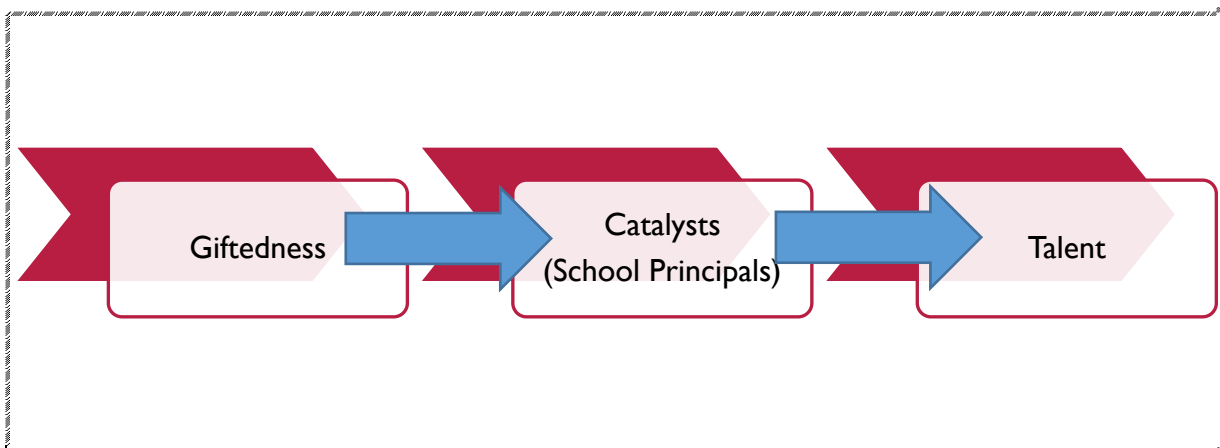


Figure 1 Modified model for understanding the school principal's catalytic role in the talent development process.

In his model Gagné (2015) uses the term 'giftedness' to refer to the outstanding natural abilities or aptitudes—the emerging form or potential; while the term 'talented' is used to refer to the outstanding mastery of systematically developed competencies or performance. An underlying principle of Gagné's view is that while high ability (talent) has some genetic basis (giftedness), learning, practice, and environmental factors are necessary for the emergence and development of such talent. An important implication for the field of gifted education is that although the path to outstanding performance may begin with demonstrated potential, the talent associated with giftedness must be developed and sustained by way of training and interventions in domain specific skills (Lubinski 2010). This developmental process is continually modulated by two large sets of catalysts which are intrapersonal and environmental. The intrapersonal factors include the physical and mental wellbeing of the gifted student and the environmental factors include the infrastructure, the people and the resources that can support or hinder the talent development process. These catalysts are critical in activating the translation of giftedness into talent. What makes Gagné's model particularly relevant for this paper is the place given to learning within the developmental process. Learning implies a role for the school principal as an important catalyst in the developmental process of gifts into talents. In the diagnostic overview of the National Planning report (NPC, 2010) it has been reported that where performance has

improved in schools in poor communities, the presence of a good school principal is critical. Good principals run efficient and disciplined schools, support their teachers, mentor less-experienced staff, involve parents in the education of their children and constantly seek opportunities to promote their schools.

This paper argues that school principals' perceptions contribute to how they act towards gifted students and the support they need, and this is where Bandura's theory comes in. Eggen & Kauchak (2014) define perception as the process people use to find meaning in stimuli. Similarly, Wey, Reddy & Rhodes (2014), view perception as the term used to describe the way people interpret objects and events, and it is being influenced by people's dispositions and expectations. Bandura (1994) defined self-efficacy as the perception of one's own ability to reach a goal. He went further to say that self-efficacy derives from people's beliefs about their capabilities to produce designated levels of performance that exercise influence over events that affect their lives. By determining the beliefs, a person holds regarding his or her power to affect situations, it strongly influences both the power a person actually has to face challenges competently and the choices a person is most likely to make. According to this theory, of all the thoughts that affect human functioning, and standing at the very core of social cognitive theory, are self-efficacy beliefs, "people's judgments of their capabilities to organize and execute courses of action required to attain designated types of performances" (Bandura 1977: 391). Self-efficacy beliefs have a major influence on future success because they lead to action or inaction (Bandura, 1993; Dweck, 2008). This suggests that we can infer action or avoidance of gifted students by studying school principals' perceptions about gifted students. Bandura postulated that self-efficacy expectations are a crucial consideration because they influence whether an individual will undertake the exploration of a domain of activity (approach behaviour) or avoid exploring that domain (avoidance behaviour). Other researchers (see Pajares 1996) further argued that self-efficacy beliefs are predictive of three behaviours (a) choice (approach vs avoidance) (b) rate of performance and (c) persistence or expenditure of energy. Much empirical evidence now supports Bandura's contention that self-efficacy beliefs touch virtually every aspect of people's lives—whether they think productively, self-debilitatingly, pessimistically or optimistically; how well they motivate themselves and persevere in the face of adversities; their vulnerability to stress and depression, and the life choices they make (Redmond, 2010).

We saw complementarity in the sense that in Gagné's work we saw school principals acting as catalysts in the developmental process of gifts into talents whereas in Bandura's work school principals' perceptions can hinder or support this developmental process.

METHODS

According to de Vaus (2005) the way in which researchers develop research designs is fundamentally affected by whether the research question is descriptive or explanatory. De Vaus argued that social researchers ask two fundamental types of research questions i.e. (a) What is going on? (Descriptive Research) or (b) Why is it going on (Explanatory Research). In this study the researchers wanted to examine the principals' perceptions about inclusive education and the support given to gifted learners in the regular classroom i.e. what is going on. Hence this study fits well within the Descriptive Research category. The descriptive research attempts to describe, explain and interpret conditions of the present i.e. "what is". The purpose of a descriptive research is to examine a phenomenon that is occurring at specific places and time.

The value of descriptive research in education is based on the premise that problems can be solved, and practices improved through observation, analysis and description. Descriptive research does not fit neatly into the definition of either quantitative or qualitative research methodologies, but instead it can utilize elements of both, often within the same study. Hence descriptive research generates data, both qualitative and quantitative, that define the state of nature at a point in time (Koh & Owen, 2000). It is against this strength to generate both quantitative and qualitative data that a descriptive approach was considered appropriate for this study. We interviewed twenty principals of selected primary schools around Bloemfontein. We were particularly interested in the types of inclusive practices that were being used at the participating schools.

FINDINGS

From the thematic analysis of the respondents three themes emerged regarding principals perceptions about inclusive education.

Inclusive education is for learners with barriers

The following four principals with different codes for identification, seem to understand that inclusive education is meant for learners with learning barriers that need to be overcome, and such learners be supported at all costs.

PT: inclusive education is very much important in many schools because it deals with problems or barriers learners are having so that they should be overcome.

PV: I think inclusive education is a great initiative that the Department of Education has established to assist the learners with barriers to learning.

PG: Inclusive education is important at schools. It has been meant for certain learners but, up to so far, it's still working fine. If a learner has got some problems regarding the work that has been done, then with inclusive education, we, as teachers, are able to at least reach out for those learners. I don't know if our government can at least extend the inclusive education to high schools because it is applied to primary schools only. Secondary schools need it because we still have learners battling with their studies there. No one is catering for them, in terms of trying to reach out to them. PG further raised his concern of the learners who are struggling at secondary schools as they are not catered for, that is, in terms of reaching out to learners with barriers.

PB: I view it as part of curriculum that is based on learners with learning barriers as well as learners who are normal. These learners with learning barriers are learners that need to be given more support at all costs based on their cognitive level of education. Although 17 principals acknowledge the provision made by the department to help teachers to push the gifted to perform to their full potential in regular classrooms, five of them have different opinions:

Inclusive education is for all learners

Twelve principals viewed inclusive education as education that caters for the needs of all learners in a classroom, irrespective of their barriers, abilities, disabilities, gender, race and

culture. It is also viewed as education that is not discriminative but equally valuing all learners. For example, here is what one principal said:

PA: Inclusive education under the South African conditions it is a good thing since we have 2 extremes, we have a side of children that are gifted or middle gifted and we have those children that are struggling quite a lot. It is only good because economically, I don't think South Africa can afford to actually build a lot of schools for children that are struggling, children that really need or require more attention. So, it can only serve the system good to have all the children under 1 roof so that they can also acquire the same type of education. Even though sometimes those discrepancies will actually tell in the future because the ones that are struggling are holding the ones that are gifted a little bit backwards.

What grouping strategies were encouraged

The results show that principals perceived inclusive education as consisting of mixed ability grouping. However, when we probed the mixed ability grouping further most school principals perceived gifted students as teachers' assistants.

PD: It doesn't mean you as a teacher have to stand in front of the learners and teach all the time, whereas there are those learners who have potential who are be able to assist one another. So, you give them a chance to do that and by so doing they gain more information and they become confident within themselves. We give them a chance to assist one another and make groups where they will lead such groups because sometimes learners learn more when they work together. As a teacher you just monitor all their work and go around the class and make sure that whatever work you've given them is carried out.

We found this to be problematic in that gifted students do not grow to their full potential under such circumstances

CONCLUSION

Generally, our findings suggest that school principals do not view gifted students as needing support. Research has shown that attitude toward gifted learners may be an indicator of the actual classroom experiences provided by teachers and school principals of gifted students within the regular classroom. An implication for practice is that for school principals to be able to meet the needs and maximise the potential of gifted learners, it is imperative that teacher training in gifted education begin at pre-service level and that practicing teachers and schools' principals are given the opportunity to engage in current, research-supported professional development (Kylie, 2013). Other researchers in the field of giftedness have also found that the quality of teacher preparation is critical, because it can transform teachers' including school principals' preconceived ideas of giftedness (Gagné 2015).

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**P8. CAREER GUIDANCE STRATEGIES TO CURB GIFTED LEARNERS
WHO ARE AT RISK OF DROPPING OUT OF PRIMARY SCHOOLS AT
MALUTI-A-PHOFUNG MUNICIPALITY AT FREE STATE PROVINCE IN
SOUTH AFRICA**

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ABSTRACT

Across time and globally literature viewed gifted students as an outstanding population existing of high intellectual abilities and excellence in other fields. However, in South Africa gifted learners dropping out of school seem to be a common burden which cuts across all of them. Thus, there is no consensus why gifted learners are dropping out unless if we investigate. The paper is a work in progress seeking to investigate whether or not counselling strategies exists to reduce gifted dropout rates in primary schools in Free State Province. Both stratified sampling and purposive sampling will be adopted. A population of teachers and learners from 6 primary schools with a sample of 12 Grade 3-4 teachers and learners will be interviewed. Structured questionnaires shall be administered to teachers. Therefore, finding ways to minimize school dropout must play a central role in any serious effort to reach the goal of education.

Keywords: Counselling, Gifted Dropouts, At-risk Students, Free-State Province in South Africa

INTRODUCTION

Bandura (1997) postulates that self-efficacy, is the motive behind learner motivation and engagement. Yet, teenagers dropping out of school before completion have been a global challenge for educators, parents, and employers for at least thirty years now. Similarly, South Africa is no exception to this challenge. According to the South African Schools Act (Act 84 of 1996, Section 3[1]), it is postulated that it is of course the right of each and every single child within the South African domestic residences to attend school from the first school day of the year up until the learner reaches seven years of age to the last day of the year by the age of fifteen or grade nine. Even though this ministry of education seems to be compulsory from the first grade up until the ninth grade.

It is however, evident that South Africa is extremely burdened with a crisis of high dropout rates (Grossen et al., 2017). Moreover, this pattern prevails across each and every province whereby the dropout rate has reached the highest rate of 54.4% within the Northern Province. Yet, School dropout is considered these days as perhaps the most important, if not the ultimate, aspect of wastage in education (Burrus & Roberts, 2012) because dropouts cost the nation billions in lost time, lost wages, lost taxes, and lost productivity. Therefore, finding ways to minimize school

dropouts must play a central role in any serious effort to reach the goal of Education for All (EFA).

STATEMENT OF THE RESEARCH PROBLEM

The vast majority of both elementary and secondary school counselors today are unaware of the unique guidance and counselling needs of the gifted and talented students they serve and are unable to provide the types of specialized services that these students require. Moreover, no known studies in South Africa have been done on gifted learners who are at a risk of dropping out of school from local or national levels (Ozcan, 2017). However, in order to curb gifted learner dropouts from the South African schools, we need to better understand why gifted learners are leaving school and what effective approaches may be employed in retaining them (Duckworth, 2016).

THE PURPOSE OF THE STUDY

According to Ozcan (2017) various studies have been carried out on gifted education in different countries, including Turkey and South Africa. Most of these studies placed focus on the perceptions of teachers of the education of gifted students and services for families (Baglama & Demirok, 2016; Oswald & De Villiers, 2013; Pomortseva, 2014). However, the number of studies focusing on career counselling of gifted students at risk of dropping out is limited in the literature (Ozcan, 2017). It is therefore expected that the present study might provide preliminary results for the South African country on career counselling of the gifted at risk. In this regard, the focus of this study is on the use of counselling strategies to lower / reduce gifted dropout rates in some selected primary schools in the Free State Province. The study is guided by the following Research Questions:

1. What counseling strategies exist in the participating schools?
2. To what extent do these counselling strategies meet the needs of at risk gifted learners?
3. How could these counselling strategies be enhanced to lower /reduce gifted dropout cases in the selected primary schools?

THE GIFTED DROPOUT

Although much of our collective attention and dropout prevention efforts have focused on those failing to master basic academic skills, the problem of gifted and talented dropouts has not been given similar attention (Robertson, 2006). Yet many reports such as (Renzulli & Park, 2000; Robertson, 1991; Solorzano, 1983) concur that approximately 20% of the high school students that dropout, are gifted. Unfortunately, this lack of investment in talented students is surprising, given that our education system's task is to develop the potential, dignity, and gifts of all our children, those who are gifted and those with special needs; those who are exceptional at academic work and those who struggle with their studies; those whose gifts lie in athletics, music, and art, and on and on. According to literature, intelligence is seen as an important national and international human resource and a possible vehicle for the advancement of the society as a whole. From this point of view, effortful educational investments by the society for

the benefit of gifted and talented children, should be made for the benefit of society itself (Reis, 1989; Hunt, 1995; Hernstein & Murray, 1994). Similarly, gifted students have a great potential for success since they contribute positively towards society. However it is of utmost importance to take their curricular, social and emotional needs into consideration (Landis & Reschly, 2013). Consequently, Majority of gifted Students who dropout encounter negative life outcomes, problems, lower earnings, government assistance (Shaw & Tallent-Runnels, 2007). In South Africa the vast majority of learners coming from low socio-economic status families at above almost 75% seem to be exposed to schools that offer poor quality education, schools that continually persist to perform poorly in the NSC which in turn, places them under a huge risk of dropping out of school (Branson et al., 2013). Therefore, due to their unique needs and characteristics, they deserve to be provided with suitable curriculum and appropriate support (Kearney, 1993; Eyre, 2004).

Unfortunately in South Africa there is poor quality of education due to teachers who lack basic content knowledge and pedagogical skill in subjects they teach (Spaull, 2015; Renzulli & Park, 2002) as well as numerous factors which includes congested classroom sizes that contribute towards difficult teaching (Gustafsson, 2011), and the majority of public schools which encounter scarcity and unavailability of enough resources (desks, chairs, textbooks etc) thereof (De Witte et al., 2013). Additionally, from as early as elementary school student's tendency to dropout were associated with teacher's ignorance and harassment of gifted students (Thorp, 2004, Klavir, 2008). Conversely, this outstanding creation is perceived to be more intellectually, emotionally, and behaviorally advanced and mature than the typical students (Berman, Schultz & Webber, 2012; Maxwell, 2007) and assumed to need little guidance in a broad range of career planning and exploration (Greene, 2006; Maxwell, 2007). It is however, for this reason Jung (2014) contends that the special needs of the gifted and talented seem to be hugely unrecognized and unaccommodated in the development and implementation of career education programmes.

WHY FOCUS ON AT RISK STUDENTS

A student at risk of dropping out is described as one who exhibits several of the characteristics associated with dropout students and who is unlikely to complete school (Christenson & Reschly, 2012). Additionally, for decades dropout has been viewed as a process of disengagement and withdrawal that occurs over many years. However, (Dockery N.D.; Hammond, 2007 Wallace, 2016) contends that misbehavior, early aggression and delinquency at school are seen as the warning signs for disengagement which contribute towards academic struggles and grade retention. Literature argues that a relationship can be identified between International and domestic literature on school dropout. Thus, over the past few years, researchers have identified certain cognitive, emotional and behavioral characteristics allowing the identification of students at risk of dropping out. These characteristics according to Burrus and Roberts (2012), involve lack of engagement with school, truancy, learners feeling bored at school, lack of interest in the classroom, tests seen as difficult, poor grades, learners coming from low income families, lack of parental involvement and support etc. According to the South African literature Hartnack (2017) avers that poverty is a factor towards learner dropouts in school which is seen as the final stage of cumulative process of disengagement (Hanover, 2015;

Mastrorilli, 2016). Since these learners, because of being unable to afford to enroll themselves early enough into schools. They end up attending school at a later stage (Brandson et al., 2013). Parent's educational level is also considered to be one of the major aspects associated with dropout risks, simply because literature suggests that the more educated parents are, the more they are likely to encourage their children positively towards their education (Duchesne et al., 2009; De Witte et al., 2013). However, if parents are illiterate, they are less likely to display a positive influence towards their children's education (De Witte et al., 2013). Unfortunately, literature contends that the South African Basic Education provides poor quality education which affects the performance of many pupils more especially those coming from disadvantaged families

THE IMPORTANCE OF COUNSELLING

It is very unfortunate seeing how the developmental and emotional needs of gifted students at risk of dropping out are often overlooked, since they are perceived to be meeting or exceeding academic expectations (Fisher & Kennedy, 2016). However, Oliha and Audu (2014) are of a view that counselling strategies should be used order to curb learner dropout. In this regard, they refer to counselling as a face to face communication that involves an individual and a trained counsellor towards provision for professional guidance in decision making particularly in emotional-situations. Moreover, Tinto (1975) postulates that counselling is a factor towards shaping learners at risk of dropping out. Belasco (2013) expressed the importance of school counsellors in the school planning process, where he stated, "there is no school professional more important to improving knowledge than the school counsellor". School counsellors play a valuable role in assisting diverse students and ensuring that all students have supports and guidance to promote successful graduation from high school and entrance to college, with opportunities for future careers (Bridgeland & Bruce, 2011; Hart, 2012).

Similarly school counsellors are seen to be delivering an integral role towards student's career, academic, personal or social development (American School Counsellor Association, 2005). Additionally, through improved knowledge for giftedness as well as its special characteristics on the gifted child counsellors can provide these gifted students with ways in which could assist them to better understand themselves, others and various challenges in life (Peterson, 2015). Given that school counsellors provide counselling programmes in academic, personal, social and career. Their preventive counselling and intervention programs prior student crisis are very beneficial in assisting students towards overcoming high school attrition and remediating the dropout risks (Paport, 1993). Thus, in a school environment, effective programs should serve as a crucial aspect of counselling towards the achievement of student improvement (American Counselling Association [ACA]). Similarly, it is evident from literature that gifted learners experience challenges such as boredom, frustration, self-esteem, self-control, creativity and social interactions at school. Therefore, Hanover (2015) postulates that school counsellors are obliged to provide unique support to gifted learners at risk and to enhance academic and social engagement. Thus, suggested that professional support by districts is very crucial towards school counsellors for the wellbeing of affected gifted learners at risk. Burrus and Roberts (2012) were of a view that once an ability towards identification of students at risk is attained,

interventions from individual student level as well as school to district level can be put in place in order to remediate school dropouts.

(Moses et al., 2017, Gustafsson; Spaull, 2015). Tinto (1993) on the other hand, from the South African perspective posits that quite a number of students after getting themselves enrolled into college of their own choices often exit without a degree completion.). However, Tinto contents that a number of variables contribute towards learner dropouts such as individual, academic and social contexts which refer to the school, peers and home influences. And from these contexts exist such a huge influence which will either determine whether a learner achieves or fails in life (Christenson; Reschly & Wylie, 2012). Unfortunately, high levels of attrition are a cost to the nation's economy. Many authors believe that prevention measures must be applied as early as possible, while the students are still in school, because it is much easier to keep them in school than to induce them to come back (Franklin & Streeter, 1995; Rumberger, 1995). This suggests that we must be more concerned about at risk students than those who have already dropped out.

THE THEORETICAL FRAMEWORK

The conceptual model of the influence of engagement on students' dropouts was chosen as the theoretical framework for this study. The model was based on prior theories and conceptual models of dropping out that suggest that students' background prior to entering high school influences their engagement, which in turn influences their educational performance, more specifically students' academic achievement and dropping out (Finn, 1989; Newmann et al., 1992; Rumberger & Larson, 1998; Wehlage et al. 1989). The model suggests that engagement is a mediator between students' background and their educational performance. The double-headed arrow between engagement and academic achievement posits that there is reciprocal relationship between engagement and academic achievement. That is, changes in engagement may influence students' academic achievement, which then influences students' engagement. Both engagement and academic achievement have a direct influence on graduating or dropping out. The theoretical framework also suggests that the school context influences students' educational background, engagement, and educational performance. Therefore, in theory, schools can modify their context to increase student engagement and prevent students from dropping out.

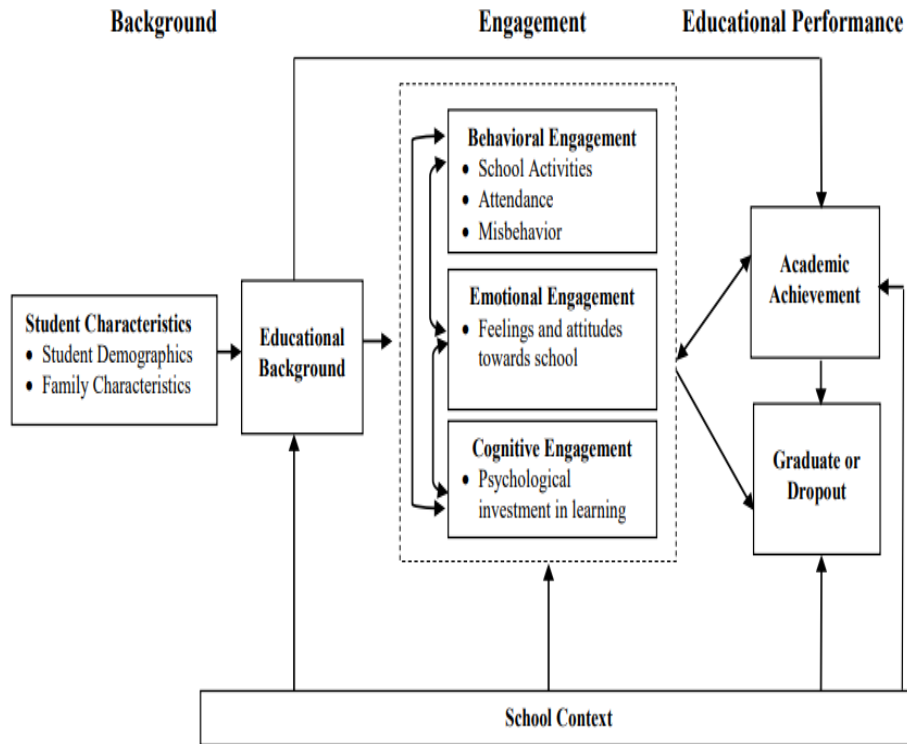


Figure 1. Conceptual Model Of The Influence Of Engagement On Student Dropout

Several theories have been proposed in order to try to explain the drop out phenomenon. Two of the most influential of those theories are Finn's (1989, 1993, 2006) 'frustration-self-esteem model' and participation-identification' model and Tinto's (1975, 1993, 2002) 'integration' model. In addition the majority of the drop out theories, including Finn's and Tinto's models, draw upon the more general concept of 'engagement' to conceptualize the drop out process. Rumberger (1987) suggests that dropping out itself might better be viewed as a process of disengagement from school, perhaps for either social or academic reasons. In this regard, both Rumberger and Larson (1998)'s framework for school mobility were conceptualized based upon (Finn, 1989; Tinto, 1989; Wehlange et al., 1989) 's work. According to literature, they suggest that acquisition of education is only possible due to school mobility which of course involves both behavioral and cognitive components. They (Finn et al., 1989) even went further to insist that involvement in school activities (social engagement) and engagement in learning (academic engagement) both hinder stability within the school environment (mobility between schools, dropping out and achieving academically). However, hypothesize that all the theoretical components are influenced by the student characteristics which involves experiences, attitudes and educational backgrounds, their family characteristics, schools and communities at large. Thus, from the literature we can conclude that there is a reciprocal relationship among each of the other aspects which highlight the fact that later stage precedes to affect student's attitudes, involvement and ultimately, their overall school experiences. Disengagement of a learner from variables such as context include writing of homework, parental monitoring and support, learner attendance and extracurricular participation (Finn, 1993). Furthermore, literature suggests that a learner's

increased interest at school serves as an intervention towards school dropout. Finn (1989) proposed the 'frustration –self-esteem model' and 'Participation Identification Model (PI)'. 'Frustration-self-esteem model' according to Finn, posits that those students who continuously persists to fail exhibits frustration and embarrassment feelings which in turn, ultimately leads to a lowered self-esteem. Unfortunately, the more the student persists to have a low self-esteem, they begin to develop a low self-view which leads them into engaging in and or displaying inappropriate behaviors such as (poor attendance, failure, truancy etc.) until they altogether disengage from the school.

However, participation identification model contends that, learner's active participation such as (preparation of assignments, paying attention and responding, contributes positively towards student's academic success, and having to feel some sense of belonging which in turn makes a child to value school and ultimately identify themselves with the whole school. In his theory (Finn, 1989) he refers to two internalized aspects as factors to identification (a)feeling a sense of belonging within the school premises and (b) school success. Student's lack of identification with the whole school will ultimately lead to non-participation in school curriculum and extramural activities which will induce further disengagement and lead directly to school dropout. Moreover Finn avers that externalized factors such as student's rejection by the school, lack of parental education-support and personal matters can either hinder or induce student's participation levels. It is however evident from Finn 's literature that there is a reciprocal relationship between the frustration self-esteem model which involves emotional aspects (truancy, lack of school interest, frustration, etc.) as well as participation identification model involving the behavioral aspects such as (lack of participation in school which both literally influence disengagement and ultimately precedes to school dropout. In fact (Alexander, Entwisle & Horsey, 1997; Barrington & Hendricks, 1989; Ensminger & Slusarcick, 1992) argue that variables such as attendance, behavior, academic performance and attachment to school are the factors that predict dropouts or completers from as early as elementary school.

Furthermore, it is evident based on the literature that "dropout" is a process of disengagement. Hence believing that engagement will be a promising a future e in curbing school completion (Reschley & Christenson, 2006, 2012). Thus, ever since Finn's theory of participation(behavioral) and belonging / identification (affective), engagement as a construct, has expanded with a variety of theorists including it as a cognitive component which refers to the learner's attitudes towards their education and their ability to develop friendship with peers (Fredericks et al., 2004) and other theorists with behavioral and academic engagement as both separate but related components which refers to a learner being able to complete their task and extracurricular participation and school rules compliance etc. (Appleton et al., 2006). Tinto (2014) contends that quite a number of students come from disadvantaged backgrounds whereby the cost of attending everyday lectures, and or spending time at the campus becomes unbearable. Consequently they become less privileged with regard to accessing institutional resources or having to associate themselves with other peers towards their studies. Hence he contends that institutional improvement rate in student success should at all costs be promoted in South Africa, through providing student access towards financial, academic, social and support which will ultimately precedes to student success. However, Tinto continues to stress that in addressing inequality and bettering improvement success, quite numerous sets of

structured, international and consolidated policies needs to be put in place, with of course the availability of resources, individuals, offices and program collaborations. Yet, a mutual understanding has to be attained as to why students fail to succeed with strategies in place toward success improvement thereof. Hence, in the process, taking into consideration and shaping student's social and cultural contexts in which they participate. In his theory Tinto, used these words " providing access without appropriate support does not provide meaningful opportunity to succeed". Therefore, he persists to highlight the importance counselling and support. According to him, student engagement and success can be achieved through taking first year students to seminars and orientation programs, so that they could be provided with advise and their skills can be developed. Thus, encouraging them to engage in the classroom and learning. However, attainment of the above can only be possible through the help of counsellors, individual staff members, individual academics and peer mentors (Tinto, 2014). Furthermore, both Tinto and Finn's models contends that dropout is a consequence of a long disengagement process from elementary school and precedes to student withdrawal from education. Therefore, in identifying students at risk of dropping out of school, disruptive behavior, attendance problems, poor grades, truancy could be possible identification warnings signs, that a student is beginning to disengage from school (Burrus & Roberts, 2016).

WHY TARGET PRIMARY SCHOOLS

Gifted dropouts, like most dropouts, appear to undergo a process of emotionally, cognitively, and behaviorally disengaging from school before they drop out (cf. Finn, 1989). Renzulli and Park (2000) suggested that schools have tended to ignore the warning signs that are present as early as the elementary years. Yet most of the dropouts reported difficulties as early as elementary school. Many researchers indicate that gifted students who drop out can trace their frustration with school to their elementary school years (Cramond et al., 2007; Hansen & Toso, 2007; Renzulli & Park, 2000, 2002). Finn and Cox (1992) claimed, "If a youngster does not become involved in learning activities in the first two or three grades. It is highly unlikely that he or she will become involved in later grades" (p. 159). Majority of researchers discovered that intervention efforts that occurred in ninth grade and later had almost no effect on whether or not a student dropped out (Coley, 1995; Drapela, 2006). Coley (1995) and Drapela (2006) called for early diagnosis of problems and provision of support services for students at risk. In addition, literature review contends that prevention measures should be applied as early as possible, while the students are still in school, because it is much easier to keep them in school than to induce them to come back (Franklin & Streeter, 1995; Rumberger, 1995). This suggests that we must be more concerned about at risk students than those who have already dropped out. Therefore, gifted learners at risk of dropping out methods of school, should be identified early in the South African schools and should be exposed to gifted career guidance programs (Burrus & Roberts, 2012).

HOW IS THE GIFTED LEARNER CONCEPTUALIZED

He then proposed the five level Metric Based System (MBS) which conceptualizes that various types of giftedness exist that places gifted learners in heterogeneous classrooms. Therefore,

(MBS) conceptualizes that giftedness can be distinguished into five degrees: Mildly, moderately, highly, exceptionally, extremely or profoundly.

Table 1: Levels of Giftedness in Metric Based System (Gagne, 2015)

<i>Level</i>	<i>Labels for Giftedness</i>	<i>Proportions</i>
5	<i>Extremely (Profoundly)</i>	<i>1:100 000</i>
4	<i>Exceptionally</i>	<i>1:10 000</i>
3	<i>Highly</i>	<i>1:1000</i>
2	<i>Moderately</i>	<i>1:100</i>
1	<i>Mildly</i>	<i>1:10</i>

(Gagne, 2015) conceptualizes giftedness through the Metric Based System theory in which he argues that although it is difficult to find those learners who are Highly, Exceptionally and profoundly gifted in the normal classrooms. However, educators may find at least one learner who is considered to be mildly gifted in each classroom of 10 learners. Additionally, literature posits that teacher's beliefs and attitudes are seen to be playing a vital role in the classroom environment (Moon et al., 1999; Ziv, 1990) hence, are considered a source towards gifted identification (McBee, 2006; Oakland & Roosen, 2005). Therefore, Gagne (2015) also hypothesizes that teachers nominations are a factor towards identification of gifted learners.

OBJECTIVE OF THE STUDY

1. To investigate what counseling strategies exist in the participating schools?
2. To attain an understanding as to what extent do these counselling strategies meet the needs of at risk gifted learners?
3. To identify ways as to how could these counselling strategies be enhanced to gifted dropout cases in the selected primary schools?

METHODOLOGY

The study will use a mixed methodology approach. According to Cameron (2015), mixed methods research comprises of a collection, analysis and interpretation of quantitative and qualitative data in a single study or collection of studies investigating the same phenomenon. Interviews will be conducted in order to collect and analyze teacher's understanding in identifying gifted learners who are at risk of dropping out of school. Questionnaires will be handed to participants in 5 primary schools.

POPULATION AND SAMPLE

A population of all the teachers and recommended learners from 6 primary schools at Maluti -a -Phofung Municipality in South Africa, will be studied. My study will employ a combination of two sampling techniques simultaneously, which are purposive and stratified sampling procedures purposive sampling procedure will be used because my study is particularly interested on those specific learners that will be nominated by teachers as gifted learners and those that are nominated as the potential dropouts. A stratified sampling procedure will be used in the study

since the study will comprise of three layers of which are the municipalities. It is called a stratified sampling because each municipality of a district need to have a representative. A purposive sampling will be employed at the schools.

WHAT ARE WE HOPING TO FIND

1. The study is a work in progress but the study hopes to find the following:
2. The nature of counselling strategies that are being used in the schools
3. The extent to which such strategies meet the needs of gifted students who are at risk of dropping out
4. Ways of enhancing such strategies

DISCUSSION

Literature review hypothesizes that gifted learners are most likely to experience psychological, emotional and intellectual (academic failure) problems which makes them to withdraw from school and ultimately dropout. However, their frustration can be traced back to their learning environment which leads to boredom, disengagement and withdrawal responses until they ultimately dropout of school. However, their teacher's harassment and lack of knowledge and skill in dealing with them is seen to be the other variable that contributes towards their dropout.

CONCLUSION

Literature proves that there is little research on counselling towards gifted students at risk of dropping out. Hence the needs of gifted students continue to be ignored in South African Schools. Additionally, there is little effort taken to best implement practices and strategies which are employed by the government and school districts towards the engaging and retaining the gifted students at risk. Many schools and districts should focus on retaining gifted students at risk through policies and legislations that focuses on the dropout of this outstanding population which is the gifted students and these policies should make use of counselling interventions and strategies towards remediating gifted dropouts within the South African schools.

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**P12. STRATEGIES OF PRIMARY SCHOOL TEACHERS TOWARD
MATHEMATICALLY GIFTED LEARNERS IN AN INCLUSIVE
CLASSROOM IN XHARIEP DISTRICT OF FREE STATE PROVINCE**

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ABSTRACT

In South Africa, Schools are defined as full-service schools (FSS) that are inclusive and welcoming of learners to develop their full potential irrespective of their background, culture, abilities or disabilities, their gender or race. However, the public schools' mass production approach to learning is not well appropriate towards the education of the gifted learners. This study aimed at investigating the strategies that the foundation phase teachers use toward mathematically gifted learners in inclusive classrooms. Fifty-five teachers completed questionnaires and their principals were interviewed from ten selected schools. Their responses were analysed statistically for teachers and content analysis followed for principals. The results show that principals support their teachers through conferences and workshops. However, teachers are unable to meet the gifted learners' needs due to lack of special training.

Keywords: mathematical gifted learners, inclusive classrooms

INTRODUCTION

Post 1994 South African schools got defined as full-service school (FSS) that are inclusive and welcoming of all learners and provide support to all learners to develop their full potential irrespective of their background, culture, abilities or disabilities, their gender or race (Department of Basic Education, 2014). The document "Guidelines for Responding to Learner Diversity in the classroom through Caps" emerged from the principles stipulated on Education White Paper 6 that emphasized the necessity of education and training system to change to accommodate the full range of learning needs, particularly on strategies for instructional and curriculum transformation (Department of Education, 2001). In responding to the diversity of learner needs in the classroom, delivery of curriculum differentiation is vital to ensure that all learners access learning as they have different potential to learn (Department of Basic Education, 2011). Yet, the task team reported that provincial education departments seemed to focus on underperforming schools and neglected gifted learners and learners with MST potential (Department of Basic Education, 2013). It draws the attention that if gifted learners are not supported anyhow, they'll miss the opportunity of performing to their full potential in inclusive classrooms. Therefore, this paper investigated how gifted learners are being identified and supported by teachers in inclusive classrooms.

STATEMENT OF THE PROBLEM

Although South Africa is a signatory to a number of international declarations and convention on education for all, the optimum access and successful participation of all learners including the gifted are still problems in advancing towards inclusive education. National Planning Commission NPC (2012) acknowledge that there is negligence of a critical component of the country's capability- the gifted learners. Yet there is evidence to show that any country's scientific development is directly influenced by accomplishment of its residents with high ability in science, technology, engineering and mathematics (STEM). NPC then recommended that opportunities for excellence be provided for such talented students.

PURPOSE STATEMENT

Teachers are the catalysts who translate gifts into talents through developmental process (Gagné, 2015). However, the focus is currently on learners with learning difficulties in regular classrooms (Mhlolo, 2017; Oswald & de Villiers, 2013). Given this, the purpose of this study was to explore strategies of primary school teachers toward mathematically gifted learners in an inclusive classroom.

RESEARCH QUESTIONS

Following the above mentioned recommendation, this study asked the following questions:

1. How are teachers' perceptions about their attitudes and strategies in identifying gifted learners in their regular classrooms?
2. What are teachers' perceptions about grouping strategies to cater for gifted learners in regular classrooms?
3. What do principals do to support ongoing staff development opportunities that provide information and strategies for teaching mathematically gifted learners?

LITERATURE REVIEW: INTRODUCTION

This study was guided by Gagné's fifth commandment about the way of developing education of gifted students that says "Thou shalt intervene earliest...." Therefore the researcher focused on primary schools where formal learning starts from grade 0 for beginners to grade 7 as the last grade of such school (Department of Basic Education, 2012). Thus, this study adopted Gagné's Differentiated Model of Giftedness and Talent as theoretical framework for this study (Gagné, 2007). His DMGT is relevant in identifying gifted learners as well as conceptualizing giftedness in this study. The mode of identifying gifted learners has for long been IQ tests. Gagne criticised the use of IQ tests for they are not relevant and ideal instrument for learners who are not first English speakers. For instance if non first English speakers fail the IQ test, it does not mean that the learner is not gifted, but failed the test due to unfamiliar language. In this case, the IQ test measured the performance instead not the potential. Therefore Gagne developed his Metric-Based System of levels to identify gifted learners and these are shown in figure 1 below:

The DMGT's Metric-Based System of Levels Within the Gifted/Talented Population			
Level	Label	Ratio in General Population	IQ Equivalents
5	Extremely	1:100,000	165
4	Exceptionally	1:10,000	155
3	Highly	1:1,000	145
2	Moderately	1:100	135
1	Mildly	1:10	120

Figure 1 The DMGT's Metric Based System of levels within the Gifted/Talented Population (Gagné 2007:97)

DEFINITION AND CONCEPT OF GIFTEDNESS

Given the numerous definitions of giftedness, in this study the term 'gifted' is used in accordance with Gagné (2015) and Renzulli's (2012) recommendations, to refer 1:10 students who attended every day regular class and demonstrate relatively high mathematical ability. This suggests that every regular classroom teacher should be regarded as a teacher for the gifted hence the concern in this study of regular classrooms teachers. Focus on 'mildly gifted students also follows Gagné (2015) recommendations that highly gifted/talented (1: 100 000) individuals are a rarity. This rarity level is such that full-time teachers in their 35-year professional career, encounter just a few if any of these extremely gifted students. In an attempt to answer the research questions further, the researcher looked into the possible grouping strategies such as mixed-ability and like ability used in teaching and learning of gifted learners. A mixed-ability class comprises the same material and learning tasks at the same time for all learners but does not assist gifted children in any way (Rogers, 2002) and Clark (2013) ascertains that like-ability groups produce higher academic effects for gifted learners than mixed ability groups do. However, (Reid and Boettger, 2015) indicated that gifted learners in Australia receive special attention through enrichment, workshops, individual mentors or various programmes regarding languages, Maths, science, music or sport in regular classrooms (Reid & Boettger, 2015). Yet, in our country such regular classrooms do not present ideal environments for gifted students in a practical context to develop to their full potential (Mhlolo, 2017).

METHODS

A mixed method was used to explore the grouping strategies teachers use in catering for the needs of mathematically gifted learners in inclusive classrooms. The rationale for using a mixed method was that it had been used among others, to gather trend data and individual perspectives from community members and provide a better understanding of a research problem or issue than either research approach alone (Creswell, 2014). Mixed methods research addresses both the 'what' and 'how or why' types of research questions (Cohen, Manion & Morrison, 2011). This study emerged from Gagné's fifth commandment that suggests the need for earliest identification of gifted learners as early as pre-kindergarten (Gagné, 2015). So, 55 foundation phase mathematics teachers were purposively sampled to complete the given

3-point Likert scale questionnaires. A Likert scale had been one of the most commonly used tools that measures people's attitudes and it was used to indicate a range of responses of the survey (Maree, 2007). The purposive sampling was used for this study for its relevance as the researcher was interested in mathematics teachers only. Furthermore, foundation phase teachers from ten selected primary schools of Xhariep district were chosen because many high-performing students lose ground from elementary to middle school. Cohen, Manion and Morrison (2011) indicated that the purpose of the interview is to gather data in surveys or experimental situations. Therefore, the researcher also conducted the face-to-face structured interview for principals to elaborate on experiences that had helped or hindered their developmental support toward mathematically gifted learners.

RESULTS

Results 1 respond to the first research question: How are teachers' perceptions about their attitudes and strategies in identifying gifted learners in their regular classrooms?

Figure 2: Respondents' view on having gifted learners in classes

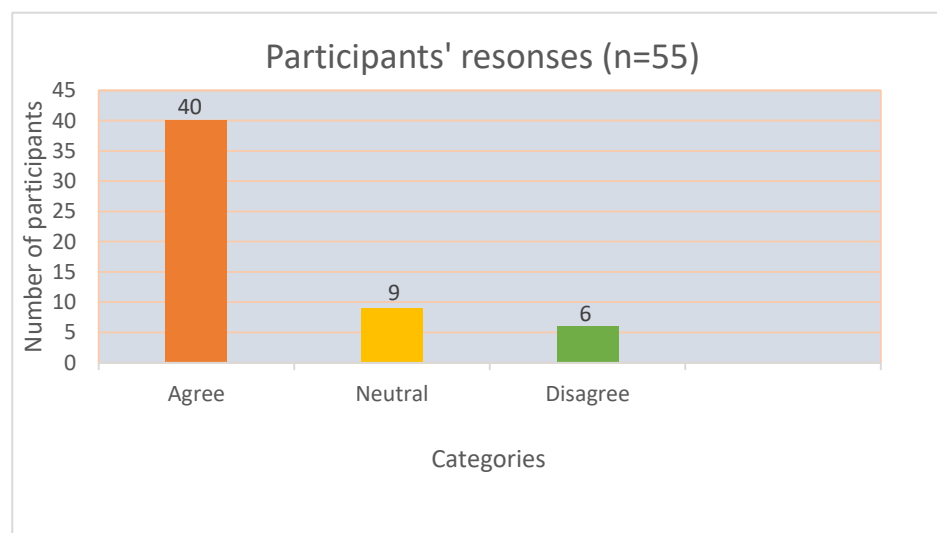


Figure 2 above, indicates the responses of teachers on having gifted learners in their classes as a form of identifying them from rest of the class. On whether they have gifted learners in their classes, the majority of teachers agreed with this notion. Figure 1 shows that 40 teachers were able to identify gifted learners whilst 9 teachers were neutral in doing so. The remaining minority of 6 teachers disagreed in being able to identify gifted learners in their regular classes. This is an indication that the majority of teachers seemed to be able to identify gifted learners in their class according to their different characteristics.

Results 2 respond to the second research question: What are teachers' perceptions about grouping strategies to cater for gifted learners in regular classrooms?

Figure 3: Respondents' grouping strategies to cater for gifted learners

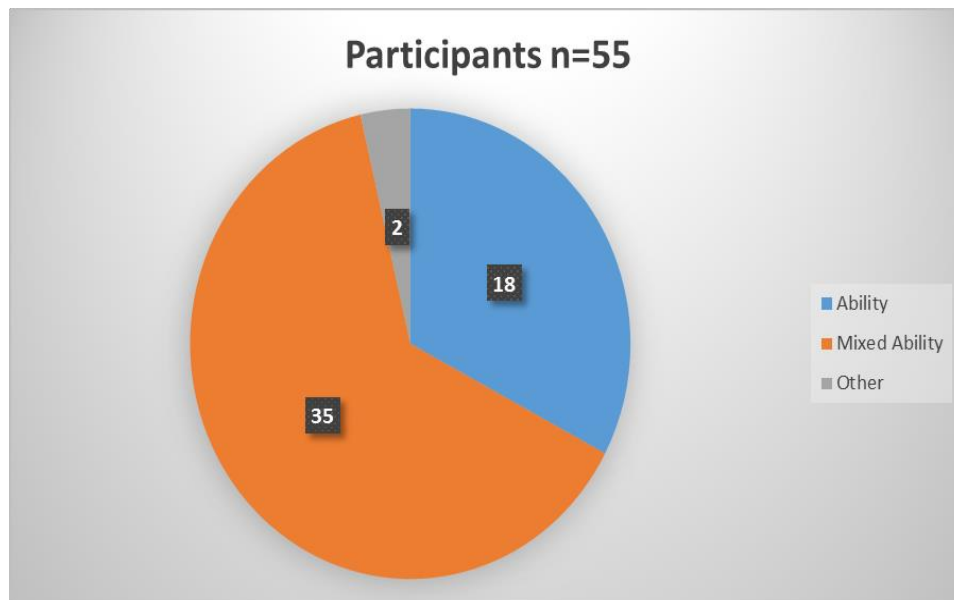


Figure 3 above shows that 18 teachers grouped their learners according to their ability. On the other hand, the majority of 35 teachers used mixed ability grouping as a strategy in attempt to meet different learners' needs in regular classes. The remaining 2 teachers were of the view that they either used gifted learners to keep discipline in class while teachers were attending to the learners with academic challenges. The further explanation was that gifted learners were also used for peer teaching as the strategy in order to boost the "slow" learners.

RESULTS 3

The third research question was: What do principals do to support ongoing staff development opportunities that provide information and strategies for teaching mathematically gifted learners?

In responding to the ongoing staff development strategies to teach mathematically gifted learners, 9 principals developed their teachers through workshops, PLCs and conferences such as AMESA as stated using acronyms:

PF reported: "I encourage educators to join mathematics bodies such as AMESA, Hey Maths, and programs for Professional Learning Committee (PLC), to empower one another and to learn other practices from colleagues".

PS further elaborated: "Educators are encouraged to enroll for further qualifications in order to broaden their skills, knowledge and abilities. This will help them to broaden their horizon and be able to look further than just a field at school level. They'll be able to do research and to come up with strategies. When they enroll, do short time courses and attend workshops and seminars they'll acquire new knowledge to the existing knowledge".

PM also mentioned: “They make sure they use the CAPS document which gives them guidelines on how to do everything. They differentiate the activities for the gifted and the slow ones”.

The tenth principal, **PG** responded differently in this manner: “The school doesn't do anything about mathematically gifted learners. It's only the expanded opportunity and then they get bored but up to so far the workshop are in place for educators to enrich their minds and, even the department is helping us in that regard to see to it that educators are well trained in terms of trying to make mathematics easy for them to be able to teach learners effectively. But generally so for gifted learners as the school, we are not doing anything till this far”.

DISCUSSION

In regard to teachers' perceptions about their attitudes and strategies in identifying gifted learners in their regular classrooms, figure 2 presents the results. It shows that the majority of participants that is 73% of teachers claimed that they had gifted learners in their regular classrooms. This majority of teachers seemed to have an idea of who gifted learners are in an inclusive classroom irrespective of the previous findings in South Africa that confirmed the lack of training particularly in gifted education (Oswald & de Villiers, 2013). This could be that the majority of participating teachers identified gifted learners upon their performance not according to their potential as Gagné (2015) opposed the IQ tests that focus on performance. Similarly, research by Heller (2004) pointed out that the preparedness of parents, teachers, school counsellors and psychologist to deal with the tasks of identifying and nurturing the gifted without fear or prejudice, remained a main concern.

In using grouping strategies, the 64% of participants of this study chose the mixed ability whilst 33% opted for ability group. These choices confirm the previous research that a mixed-ability class comprises the same material and learning tasks at the same time for all learners but does not assist gifted children in any way (Rogers, 2002). This suggests that the majority of participants use mixed-ability as 'one size fits all' whereas in South Africa, regular classrooms do not present ideal environments for gifted students in a practical context to develop to their full potential (Mhlolo, 2017).

In responding to the ongoing support of teachers by their principals, the results indicated that 9 principals developed their teachers through workshops, PLCs and conferences such as AMESA and studying further for enrichment while only 1 of them seemed to have an idea of differentiation. This confirms the right direction to that of Australia where gifted learners receive special attention through enrichment, workshops, individual mentors or various programmes regarding languages, **Maths**, science, music or sport in regular classroom (Reid & Boettger, 2015). However, PG ascertained that the school does nothing about mathematically gifted learners in particular. this is similar to the findings of the principals interviewed by (Oswald & de Villiers, 2013) who indicated that the gifted child would always be the first to be left on his/her own without being given enough support as the focus is on improving pass rate for everyone.

CONCLUSION

The participants of this study seemed not to be ready in identifying gifted learners in their regular classes and they were using 'one size fit all' strategy in grouping their learners to cater for all learners' needs. Teachers and principals need training toward teaching and learning of gifted learners. This is important given that in some countries like Australia, gifted learners receive special attention through enrichment, workshops, individual mentors or various programmes in languages, Maths, science, music or sport in regular classrooms (Reid & Boettger, 2015).

IMPLICATIONS

This paper's recommendations follow the presented results in this manner:

- Teachers should be trained in gifted education in order to identify and handle gifted learners in regular classroom.
- South African education system needs a rapid change that caters for gifted students in order to sustain its economy as Britt (2010) asserted that the country's economic success had been directly influenced by innovation and science, technology, engineering and mathematics (STEM) education of its gifted students

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P14. HIGH SCHOOL TEACHERS' ATTITUDES TOWARDS MATHEMATICALLY GIFTED LEARNERS

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ABSTRACT

The aim of this study is to examine the attitudes of high school teachers towards the education of mathematically gifted learners. The participants of this study are high school mathematics teachers. Teacher responses were compared and contrasted to identify differences and patterns. The study found that teachers felt they were adequately enriching curriculum for gifted high school mathematics learners. However, in many cases, gifted learners were not given enrichment tasks that extended beyond those that were given to the entire class. Though participants felt that they were using appropriate grouping methods, the study revealed that teachers often grouped gifted learners with the purpose of boosting the performance of struggling learners. In such circumstances, gifted learners were not grouped with other high achieving learners for the improvement of mathematics ability.

INTRODUCTION

Gifted learners have a wide range of characteristics and do not always display the same traits. Since their learning needs vary from those of mainstream students they require substantially differentiated learning environments, curriculum (Adams & Pierce, 2004; Knopfmacher & Kronborg, 2002; Kronborg & Plunkett, 2008; Maker & Schiever, 2010; VanTassel-Baska, 1997, 2003, 2005; Reis, 2001). Gifted students need the appropriate pace, depth and breadth in their learning, along with, like-minded peers with whom they can learn. As a result of their unique abilities, teachers often fail to recognise and meet their needs adequately. These learners in the regular classrooms are often taught by teachers with different attitudes and are grouped with peers of other interests (Marumo & Mhlolo, 2017).

Studies on teacher attitudes towards gifted students and gifted education, show that negative or positive teacher attitudes might be determined by different variables, such as knowledge (e.g. Bransky, 1987; Donerlson, 2008; Moore, 2009), in-service gifted training programmes (e.g. Copenhaver & McIntryer, 1992; Donerlson, 2008), experience (Mills & Berry, 1979; McCoach & Siegle, 2007), and teacher's degree (e.g. Bransky, 1987).

Gifted learners, when properly supported throughout their education system, have the potential to contribute in the development of societies. Therefore, teachers' support is necessary to provide the appropriate conditions for the education of the gifted. In uncovering the potential of the gifted learners and establishing appropriate support, it is important to raise awareness among teachers. This would assist in promoting positive attitudes towards the support of

differentiated education to gifted learners. The aim of this study is to examine the attitudes of high school teachers towards the education of mathematically gifted learners.

METHODOLOGY

The study used a mixed methodology approach in examining the attitudes of high school teachers towards mathematically gifted learners. Structured questionnaires and semi-structured interview in mixed method allow the researcher to generate confirmatory results regardless of differences in data collection methods (Harris & Brown, 2010). A total of 19 grade 10 high school teachers from Bloemfontein, South Africa participated in the study. All the participants were mathematics teachers. Permission was obtained from the Free State Department of Basic Education as well as the principals of the schools prior to conducting the study. Questionnaires were hand delivered to the participants at 10 schools and were collected after 2 days. Moreover, the participants completed the questionnaires at their schools, and in case of the absent teachers, the questionnaires were left to school administrators.

FINDINGS AND DISCUSSION

Altogether there were 19 participants who answered the following questions on the questionnaire:

‘How comfortable are you in teaching mathematically gifted learners?’

Table 1: Level of comfort when teaching mathematically gifted learners (n=19)

<i>Answer</i>	<i>Frequency</i>	<i>Percentage</i>
<i>Very comfortable</i>	<i>13</i>	<i>68.4</i>
<i>Fairly comfortable</i>	<i>4</i>	<i>21.1</i>
<i>Neither comfortable nor uncomfortable</i>	<i>2</i>	<i>10.5</i>
<i>Fairly uncomfortable</i>	<i>0</i>	<i>0</i>
<i>Very uncomfortable</i>	<i>0</i>	<i>0</i>
<i>TOTAL</i>	<i>19</i>	<i>100</i>

Table 1 shows that a high percentage of teachers (68.4%) feel very comfortable when teaching mathematics to gifted learners. Only 21.1% of them indicated that they are fairly comfortable. A small proportion of the sample (10.5%) was neutral about this issue.

‘Mathematically gifted learners make your teaching in the classroom’

Table 2: Levels of ease and difficulty when having gifted learners in the classroom (n=19)

<i>Answer</i>	<i>Frequency</i>	<i>Percentage</i>
<i>Easy</i>	<i>4</i>	<i>21.1</i>
<i>Very easy</i>	<i>7</i>	<i>36.8</i>
<i>Neither easy nor difficult</i>	<i>7</i>	<i>36.8</i>
<i>Difficult</i>	<i>0</i>	<i>0</i>
<i>Very difficult</i>	<i>1</i>	<i>5.3</i>
<i>TOTAL</i>	<i>19</i>	<i>100</i>

A large proportion of the sample (57.9%) admitted that gifted learners make teaching easy in their classrooms. Only a few educators (5.3%) indicated that having gifted learners in mathematics classrooms makes teaching very difficult.

‘How well do you think the needs of mathematically gifted learners are addressed in your school?’

Table 3: How well are the needs of mathematically gifted learners addressed in schools (n=19)

<i>Answer</i>	<i>Frequency</i>	<i>Percentage</i>
<i>Very well</i>	<i>4</i>	<i>21.1</i>
<i>Well</i>	<i>7</i>	<i>36.8</i>
<i>Adequately</i>	<i>7</i>	<i>36.8</i>
<i>Poorly</i>	<i>0</i>	<i>0</i>
<i>Very poorly</i>	<i>1</i>	<i>5.3</i>
<i>TOTAL</i>	<i>19</i>	<i>100</i>

This table highlights a belief among most teachers (36.8%) that the needs of gifted learners are well addressed in schools. The same percentage (36.8) indicated that the needs are adequately addressed and 21.1% showed that the schools address the needs very well. Just 5.3% thought otherwise as indicated that the needs are very poorly addressed.

‘Do you feel you need extra support regarding gifted learners?’

Table 4: Extra support needed regarding gifted learners (n=19)

<i>Answer</i>	<i>Frequency</i>	<i>Percentage</i>
Yes	14	73.7
No	3	15.8
Not sure	2	10.5
TOTAL	19	100

Table 4 indicates that a large number of teachers (73.7%) in regular classrooms need extra support to teach gifted learners more effectively. Only 15.8% indicate that extra support is not necessary and fewer respondents 10.5% could not comment.

‘If yes, in which areas?’

Table 5: Areas in which extra support is needed regarding gifted learners (n=32)

<i>Area</i>	<i>Frequency</i>	<i>Percentage</i>
<i>Teaching materials for gifted learners</i>	11	34.4
<i>Identifying gifted learners</i>	2	6.3
<i>Supporting gifted learners in the classroom</i>	3	9.4
<i>Supporting gifted learners outside the classroom</i>	7	21.9
<i>Monitoring gifted learners’ progress</i>	9	28.1
Total	32	100

The questions in table 4 were more practical issues of perceived extra support in relation to the different areas regarding gifted learners. The largest single proportion (34.4%) suggested that teaching materials for gifted learners were appropriate. Other teachers (28.1%) appear to ask for extra support on monitoring gifted learners’ progress, while there are also teachers (21.9%) who need training in supporting gifted learners outside the classroom. A smaller proportion of respondents, just fewer than 10% indicated that training is needed in supporting gifted learners in classrooms. A similar proportion also stressed the need for extra support in identifying gifted learners from other learners in classrooms is a relevant way.

The interview with the Ten teachers were coded as T1, T2, T3, T4 and the like. The following questions were asked during the interview:

Interview Question 1: 'Do you feel that gifted learners should be given the same or challenging activities than their classmates?'

When the teachers' views on question 'Do you feel that gifted learners should be given the same or challenging activities than their classmates?' were analysed, the qualitative results showed that teachers reported positive attitudes towards the activities that gifted learners should receive. T4 mentioned more challenging work is necessary for gifted learners: *"...If you don't give them more challenging work, they will finish early, and they will disrupt the class. Give them extra work and improve their quality as well."* In contrast, two interviewees in the semi-structured interview held a negative attitude about the activities of gifted learners. T7 thinks it is unfair for these learners to have more challenging work: *"I don't think it's fair. I think it is much fair when because learners are gifted and yes, it is, but I think it's not fair for them to get more challenging questions."* In addition, T10 commented that if gifted learners get more challenging work, the slow learners get discouraged: *"I think that it will be a problem to give them more challenging activities because I think it will discourage others, the slow learners they will think others are better than them, so they must be given the same."*

Interview Question 2: 'What do you think are the best strategies to support gifted learners?'

Three interviewees felt positive as they believe that entering competitions, teaching gifted learners separately and creating groups are best strategies to meet the needs of gifted learners. For example, T2 said: *"Ok, ways to support sometimes forming groups they must form groups themselves and give them problems so that they help each other. Sometimes you intervene in the very same groups. That would be the first thing, forming groups themselves and intervening as the teacher and helping them out"*. T5 pointed out that gifted learners in the regular classrooms should be made tutors in the groups: *"The best ways to support gifted learners is that you have to make them work, create groups, make them group leaders, give them the work like (errr) or make them your tutors. You are a teacher make them tutors"*.

Interview Question 3: 'What makes you comfortable or uncomfortable when teaching mathematically gifted learners?'

The main reasons highlighted about being comfortable when having gifted learners in the mathematics classrooms were that as teachers, they have different approach to delivering the content, they prepare more and research on the topic to be taught, they complete the syllabus in a short period of time and they can account easily to the senior officials as they get good results.

However, T5 had a negative attitude and commended that he feels uncomfortable in the presence of gifted learners because he is anxious about being corrected by the learners for making mistakes in his teaching. T5 said: *"It is not that I'm comfortable because mathematically gifted learners each and every mistake or error that you commit they are on top of you. They can detect easily when you made a mistake."* This finding in T5's case was not surprising as previous research also indicated the presence of different feelings among teachers who taught in a classroom where there are gifted learners (Galbraith, Delisle, & Espeland, 1996).

Interview Question 4: 'Why do you feel that having gifted learners in your classroom makes your work easy or difficult?'

Teachers commented on the level of ease when having gifted learners in their classrooms. The main reasons highlighted by the teachers were that the performance of gifted learners makes reporting to the seniors easier, teachers do not struggle to explain concepts to these learners, they do not have to explain one thing over and over again to the gifted ones, these learners are able to share their understanding with the rest of the class, and their participation encourage and motivate teachers. Teachers' responses to the questions are given below.

"... So it makes for me in terms of reporting, if we are forced to report why learners are failing, we just tell them that if this one can make it in the same class, what is wrong with others. So, it makes my work or somehow my accountability easier because they will be the ones that you will refer to sometimes." (T4)

"It makes my work easy because I don't have to explain one thing over and over again." (T7)

CONCLUSION AND RECOMMENDATIONS

The major purpose of this study was to determine the attitudes of high schools' teachers towards mathematically gifted learners. The findings showed mixed results, with both positive and negative attitudes towards mathematically gifted learners. These mixed results are similar to views expressed from respondents in previous studies (Allodi & Rydelius, 2008; Lassig, 2009; McCoach & Siegle, 2007; Perković Krijan, Jurčec, & Borić, 2015; Watts, 2006). Therefore, it is recommended that administrators in the Department of Education resolve the obstacles associated with inclusive education so that exclusive education (special classes for gifted learners) can be applied for gifted learners as a permanent solution to meet their needs. The special classes for gifted learners approach can provide both special gifted programming based on high knowledge and skills of gifted programme teachers and opportunities for gifted learners to interact with regular learners in ways that can be mutually and socially enriching.

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**P15. PRIMARY SCHOOL TEACHERS' RELATED BARRIERS PERCEIVED
TO HINDER TEACHING AND LEARNING OF THE GIFTED LEARNERS
IN INCLUSIVE CLASSROOMS**

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ABSTRACT

South African MST task team reported the negligence of the gifted learners and learners with MST potential in provincial schools but the focus being on the underperforming schools. Empirical studies indicated lack of teachers' educational training particularly in meeting the needs of the gifted learners through inclusive education. This study aimed at investigating the teacher related barriers perceived to hinder the teaching and learning of the gifted learners in inclusive classrooms. A survey research design was used for purposively 50 foundation phase mathematics teachers in Thaba Nchu. The researchers collected data by means of a 3-point Likert scale questionnaires. The results indicate that teachers still lack training that result in attitudes which unfortunately disadvantage the gifted learners to perform to their full potential.

Keywords: gifted learners, barriers, attitudes

INTRODUCTION

In South African schools, gifted learners are found in inclusive classrooms where teachers have to deal with a wide diversity of learners. Although South Africa is a signatory to a number of international declarations and convention on education for all, Empirical studies had shown that in such classes growing teacher-pupil ratios escalated difficulties faced by gifted learners and their teachers (Mohokare & Mhlolo, 2017). Similarly, Oswald and De Villiers (2013) asserted that teachers who they interviewed were of the view that inclusive education was more on the emphasis on inclusion of learners with disabilities and learning challenges. Furthermore, (Mhlolo, 2017) argued that gifted learners are still not receiving adequate support in mainstream classes due to lack of teachers' training particularly in catering for such exceptional learners' needs. One of his five commandments that deal with developing the talent into gifts, Gagné's (2011) emphasized that the intervention of these gifted learners should begin at the earliest age as kindergarten or first grade. It was upon this commandment that the researchers focused on primary schools' teachers.

It was important to investigate teacher perceptions because it is their way of interpreting objects (learners) and events (teaching and learning) that matter (Eggen & Kauchak, 2014). Perceptions are important as they are determined by attitudes, emotions and expectations (Démuth, 2013). It was against these observations, that this study aimed at exploring perception of teachers'

related barriers towards mathematical gifted education in selected Thaba Nchu selected primary schools.

LITERATURE REVIEW: INTRODUCTION

The neglect of gifted education had been usually attributed to Galton (1869) who established an elitist philosophy that states that giftedness is not for black people and the poor. Previous findings in South Africa confirmed lack of training particularly in gifted education (Oswald & de Villiers, 2013). Similarly, Mhlolo (2017) argued that the gifted learners are still not receiving adequate support in mainstream classes due to lack of teachers' training particularly in catering for such exceptional learners' needs.

It demands the teacher's insight, knowledge and understanding of how to identify gifted learners in his or her regular classroom. In her 2- sided common characteristics, Kokot (1999) stated that the left hand side (positive) characterise the gifted but opposed by the right hand side often seen as special abilities at educational settings and others that do not support gifted learners' needs due to lack of understanding giftedness. Such positive characteristics include learning comes easily; abstract reasoning abilities; questioning- critical thinking skills and ability to work independently. Similarly, Stepanek (1999) argued that these are common myths about gifted students: gifted children are smart, so they can get by on their own; gifted students excel in all school subjects; gifted students are a homogeneous group.

In South Africa, there are annual reports on developments of education since 2010 such as, the MST task team that reported the negligence of gifted learners and learners with MST potential but the focus being on under-performing schools (Department of Basic Education, 2013). If teachers do not recognise the significance of reading such reports and react on them, the possibility is they will be archived somewhere in classrooms' cabinets or libraries. So, this will leave learners especially the gifted, unattended in terms of being supported by their teachers according to their different learning needs because currently the focus is on learners with learning barriers or difficulties (Oswald & de Villiers, 2013; Mhlolo, 2015). Despite all the measures, model and methodology used to identify the gifted learners in different domains such as mathematics, Heller (2004) pointed out that the preparedness of parents, teachers, school counsellors and psychologists to deal with the tasks of identifying and nurturing the gifted without fear or prejudice, had been a main concern.

STATEMENT OF THE PROBLEM

Although, in its field testing the implementation of inclusive education, the Department of Basic Education (2010) paid specific attention in detecting levels of support needed to maximise opportunities for success toward children with barriers to learning including disabilities in mainstream classrooms. This revealed no emphasis specifically on gifted learners toward such right of inclusive education. Furthermore, National Planning Commission NPC (2012) acknowledged there is negligence of a critical component of the country's capability – the gifted students. Yet there is evidence to show that any country's scientific development is directly influenced by accomplishments of its residents with high ability in science, technology,

engineering and mathematics (STEM). NPC then recommended that opportunities for excellence be provided for such talented students.

AIMS AND OBJECTIVES OF THE STUDY

Department of Education (2011) indicated that in all classrooms, learners have diverse learning needs that due to failure to support and responded to would lead to barriers to learning. Based on this vital concern, this study therefore aimed at exploring perception of teachers' related barriers towards mathematically gifted education at selected primary schools in Thaba Nchu. In order to achieve this aim, the researchers focused on the objectives mentioned below:

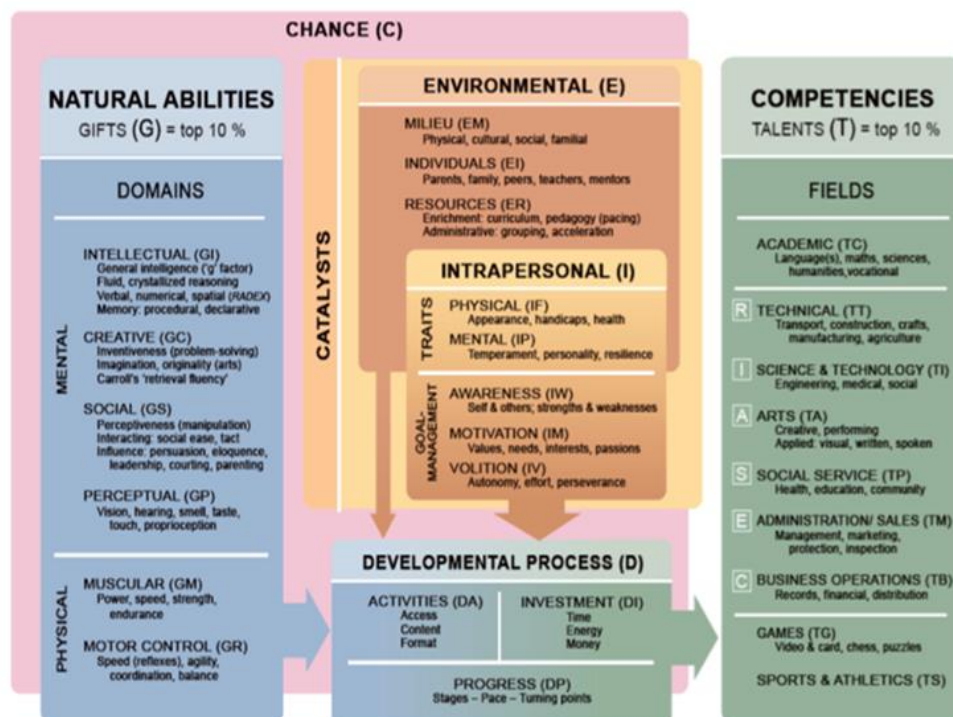
1. To determine teacher preparedness in meeting the needs of the mathematically gifted learners
2. To explore teacher awareness of current developments in gifted education
3. To determine teachers' attitudes towards and strategies they use to identify gifted learners in their regular classroom

WHY TEACHERS MATTER

The concern with teacher preparedness follows Gagné's recommendation that the teacher is the most critical agent for change because he/she manipulates all the other resources. Similarly, Clark (2002) argued that classroom teachers have the most significant influence on the learning, development and achievement of gifted students. In South Africa, the Gauteng Department of Education (2010) also conceptualised a model that places the teacher at the centre of the teaching and learning process.

THEORETICAL FRAMEWORK

Figure 1: Gagné's Differentiating Model of Giftedness and Talent (DMGT)



In Figure 1 above, Gagné's model of differentiating Giftedness and Talent, he shows the existence of the separation of Gifts and Talents by developmental process. Gagné demonstrates that students' natural abilities which are gifts, emerge from mental and physical domains. Mental domain consists of intellectual-GI, creative-GC, social-GS and perceptual-GP whereas the physical one constitutes muscular-GM and motor control-GR. Competencies known as Talents are found in the following fields: academic (TC), technical (TT), science and technology (TI), arts (TA), social service (TP), administration/sales (TM), business operations (TB), Games (TG) and sports and athletics (TS). Therefore, Gagné (2015) argued that the usage of interchangeable of gifts and talents is misleading, inappropriate and damaging all angles of trying to nurture talent because the talent cannot develop on its own. Following the demonstration above, **Giftedness** refers to a student's outstanding natural abilities or aptitudes (called gifts), located in one or more domains: intellectual, creative, social, perceptual or physical, placing that student in the top 10% of age peers.....**Talent** is the outstanding mastery of systematically developed competencies (knowledge and skills) in one or more fields of human activity that places a student in the top 10% of age peers in that field (Gagné, 2015).

METHODS

In survey research design, the investigator selects a sample of subjects and administers a questionnaire or conducts interviews to collect data (McMillan & Schumacher, 2014). A Likert scale had been one of the most commonly used tools that measures people's attitudes and it was used to indicate a range of responses of the survey (Maree, 2007). Therefore, the researchers used a questionnaire of 3-point rating Likert scale to measure teacher perceptions particularly in identifying mathematically giftedness in their regular classrooms. This study focused only on a purposively selected sample, that is, foundation phase mathematics teachers who taught mathematics in 3 grades of the phase being; grades 1, 2 and 3. The participants were from ten selected schools in Thaba Nchu.

RESULTS

In the first category of teacher preparedness, Table 1 shows that 30% of teachers agreed to have been trained to teach gifted learners. 40% were neutral on being trained to teach gifted learners in their regular classrooms. The remaining 30% disagreed to have received such training. This suggest that the majority of teachers need teacher training toward teaching the gifted learners in their regular classrooms.

Table 1: Teachers' responses in regard to training

	<i>Agree (%)</i>	<i>Neutral (%)</i>	<i>Disagree (%)</i>
<i>Did you receive training on how to teach gifted learners</i>	30	40	30
<i>Do you feel competent enough to teach gifted learners</i>	20	40	40
<i>Do you think Higher Education Institutions should include Content on gifted education in their courses</i>	88	6	6

According to the second category, Table 1, shows that 20% of teachers claimed to be competent in teaching gifted learners in their regular classrooms. 40% of teachers were neutral and the remaining 40% disagreed to be competent to teach gifted learners. This could imply that majority of teachers require some sought of training and or in-service training in order to be prepared to teach gifted learners in their regular classrooms.

In the last category, Table 1 above indicates that the majority of teachers, 88%, were of the opinion that a course content on gifted education should be included at higher education institutions. 6% were neutral and the remaining 6% disagreed on such opinion. This implies that there is a vital need for Gifted Education at higher institutions so that teachers can be well prepared to teach the gifted learners in their regular classrooms.

Table 2: Teachers' responses on educational awareness regarding gifted education

	<i>Agree (%)</i>	<i>Neutral (%)</i>	<i>Disagree (%)</i>
<i>I am aware of recommendations of National Planning Commission in regarding gifted learners</i>	20	48	32
<i>I am aware of MST Task force's recommendations regarding gifted learners</i>	30	36	34
<i>The CAPS documents make sufficient provision for teachers to cater for gifted learners' needs</i>	36	14	50

The following are the results of the first category of policy documents' awareness and provisions of gifted education. Table 2 shows that minority of teachers, 20%, agreed on being aware of the National Planning Commission's recommendation regarding gifted learners. The other 48% of teachers were neutral on being aware of such a recommendation. The remaining 32% disagreed in terms of being aware of this recommendation. This could imply that teachers are not considerate in reading about the developments around gifted education.

According to the second category, Table 2 above shows that 30% of teachers agreed to have been aware of the Task Force's recommendation regarding gifted learners. The other 36% were neutral on being aware of this recommendation. Further 34% of teachers disagreed in terms of being aware of the recommendation. This could imply that the majority of teachers need an awareness campaign about the developments regarding gifted education through workshops or their cluster meetings.

In the last category, Table 2 above shows that 36% agreed that the document makes sufficient provision to attend to the needs of gifted learners, 14% were neutral to this statement, while 50% disagreed to it. This could imply that teachers are not making effort in attending to the needs of gifted learners in their classrooms.

Figure 2: Teachers' attitudes and strategies in identifying gifted learners in their classrooms

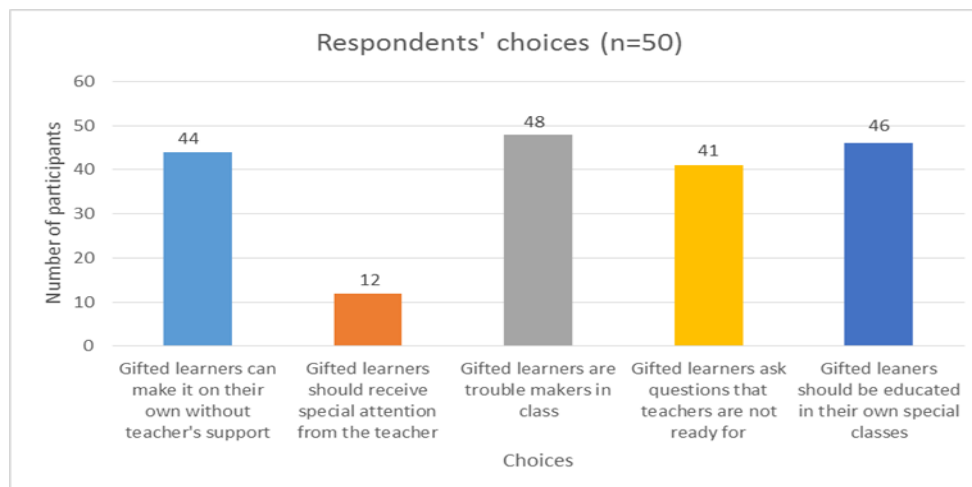


Figure 2 above presents the following results:

There were 44 teachers who claimed that “gifted learners can make it on their own without teacher support”. Then 12 teachers opted that “gifted learners should receive special attention from the teacher”. The other 48 teachers indicated that “gifted learners are trouble makers in class”, On the other hand, 41 teachers chose, “gifted learners ask questions that teachers are not ready for.” The last choice had 46 teachers who indicated that “gifted learners should be educated in their own special classes”.

DISCUSSION

The results in regard to teacher preparation show that 30% of participants agreed to have been trained to teach gifted learners. Then only 20% of teachers were confident in teaching gifted learners. Lastly, 88% of participants were of the opinion that higher institutions should offer gifted education. This confirms previous findings in South Africa that teachers lack training particularly in gifted education (Oswald & de Villiers, 2013). Similarly, (Mhlolo, 2017) asserted that gifted learners are still not receiving adequate support in mainstream classes due to lack of teachers' training particularly in catering for such exceptional learners' needs.

In response to awareness of educational policies, minority of teachers, 20%, claimed to be aware of the National Planning Commission's recommendation regarding gifted learners. On the other hand, 30% of teachers agreed to have been aware of the Task Force's recommendation. Lastly, 36% agreed that the document makes sufficient provision to attend to the needs of gifted learners. The results confirmed the previous research findings that awareness plays an important role in school and teacher accountability (Worldbank in UNESCO, 2017). Teachers of this study were not aware of the current developments in regard to gifted education.

The third and last objective was about Teachers' attitudes and strategies in identifying gifted learners in their classrooms. The results in figure 2 above confirm Kokot (1999) positive characteristics that include learning comes easily; abstract reasoning abilities; questioning-critical thinking skills and ability to work independently. Similarly, Stepanek (1999) argued that these are common myths about gifted students: gifted children are smart, so they can get by on their own; gifted students excel in all school subjects; gifted students are a homogeneous group. The participants in this study seemed to have negative attitudes towards gifted learners in their regular classrooms.

CONCLUSION

The participants in this study seemed to have negative attitudes towards gifted learners in their regular classrooms. This confirms what Pajares (1996) stated about people engaging in what they feel confident competent about and avoid those which they are not. The above results want us to recall what (Oswald & de Villiers, 2013) said about South African teachers who were interviewed in regard to gifted education. Similarly, (Mhlolo, 2017) affirmed that the gifted learners are still not receiving adequate support in mainstream classes due to lack of teachers' training particularly in catering for such exceptional learners' needs. The results confirm that awareness plays an important role in schools where Sullivan (2017) declared that answers to questions revolving around gifted education would provide valuable information to form future educational policy, teacher preparation or professional development and classroom practice.

IMPLICATIONS

Based on the results presented above, teachers in this study seemed not to be prepared to teach the gifted learners in their mainstream classrooms.

The researchers emphasize the inclusion of gifted education at schools as Heller (2004) pointed out that the preparedness of parents, teachers, school counsellors and psychologists in dealing with the tasks of identifying and nurturing the gifted without fear or prejudice, remained a main concern. So, this paper recommends the continuing emphasis on teacher training in gifted education at higher institutions and as well as in-service training at school levels.

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**P16. CHALLENGES ENCOUNTERED BY INTERMEDIATE PHASE
EDUCATORS IN IMPLEMENTING INCLUSIVE EDUCATION WITH
SPECIFIC REFERENCE TO MATHEMATICALLY GIFTED LEARNERS**

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ABSTRACT

South Africa like many countries worldwide, is currently practicing inclusive education in its schools. The fundamental principle behind the introduction of inclusive education (IE) was that all children would learn together, regardless of any difficulties or differences they may have. The learners to be encompassed in inclusive classes range from those with mild learning difficulties or social disadvantages to those with severe disabilities, those with temporary or more permanent learning problems, those with emotional or social problems, and those who are very gifted. However, in South Africa, implementation of inclusive education has been problematic with critics arguing that in its current conceptualisation it tends to favour the underachievers and the disabled while ignoring the unique needs of learners who are gifted. We cannot change this situation unless we start by understanding teacher preparedness to meet the needs of gifted learners. This study therefore aims at investigating the challenges encountered by Intermediate Phase Educators in implementing inclusive education with specific reference to mathematically gifted learners. This is important because 'What is honoured in a country will be cultivated there.' (Plato). So, unless we increase the quantity and quality of learners who can be the next generation of scientists, engineers and technical specialists, South Africa's vision for a sustainable democracy will not be achieved. The focus is on the knowledge of the teachers about inclusive education and the way educators cater for mathematically gifted learners in the classroom for all. A mixed method design will be followed in this study, involving ten schools from Umlazi district. At each school, two intermediate phase educators will be purposively sampled for the research. Checklist, classroom observation and interviews schedules will be used to gather information. Quantitative statistics will be used to analyse checklist responses, interviews and classroom observation will be analysed qualitatively. From the findings, it is hoped that the researcher will be able to draw some conclusions and make some recommendation that might assist regular classroom educators to proper modifying curriculum and instruction to enhance the learning of gifted learners.

INTRODUCTION

Since 1994, South African education policy was intended to transform the education system on a cultural and structural level from one that was bureaucratic, conservative, disempowering to one that was transformative, democratic, open and inclusive (Morrow, 2002; Powell, 2002). Historically, inclusive education has been a constant feature of UNESCO's work since the ground-breaking calls for *Education for All* in Jontiem, Thailand -1990 of which South Africa is a signatory. Since then there have been successive conferences which have maintained

momentum for the *Education for All [EFA]* movement, supported by global education monitoring (GEM) meetings, reports and agreements. The latest of these efforts has been the *Incheon Education 2030 Declaration and Framework for Action* (UNESCO, 2015) which recognised with great concern that 'we' are far from having reached education for all and set out a 'new vision for education' and corresponding implementation strategy, targets and monitoring schedules to achieve inclusive and equitable education.

Although through the Incheon 2030 Declaration, the world has set a more ambitious universal education agenda for the period 2015 to 2030, consensus does not exist about the nature and strategies to increase access, participation and improved inclusive education outcomes. In South Africa according to Bloch (2009), inclusive education policy initiatives have not succeeded in changing school and classrooms practices sufficiently. Critics have argued that the government has floundered in implementing its inclusive education program (Ngwena, 2013) thereby perpetuating the "apartheidisation of inclusive education." With specific reference to gifted learners Oswald & de Villiers (2013) concluded that gifted learners were receiving inadequate education, despite the country's propagation of democratic and inclusive education. Various factors have been attributed to this failure to successfully implement an inclusive education system but in this paper, we concur with Oswald & de Villiers (2013) who argued that for inclusivity to become a central part of the organization, planning and teaching at each school; teachers should have a sound understanding of how to recognize and address barriers to learning, and how to plan for diversity. According to UNESCO (1998), this challenge becomes even more formidable when classes contain students of different ages, classes are very large in size, teacher training is minimal, and physical or financial resources are severely limited. Given that teachers in South Africa were not trained on how to plan for diversity, it was important for us to find out how they are handling such inclusive classes.

CONCEPTUAL FRAMEWORK

The inclusion in a research of theoretical and conceptual frameworks is indispensable because they heighten the quality of a research. A research without the theoretical or conceptual framework makes it difficult for readers in ascertaining the academic position and the underlying factors to the researcher's assertions and/or hypotheses. Though these frameworks work hand in hand, they have characteristics that make them different from each other. They are different from each other in concept and in their roles in the research inquiry. This then pauses the question – when does a researcher opt for a theoretical framework or a conceptual framework? Briefly a theoretical framework is based on existing theory/theories in the literature which have been tested and validated by other scholars. It is used to test theories, to predict and control the situations within the context of a research inquiry. On the other hand, a researcher may opine that his/her research problem cannot meaningfully be researched in reference to only one theory, or concepts resident within one theory. In such cases, the researcher may have to "synthesize" the existing views in the literature concerning a given situation – both theoretical and from empirical findings. The synthesis may be called a *model* or *conceptual framework*, which essentially represents an 'integrated' way of looking at the problem (Liehr and Smith 1999). Such a model could then be used in place of a theoretical framework. So, it can be argued that conceptual frameworks are used in studies in which existing theory is inapplicable or insufficient.

We found this to be the case in our study on inclusive education. We could not locate a theoretical framework that would allow us to analyze inclusive practices with a focus on gifted students. The premise of inclusion is about providing an appropriate education for all students by providing the supports needed to achieve high standards. However, inclusive education in its current form is most often used when discussing the placement of students with disabilities. Our view is that effective inclusion should also be characterized by the awareness and celebration of student's cognitive strengths and weaknesses. In fact, cognitive abilities should be prioritized given that cognition is the basis for learning in the broadest sense. This paper then borrowed from Herrnstein & Murray's (1994) Bell Curve Model of Cognitive Abilities – Figure 1.

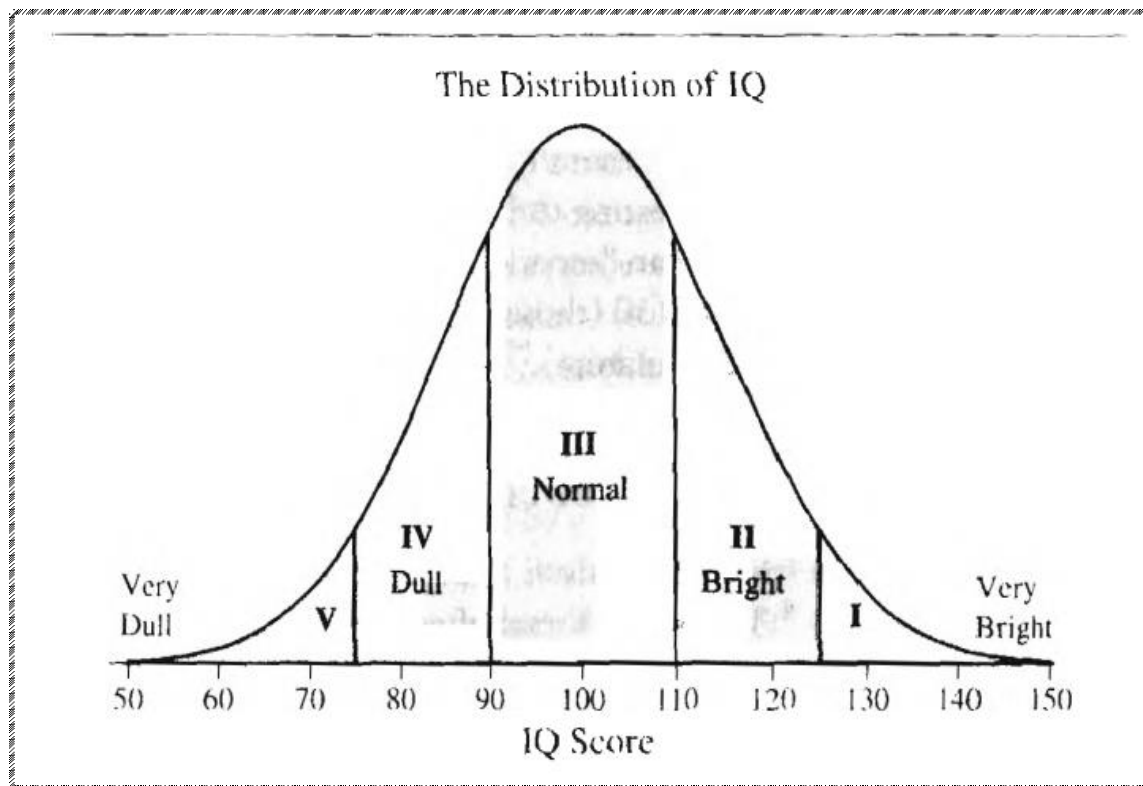


Figure 2 The Bell Curve of Cognitive Abilities (Herrnstein & Murray, 1994 p121)

Admittedly the Bell Curve was conceptualised in the context of Black vs White American education and for more than two decades many people rallied both in criticism and defence of the model, but this paper does not intend to dwell much on those areas of controversy such as race, nomenclature and cut-off points of intelligence. Instead our position in this paper follows Winegard & Winegard (2017) who have argued that in fact *The Bell Curve* is not pseudoscience. Most of its contentions are, in fact, perfectly mainstream and accepted by most relevant experts. Similarly, Hackman's (1995) recommendation was that in spite of the perceived disjointed nature of its argument, there are important lessons to be learned from the Bell Curve framework. So, what are those lessons, one might ask. Herrnstein & Murray's (1994) Bell Curve begins with fundamental and important assumptions, the first of which is that intelligence varies from person to person and that this is as universal and ancient as any understanding about the state of being human. The figure 1 shows how Herrnstein & Murray then went on to divide the world into

cognitive classes, five of them, because (a) that has been the most common number among sociologists who have broken down socioeconomic status into classes and (b) because five allows the natural groupings of "very high," "high," "mid," "low," and "very low." In the curve, they chose the nomenclature dull, very dull etc. because for them it was impossible to devise neutral terms for people in the lowest classes or the highest ones. Literate cultures everywhere and throughout history have had words for saying that some people are smarter than others. Hence none of these claims is new and each has been scrutinized repeatedly (Herrnstein & Murray, 1994). For example, UNESCO (1998) posit that teachers classify students' work as poor, satisfactory, good, very good, or excellent and in every class, there will be at least one student, or often a group of students, who achieve better grades and work outcomes than the rest, in one or more subjects. Herrnstein & Murray (1994) went on to argue that gossip about who in the tribe is cleverest has probably been a topic of conversation around the fire since fires, and conversation, were invented. Implications for practice are that education policies may fail not because they are inherently flawed but because they do not make allowances for how much learners vary. Their recommendation was that any policy in any area — education, employment, welfare, criminal justice, or the care of children — can benefit if its designers ask how their policy accords with the wide variation in cognitive ability.

In terms of the Bell Curve model's relevance to our paper, we argue that when the issue of inclusive education is raised, it is most often with regard to pupils who have one or more educational disadvantages or difficulties. It is not so often that consideration is given to corresponding needs of children with different kinds of high ability or gifted students. Because the Bell Curve places the cognitive abilities of learners on a continuum from very dull to very bright, it allowed us to conceptualise a more comprehensive view of an inclusive classroom. This view is consistent with the original Salamanca Statement & Framework for Action on Special Needs Education which states that: *"the guiding principle that informs this framework is that schools should accommodate all children regardless of their physical, intellectual, social, emotional, linguistic or other conditions. This should include disabled and **gifted children**, street and working children, children from remote or nomadic populations, children from linguistic, ethnic or cultural minorities and children from other disadvantaged or marginalised areas or groups."* (UNESCO 1994. P. 6 para 3). In terms of this cognitive diversity, and consistent with the Bell Curve theory, in every normally distributed inclusive classroom, there are three distinct groups of learners; the slower learners on the left-hand side, the bulk of the average learners in the middle and the advanced learners on the right-hand side. This scenario has implications for teaching and learning in inclusive classrooms. It means if we were to teach all learners effectively, our teaching or planning or material development must cater for the needs of the three distinct groups of learners. However, our observation is that teaching is centered on the learners that are slow and the average and, in some classes, the gifted students may be used as peer mentors to help teach the less able students in the class, rather than having their own learning extended (Henderson, 2007). Similarly, Winebrenner (1993) stated that in a class that has a range of abilities, it is the ablest, rather than the least who will learn less new material than any other. Practice also shows that learners who are not doing well and the average are the ones that most curriculums are designed for, leaving out the gifted in the current classroom designs and practices that we have (Glatthorn, 2000) yet teachers need to acknowledge the full range of abilities. The Bell Curve model also helped us to argue that every inclusive classroom teacher is a teacher of the gifted, and this is confirmed in the works of Gagné (2010) who argued

that in education systems that are guided by the inclusive philosophy, gifted learners spend most of their time in regular classrooms hence every teacher should be regarded as a teacher of the gifted.

A second assumption of the Bell Curve of Cognitive Abilities is that: "Whether we like it or not, [America's] future does depend on an elite that runs the country. Members of that elite are drawn overwhelmingly from the academically gifted". The success story of Singapore can be attributed to this 'elite' concept given that the Prime Minister's recruited the best and brightest people into his early government that sought to promote economic growth and job creation. Studies (Friedman and Martin 2011) and the longitudinal Studies of Mathematically Precocious Youth—SMPY (Lubinski et al. 2014) have confirmed beyond any reasonable doubt that academically talented males and females indeed became the critical human capital needed for driving modern day, conceptual economies. Research elsewhere has recognized that the abilities of the intellectual elite are a crucial ingredient for technological, economic, political and cultural development (Batterjee, 2017). La Griffe du Lion (2004) referred to this group of people as the 'intellectual class,' 'the gems of wisdom' or the 'smart fraction' of the population. In this context a 'smart fraction theory' has been used to also show that a nation's per capita GDP varies directly with the fraction of its population that is smart (La Griffe du Lion, 2004) and that gifted and talented persons are especially relevant for social development (Batterjee, 2017). A recommendation coming from such observations is that our future depends crucially on how we educate the next generation of people gifted (intellectual class or smart fraction) especially in the mathematical sciences. Therefore, Herrnstein & Murray (1994) suggested that much can and should be done to improve education, especially for those who have the greatest potential. Given that the potential contribution of the gifted and talented to the global economy is becoming increasingly important, policy makers and the leaders of business and finance express a growing interest in gifted education in its various formats. Similarly, in the more recent South African curriculum documents inclusivity is now foregrounded and the gifted learner is mentioned as one category of exceptionality that should become the central part of the organisation, planning and teaching at school (Department of Basic Education, 2011). Our concern for gifted students is triggered by such compelling observations.

A third assumption from the Herrnstein and Murray's Bell Curve of Cognitive Abilities is that general cognitive ability is an important predictor of a wide range of economic and life outcomes. High cognitive ability is generally associated with socially desirable behaviours, low cognitive ability with socially undesirable ones hence cognitive abilities are a better predictor of many personal dynamics. Herrnstein & Murray were certainly not the first to note that cognitive abilities strongly predict a variety of social outcomes, and today their contention is hardly disputable (Winegard & Winegard, 2017). If cognitive abilities are associated with socially desirable outcomes, the Bell Curve helps us to argue that any inclusive education system worth its salt should be driven by a desire to enhance the learners' cognitive abilities otherwise such a system would run the risk of being exclusionary. Literature confirms that failure to develop the learners' cognitive abilities can be viewed as another form of socially generated barriers that reduce the ability of the excluded individuals to interact with society (Klasen, 1998). In fact, Klasen (1998) argued that education can be exclusionary if the process of education fails to promote equal participation and access. It can also be exclusionary if the process of education fails to promote the 'development of the child's personality, talents, and mental and physical abilities to their fullest potential.' Current views about inclusive education are that inclusive classes should aim

to support the weakest, while encouraging the strongest to achieve their best (Soriano, Watkins & Ebersold, 2017). In this regard, Herrnstein and Murray concluded with the thought that since individuals differ in ability, a fair society in a procedural sense is very unlikely to be an egalitarian society in the sense of outcomes. One notable flaw within the current inclusive education practices is this egalitarian concern for the number of students not meeting minimal learning expectations with little regard for the advancement of students who already excel beyond that minimum threshold. However, critics warn that the promotion of the delusion that being present in a school equates with being socially and educationally included, is one of the most dishonest and insidious forms of exclusion (Cooper & Jacobs, 2011).

A fourth assumption of the Bell Curve is that while there is a heritability of cognitive ability, early environmental interventions can raise such cognitive abilities. Early interventions before middle school and high school are commonly recommended as the most powerful strategies to prevent students from dropping out, which in turn prevents disengagement (Hupfield, 2007). The conclusion that a well-run cognitively oriented early education program will increase the cognitive ability of low-income children by the end of the programs is one of the least disputed results in educational evaluation. So, in deciding to focus our study on the intermediate phase educators, we were guided by such compelling observations. A question which has raised much controversy is how early gifted programs should begin. Some researchers suggest identifying gifted students as early as pre-kindergarten (Gagné 2015) while others suggest delaying structured enrichment until at least Grades 3 or 4 (Rogers 1991). The idea of delaying identification is supported by evidence especially in the case of gifted students from disadvantaged backgrounds where it has been observed that many standardized tests used for identifying gifted students have a high language and cultural loading, which often negatively impacts performance in students of poverty or diversity who have less background knowledge or access to educational experiences (Benson, 2003; Ford, 2004). The under-representation of low-income, second language learning, and culturally diverse students in gifted and talented programs has led some researchers to argue that giftedness cannot be ascertained until third grade suggesting that it is better to wait until third or fourth grade to identify gifted students (Silverman, 1992). It is against this background, that the study focused on the intermediate phase school teachers.

STATEMENT OF THE PROBLEM

Inclusive education was arguably meant to cater for the needs of the diverse groups of learners in a normal classroom but disappointingly, inclusive education policies and practices may intensify experiences of exclusion and underachievement (Walton, 2016; Greenstein, 2016; Tomlinson, 2017). For example, recent reports by many task teams in South Africa showed that in practice, when teachers are designing and implementing curriculum, they tend to focus on the learners that fall on the left-hand side of the normal curve and the average learners in the middle leaving out the learners with potential on the extreme right-hand side. Such schools present an environment that fails to meet the needs of gifted students. Yet gifted learners matter most in our lives given that they have the potential to become the critical human capital that is needed to drive modern economy (Mhlolo 2017). This study is driven by recommendations made from many countries that are reviewing their curricula wherein the gifted learner is mentioned as one

category of exceptionality that should become the central part of the organization, planning and teaching at school (Department of Basic Education, 2011).

PURPOSE STATEMENT

The purpose of this paper is to explore the challenges encountered by intermediate phase educators in implementing inclusive education with specific reference to mathematically gifted learners in Umlazi schools in Kwazulu-Natal.

RESEARCH QUESTIONS

The following research questions were raised:

1. How is inclusive education defined in the original documents?
2. How is inclusive education defined and implemented by intermediate phase teachers within Umlazi district?
3. How does this affect learners who are considered gifted?

METHODS

Research Design

The study adopted a mixed method approach and relied on interviews, classroom observation and document analysis. The interviews and classroom observation in this research will be used to answer the RQ 2 & 3. The design gives in-depth details and narrative accounts from educators on the definition and implementation of inclusive education within Umlazi district schools, (Creswell, 2013). The semi-structured interviews will allow the researchers to get first-hand information about the implementation of inclusive education and how it accommodate and affect learners who are considered gifted.

The document analysis will be used to fill gaps left by the interviews. In this case the researchers treat the documents like a respondent or informant, (O'Leary, 2014). Therefore, the researchers will ask some questions then highlight the answers within the text. Document analysis will be reviewed to answer RQ1 on how inclusive education is defined in the original documents. The documents which are related to the study will be revealed. Documents like original Salamanca Statement & Framework for Action on Special Needs Education, (1994); Universal Declaration of Human Rights (1989); Jomtien Declaration (1990); Guidelines for Inclusion: Ensuring Access to Education for All, (2005).

Research Instruments

In this study, data will be collected using the checklist, structured interviews and classroom observation.

Population

The relevant target population of this research is the intermediate phase educators who teach Mathematics.

Sample

Only two mathematics educators from each of ten schools in Umlazi district will be purposively selected. The school which has more than two intermediate phase math teachers will be given some codes. Therefore, there will be a total of twenty educators who will take part as a research sample.

FINDINGS

Inclusive education's plan is to include all types of learners in one classroom. The guiding principle in the Salamanca Statement and Frame for Action on Special Education, (1994) confirm that schools should accommodate all children including gifted learners. Similarly, the 2005 Global Monitoring Report, emphasis that schools should be able to offer opportunities for a range of working methods and individualized learning in order that no pupil is obliged to stand out-side the fellowship of and participation in the school. That statement also allows gifted learners to be recognized in the classroom for all. World Education Forum Framework for Action, Dakar, (EFA goals) + Millennium Development goals, (2000) affirm and ensuring that all children have access to and complete free and compulsory primary education by 2015. Jomtien Declaration, (1990) ensure the World Declaration on Education for all. The findings made it clear that the original documents are they do consider the inclusion of mathematically gifted learners in classroom for all, but the problem is the implementer of inclusive education because of lack of information of how to cater for mathematically gifted learners.

CONCLUSION

It seems as if all the documents are promising to include mathematically gifted learners in the classroom for all. But nevertheless, the good idea is only on the papers because teachers who supposed to implement inclusive education are ill-prepared to cater for all different learners in the inclusive classroom. The department of education have a responsibility to reinterpret the inclusive education policy and improve the teachers' skills and knowledge to be the teachers' of every learner. This is important because if the teachers are not ready to teach all the children, mathematically gifted learners will always be neglected. In South Africa, teachers are not well prepared to teach gifted learners, (Oswald & de Villiers, 2013). On this grounds, we agree that in South Africa, teachers do not have an academic background of teaching gifted learners in the inclusive education and they are only depending on the ineffective departmental workshops as a training. These departmental workshops are only for some few hours. From the findings of this paper, we hoped that the researchers will be able to draw some conclusion that might propose in service-training for educators on inclusive education so that teachers can learn and be trained for how to cater for all learners including mathematically gifted learners.

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P32. TWO USEFUL PRINCIPLES FOR IMPROVING THE THINKING PROCESS DURING SOLVING PROCESS

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ABSTRACT

This work attempts to promote the use of two beneficial principles for improving the thinking process during problem solving in mathematics classes, especially during classes for exercises. This process should be well planned, thought-out and specified with well-chosen tasks and appropriate questions concerning the solving process and solution. Consequently, this should contribute, above all, to the possibility for students to obtain long-lasting knowledge while stimulating the process of creative thinking and understanding. In order to encourage students to investigate mathematical concepts on a deeper, more creative level, we should use rich, interesting problems that can be explored on a variety of levels and solved in a variety of ways and give students a chance to explain their reasoning to each other. We can ask them to try to create similar problems or tasks with similar solutions, patterns, generalizations and related problems. Well-chosen tasks and discussion given as examples can not only improve and empower the process of individualization and differentiation during doing mathematics but can also stimulate the process of creative thinking, understanding and adapting long lasting knowledge and motivate students in their current learning.

INTRODUCTION

Starting from the fact that school tasks, which are means and tool for teaching, serve as one of the means for both differentiation and modeling the processes of teaching, it is appropriate for the teacher to have a system of school tasks with different levels of difficulty. The main purpose is to provide students with increased possibilities for thinking, reasoning, solving problems and mathematical communication. We cannot expect the learning in the classroom to become more extensive or richer unless students are regularly, actively and productively part of solving cognitively challenging tasks.

FIRST PRINCIPLE – ASSESSMENT EXCEEDS QUESTIONING BASED ON BASIC MEMORY OR MEMORIZATION

Teaching students is a continuous process that includes entirety of ideas, information, algorithms, steps, procedures and experience. Learning is never an isolated event; it is always a constituent part of life experience and chronology of students' learning. Whenever we present a subject matter, we will have to incite students to build new connections and views. In addition, we have to help them build connections outside the subject matter, and by doing this we will

also incite them to make a comparison between the similarities and differences of this subject matter or text with others they have studied before. We also have to lead students to look at areas under discussion from the subject matter and connect them to other areas from other subject matters or events from their everyday life, and ask them whether those previous experiences influence their current way of thinking.

SECOND PRINCIPLE – THE TEACHER MUST HAVE A DETAILED PLAN TO GUIDE STUDENT’S THINKING

It is important for teachers to start developing a plan for presenting new material or revising which enables students to participate in various thinking processes. However, this plan must serve only as a guide because teachers must react to the flow of discussion in the classroom, changing their questions when necessary because of the reactions in the classroom. The problem for individualization of the person’s development and the individual approach to achieve this task, are of great theoretical and practical significance. By teaching it, the teacher raises a barrier towards traditionalism and inertia for leveling the students’ development. In the hands of the teacher, the individual approach is a tool to improve the overall effectiveness of the process of learning and educating. What students learn does not depend only on the manner of organization of the lesson, performed activities and working conditions, but on the level and type of thinking students are engaged in as well. If we make sure that chosen tasks provide different levels and types of thinking, then the cumulative effect of students’ experience with this kind of tasks will lead to implicit development of ideas for nature and the meaning of mathematics.

DEVELOPMENT OF TASKS DURING LESSONS

By introducing tasks in the classroom we can say that their life begins. Mathematical tasks, the moment they enter the classroom, are intertwined with the educational aims, intentions and interactions between the teachers and the students. Therefore, tasks should not be considered as problems written in math text books or in the teachers’ preparation, but should be considered as a classroom activity as well. Defined as activities, mathematical tasks in the educational process become connected and included in both training and teaching.

The stage of implementation of a mathematical task begins the moment students start solving it and continues until the moment the teacher and students begin solving a new task. The manner in which the task is solved in the classroom during the stage of implementation is influenced by both the teacher and students. During this stage, the cognitive requirements of advanced level tasks can be easily transformed into forms of thinking for students with lower level of requirements using different methods. In practice, the classification of tasks according to levels of difficulty is performed intuitively by the teachers, because, in fact, there is no criterion for synonymous teaching methods to determine the levels of difficulty of school math tasks. Tasks classified as tasks of advanced level should be used during mathematics lessons. The final fate of the advanced level tasks depends on the extent and the method in which the teacher supports the students’ thinking and reasoning. The teacher will keep the task’s advanced level if he persistently demands from his students to explain how they think about solving the task. But, if

the teacher rushes the students during the process of solving the task, by not giving them enough time to think or directing them towards the solution of the task, then, the task's level of cognitive requirements is decreased.

In doing so, tasks need to satisfy the following preconditions that teachers must follow as well:

- they must stem from the aims presented in the curriculum for the appropriate grade;
- they must direct student's attention towards problems that represents a system of complex tasks;
- they must incite creativity;
- they must lead students to ask questions;
- they must create interest for learning new content;
- they must incite exploratory inquisitiveness.

According to the level of cognitive demands, tasks can be divided into:

- Memorization tasks
- Procedures without correlation tasks
- Procedures with correlation tasks

DOING MATHEMATICS TASKS

When we determine the level of cognitive demands of a mathematical task, it is important not to get distracted by the task's unnecessary characteristics and to take into account the students for whom the tasks is intended.

There is another very important matter concerning assessing students' knowledge. Because teachers are the initiators of the process of examining students' knowledge, students usually react directly to the teacher. They observe him/her carefully and listen to what he/she says even more attentively, than to what their classmates say. If we want to establish a dialog in the classroom, then we have to change this kind of interaction between teachers and students. Namely, during lessons, teachers must change their role of commentators i.e. when students talk; teachers should incite conversation and discussion between students. Instead of one-to-one discussion with the teacher, the teacher should model the discussion i.e. incite discussion between students in which he/she will take part as a regular participant and not as a central figure.

Likewise, the teacher must not take the role of a dominant assessor who assesses students' answers. Instead of using phrases like: 'That is not correct.'; 'Yes, that is correct.' or 'Is that possible?', teachers should use : 'Does anyone else want to say anything about this?', 'Marko, what do you think?' etc. these questions help avoid dominant assessment thus enabling students to freely state their ideas.

Teacher's delivery of speech and prepared questions play an important role in the lesson. Teachers should use the standard language, the questions need to be concise and prompt students to think. The questions should be more like: 'Why do you think that?', 'How can we..? etc., and teachers should avoid questions like: 'Let's see what you have learnt', 'What did you learn for today?', 'Who can tell me ...? etc. Teachers must avoid using closed questions which students can only answer with 'Yes' or 'No' and examining the student who first raised his/her hand to answer questions posed by the teacher.

Another important question that we have to consider is the necessary amount of time teachers allocate after presenting the task. Research shows that there is a direct connection between the time teachers wait after they present the task and the students' level of thinking. The research points out that if teachers extend the allocated waiting-time, the level of thinking increases and the number of students who react rises as well. It is logical that if we pose tasks with high-level cognitive demands, then students need more time to think.

It is important to incite participation from all students in the stage of implementation of tasks. In order to achieve this, teachers must call by name less extrovert students, and sometimes even ignore students who think that they should answer every question. As soon as students begin to get used to real discussion, in which every idea is respected and considered important and there is not only one correct answer, they will want to express their thoughts and listen to other students' ideas. When students reach this level of mutual interaction in the classroom, guiding the discussion in which everyone takes part, becomes easier for the teacher and more natural for the students.

The topic of problems and problem solving is a fundamental topic in mathematics teaching. Intermittently, this topic is studied throughout the entire primary education, as well as later on.

Problem solving tasks are useful because they:

- Encourage mathematical thinking
- Stimulate curious children who want to explore
- Provide a mathematical record of problem situations and formation of mathematical models
- Foster love for mathematics and problem situations
- Encourage interest in challenges and assessments
- Stimulate creative thinking and students' motivation in their learning
- Acquiring long-lasting, structural knowledge among students

STAGES IN SOLVING TEXTUAL TASKS

1. Understand the task (read the entire task or parts of it, drawing, sketch, symbolic representation of the task). This is the invisible stage and teachers usually skip it.
2. Build an idea and devise a plan to solve the task (this stage is connected with understanding the task)
3. Practical implementation of the devised plan (mathematical operations and solving the equation)
4. Examine the obtained solution (creative and interesting questions related to the task are asked addition)

EXAMPLES OF TASKS WITH HIGH THINKING LEVEL

1. 25% of 15 more, less or equal to 15? S: It is less than 15. Look the explanation, think about it and explain the right solution!

T: How do you know?

S: By subtracting: $25\% - 15 = 10$, and 10 is less than 15.

2. Nela has got 564 denars. She got 236 more denars from her mother. She wants to buy a bag that costs 1000 denars. How much more money does she need?
3. 246 letters and 85 more postcards than letters were received in the post office. 110 fewer packages than letters were received. How many total items (letters, postcards and packages) were received in the post office?
4. Find the difference between the number 9 and the predecessor of 3.

DETECTING PATTERNS

Ann is having a birthday party. The first time the doorbell rings, one guest enters. The second time the doorbell rings, three guests enter, and the third time the doorbell rings, five guests enter. On each successive ring the group entering is two more than the previous group.

- a) How many guests will enter on the 5th ring?
- b) How many guests will enter on the 10th ring?
- c) 19 guests entered on one of the rings. What ring was it?

MATHEMATICAL "TRICKS"

Think of a number.	x
Add 5.	$x+5$
Multiply it with 2.	$2(x+5)=2x+10$
Subtract 8.	$2x+10-8=2x+2$
Divide it with 2.	$(2x+2):2=x+1$
"Tell me the number you got, and I'll tell you the number you started with."	x

Asking students to explain and justify their mathematical thinking

Students who are required to explain and justify their own thinking achieve greater success compared to students who are not asked to explain how they solve the task. Here is an example of how a student can explain and justify his thinking.

Example:

$$23 + 28 + 25 + 24 = 100$$

23, 28, 25 and 24 are four numbers that are close to 25, the sum of which is

If I take away 2 from 28 and add them to the number 23, I get 25. If from the remaining 26 I take away 1 and add it to the number 24 I get 25. Now I have four 25s, i.e. $25 + 25 + 25 + 25 = 100$

Also, the student's explanation enables us to observe whether he/she understands the implemented procedure and whether he/she can replace it or connect it to another procedure.

TASKS INVOLVING THINKING

- There are 6 people in a room. Each and every person shakes hands with each other only once. How many handshakes will there be?
- There are 470 students going to a play. One teacher is assigned for every 30 students. How many tickets are needed? How many tickets will be needed if 21 students is absents? Why? Explain your answer
- Students should know how to solve the task, and also they should be able to modify new tasks, changed conditions or other parts of the solution to the task.

PROBLEMS

- *Students THINK and successfully solve not only math problems but other real, problem situations*
- *Students learn to communicate mathematically*
- *Students think mathematically and creatively*
- *Students learn to value mathematics and seek it in their surroundings*
- *Students gain self-confidence that they are successful and know mathematics*

CONCLUSION

Knowledge is more valuable if we can implement it under different conditions and in different new situations.

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