Contested Knowledge: A Critical Review of the Concept of Differentiation in Teaching and Learning

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Abstract This paper explores the concept of differentiation in teaching and learning. It argues that theoretical perspectives, policies, frameworks and the implementation of ideas relating to the technique have become conflated, because of the contested nature of the term. This has led to increased inequality in the classroom, which is the opposite result of its intended purpose. The unevenness of differentiation is most apparent in attempts to improve the attainment of individual students and tailoring the curriculum to meet their needs. Even though differentiation appears to be a successful framework on the surface level, with deeper analysis, it is rather difficult to quantify the real benefits, as non-school factors such as the influence of culture, socio-economic background, gender, ability/disability, language and social class have an effect on the outcome of learners' educational achievement. Consideration of factors such as these on individual students could provide greater insights and help schools build a platform for more inclusive differentiated learning. This paper suggests that, for differentiation to be successful, teachers should make accommodation for learners' varied levels, needs and backgrounds. Moreover, this paper highlights the need for more research-led strategies aimed at closing the attainment gap among learners, particularly where differentiation fails to challenge existing learning paradigms.

Keywords: Differentiation; Gender; Social class; Culture; Education; Attainment

INTRODUCTION

Differentiation is a framework or philosophy to enable students of all levels to attain their full potential (Munro, 2012). Achieving this centres on the acquisition, processing, construction and exposition of knowledge and the rationalisation of ideas (Munro, 2012, Brighton *et al.*, 2005; VanTassel-Baska and Stambaugh, 2005). Moreover, it involves the development of teaching materials, assessment procedures and an innovative curriculum, which lays the foundation for fulfilling the unique needs of all learners irrespective of their abilities and existing attainment (Brighton *et al.*, 2005; Hertberg-Davis, 2009). As studies show, effective use of differentiation can help to increase students' motivation, academic achievement and constructively build on students' previous knowledge (Munro, 2012 and Konstantinou-Katzi, 2013). However, teachers, particularly those who are new to differentiation, often misunderstand the technique, applying it as a form of 'scaffolding' for weaker learners or as a group work strategy (Hertberg-Davis, 2009). Differentiation also tends to be deployed as a tactic to hinge group tasks on gifted learners to ensure they are accomplished or to use them to tutor other students

or as a method for adulterating high-level content to achieve inclusivity or enjoyable lessons (*ibid*., 2009).

Although today's classrooms are highly diverse aligned to class, socio-economic background, gender, culture, language and abilities/disabilities, it appears students are being failed, because their individual needs were not being met (Brighton *et al.,* 2005; Department of Education, 2014; Thomsen, 2012; Civitillo, Denessen and Molenaar, 2016). Additionally, there is little consideration of factors such as students' level of preparedness, interest, motivation and learning profiles (Hertberg-Davis, 2009). While the differentiation framework seeks to address such classroom heterogeneity and challenges, however, studies suggest some teachers were reluctant or not equipped to instigate its implementation (VanTassel-Baska and Stambaugh, 2005; West and West, 2016). Teachers were often too saddled with classroom management concerns or had little or no training in the use of differentiation techniques and, therefore, lacked confidence, efficacy and perseverance in its application (West and West, 2016). Instead, many teachers tend to plan lessons aimed at students in the 'middle' perpetuating a generalised 'one size fits all' approach that does not account for the vastly varied needs of a pluralised classroom (Brighton *et al.*, 2005, p.9; Hertberg-Davis, 2009, p.251; Wu 2013, p.130; Westwood, 2013). Therefore, rather than being known for providing a multifaceted programme of activities capable of meeting the individual needs of students, differentiation is often labeled as a support mechanism for weaker learners, which does little to challenge the abilities of more able learners (Hertberg-Davis, 2009; Westwood, 2013).

Teachers often agree that differentiated instructions play a pivotal role in meeting the varied needs of learners (Burkett, 2013). However, Dixon *et al*. (2014) argue differentiated teaching requires practice. Teachers' experiences and skills in adapting lessons to fulfill students' varied learning needs are paramount to successful implementation of teaching and learning framework such as differentiation (Dixon *et al*., 2014). However, Civitillo, Denessen and Molenaar (2016) postulate that teachers' perception of classroom diversity is wide and varied, impacting individuals' understanding of differentiation and its application. Furthermore, Hertberg-Davis (2009) argues that misunderstanding of differentiation, particularly, among new teachers can lead to the classroom being less challenging for some learners. Consequently, training providers and schools should provide professional development to support differentiation. Teachers should be mentored and be provided with the opportunity to observe each other's differentiated lessons, give feedback after observation as well as being given the time to collaborate resources for effective differentiation (Dixon *et al*., 2014).

In examining the various perspectives, policies, frameworks and implementation strategies associated with differentiation, this article deepens understanding of its application in teaching and learning. Moreover, the article supports calls for more extensive research, which could add insights into the various factors that can impact the implementation of differentiation in the classroom (Dixon *et al*., 2014; Terwell, 2005). This could provide a basis for further development and training to ensure greater effectiveness and sustainability of the method. With limited knowledge of its operation and value, use of differentiation not only adds to an increased workload for teachers, but also means it remains a contested teaching and learning strategy. Discussion begins by defining differentiation, an outline of theories of knowledge and then considers implementation of strategies. The article further explores factors influencing differentiation, the benefits and contestation of the practice, before making concluding comments.

DEFINING DIFFERENTIATION

Differentiation is a contested concept, which is used in fields such as marketing, medicine and mathematics. The term's delineation is particularised to each domain as it is in education where differentiation essentially means tailoring teaching to attend to a specific student's needs and the way they learn (VanTassel-Baska, 2012). In essence, differentiation is a way of thinking about teaching and learning (Tomlinson, 2008). The premise is that schools should not affirm to students achieving prescribed norms, but should aim to enable them to maximise their potential (*ibid.*).

Moreover, students should be facilitated to develop as rapidly as possible, not only learn requisite content, but to also assume responsibility for their own lives as learners (*ibid.*). The intention is that by acquiescing to the individual needs of each student will allow them to progress at or beyond an expected standard (McNamara and Moreton, 1997). This can be achieved by differentiating learning materials, activities and how the student is being taught (Geelan *et al.*, 2015). While this may appear a straightforward process, an array of definitions, methods of implementation, misunderstandings and the pervasiveness of criticism among educators have rendered differentiation a contested concept (Pollard and Filer, 2007; Brighton *et al.*, 2005; Terwell, 2005). At its root is the conflict between traditional approaches to teaching and the concept of differentiation (Brighton *et al.*, 2005). While conventional teaching places teachers at the centre of the classroom, differentiated philosophy situates the student in this position (*ibid.*). Similarly, it was the role of the teacher to direct learning; under differentiation, the teacher facilitates learning (*ibid.*).

Differentiation can be linked back to Vygotsky's (1978) intervention theory, which centres on the importance of focusing on learners as individuals and support for their academic achievements rather than on the curriculum (Daniels and Hedegaard, 2011). This child-centred approach, as opposed to a generalised curriculum focus, is the critical dimension that underpins Vygotsky's theory. In this context, facilitating more or improved intervention is not necessarily the best strategy (Vygotsky, 1978). Instead, there should be greater focus on supporting children's assimilation of classroom practices, participation and contribution to their individual development (Daniels and Hedegaard, 2011).

Vygotsky's (1978) ideas have been reinforced by Gardner's (1993) '*theory of multiple intelligences'*. Gardner (1993, p.56) believes there should be greater focus on 'individual-centered education', tailored to meet the needs of each child with specific focus on weaker areas of intelligence. In contrast to Vygotsky's and Gardner's theories, differentiation in the contemporary classroom seeks to promote greater scaffolding of teaching and learning based on learners' target grades rather than being used as a supportive approach concerned with individual needs and abilities (Hertberg-Davis, 2009). Tomlinson (2001) argues that differentiation is no longer regarded as the individualised approach as intended in the 1970s. The uncertainty has been heightened, as both themes are often used interchangeably, further exacerbating the misinterpretation of the central notion of differentiation.

In contemporary education, differentiation is delineated as a technique for facilitating learners as unique individuals, providing the opportunity for optimal learning (Petty, 2004). On the other hand, Terwell (2005) refers to differentiation as streaming, tracking or grouping students based on ability. The main purpose of differentiation is to bolster greater understanding of the requirements of children with Special Educational Needs (SEN), and, therefore, tailoring the curriculum to fulfil them. This indicates disparity and misconception of the purpose of differentiation. While Petty (2004) argues that differentiation should be for individualisation, Terwell (2005) contends it should be a technique for segmenting learners, not as individuals, but based on ability in comparison with their peers. The various recognitions of differentiation and its approaches indicate the need to question its uses and

evaluate whether successes in students' performances really can be linked to differentiation or whether it is due to other intrinsic or extrinsic factors.

The objective of differentiation is to encourage teachers to adapt their teaching, learning and assessment practice (Vickerman, 2009). As part of the Department for Education *Teachers' Standards*, teachers must adapt teaching to respond to the strengths and needs of all pupils. This includes knowing when and how to differentiate appropriately and using approaches, which enable pupils to be taught effectively (Department for Education, 2011).

However, there is no definitive guidance on how this might be achieved. Instead, individual teachers have to decide what they consider to be best practice in different learning environments. Even though teachers are usually best placed to understand the needs and abilities of their students, Terwell (2005) contends that variations in experiences, understanding, organisational culture and resources in differentiation, have led to the emergence of inequality in classrooms. In the same vein, several aspects of differentiated instruction and assessment challenge the belief of fairness among teachers and contradict beliefs commonly held by society (Brighton *et al.*, 2005).

While the Mariam Webster online dictionary (2016) definition of differentiation is rather concise - '*the process of* differentiating', other definitions are more expansive. According to Vickerman (2009) differentiation includes a range of teaching strategies and methods used by teachers to teach diverse students with varied needs in the same learning environment. Differentiation is widely viewed as a strategy for improving students' attainment by adapting the curriculum to meet the varied needs of learners (Lawrence-Brown, 2004). Schools' senior leadership teams, inspectors from the Office for Standards in Education, Children's Services and Skills (Ofsted) and education policy makers often regard differentiation as a valuable addition to teaching and learning. They believe differentiation positively impacts classroom experiences, leading to improved attitude to learning, better skills and ultimately, better student outcome (Brighton *et al*., 2005).

On surface level, it would be difficult to argue against the concept of differentiation (Brighton *et al*., 2005). Certainly, students benefit greatly when tasks are geared to match their individual learning needs (Brighton *et al*., 2005). Furthermore, Hertberg-Davis (2009) believes, differentiation is an ideal form of fulfilling the needs of gifted learners, a perfect remedy for resolving the issue that has affected gifted education for several years and is still mainly unresolved.

The notion of differentiation is often misunderstood and is regularly regarded by teachers as 'scaffolding' for weaker learners and not as a framework for fulfilling the unique needs of all learners regardless of ability (Davis, 2009). It may be argued that differentiation is a technique for addressing inequality in the classroom, defeating the perceived purpose of its intended aim. Furthermore, Weber *et al*. (2013) argue that teachers, in general, find differentiation complicated and challenging to implement. Similarly, Barthorpe and Visser (1991) suggest that differentiation is regularly used without full consideration of its meaning and that its implications are usually misunderstood. Do the merits of differentiation really outweigh the implications that positively enhance the uniqueness of individual learners?

THEORIES OF KNOWLEDGE AND DIFFERENTIATION

Knowledge can be either explicit or tacit (Eraut, 2000). Explicit knowledge, also known as codified knowledge, is regarded as information that is widely known and is usually recognised by its origin and epistemological status (Eraut, 2000). Tacit knowledge is subconsciously stored and used without

cognisant thought (Dudley, 2013). Tacit knowledge is also defined as being qualitative, not discursive, unconscious, while explicit knowledge is conscious, discursive and open (Schilhab, 2007). In an educational setting, Elliot *et al*. (2013) argue that mentors are able to guide mentees using their acquired skills and knowledge. Even though this is often very straightforward for routine tasks, it may be more problematic when the complexity of professional knowledge increases (Elliot *et al*., 2013). This is because such understandings are usually gained through experience or 'tacit knowledge' and are often difficult to articulate (Edmondson *et al*., 2003).

The suggestion is that knowledge is coded in organisational language or 'externalised' and not explicit for teachers to fully comprehend (Nonaka and Krogh, 2009). This is often evident in the inability of senior school leaders to guide teachers to effectively implement differentiation strategies. Although they may have in-depth tacit knowledge of how to differentiate and are able to implement these in their own teaching and learning approaches in the classroom, senior leaders may be unable to get this knowledge across to other teachers (Munro, 2012). This is reflected in Polanti (1966), cited in Elliot *et al*. (2013, p.85), who postulated that 'we can know more than we can tell'. In this context, Munro (2012) argues that there is limited knowledge by management on how to provide effective guidance for differentiation, which has resulted in the approach being seen solely as the responsibility of teachers.

In relation to differentiation in teaching and learning, the Department for Education (DfE) *Teachers' Standards* argues that teachers must adapt teaching to respond to the strengths and needs of all pupils. This includes knowing when and how to differentiate appropriately, using approaches that enable pupils to be taught effectively (Department for Education, 2011). However, the DfE propositions appear to be based on systemised concepts with information drawn from a combination of knowledge sources (Eraut, 2000; Nonaka and Krogh, 2009). Such an approach can impede the implementation of differentiation in the unfamiliar surrounds of the classroom (Eraut, 2000). The implication is that while the DfE recommends differentiation as an important teaching and learning framework, no explicit guidance is offered on how this may be achieved. Instead, individual teachers have to use tacit knowledge to decide what they consider to be best practice in different learning environments. This serves to exacerbate the contested nature of differentiation as an effective approach for teaching and learning.

IMPLEMENTATION OF DIFFERENTIATION

According to Weber *et al.* (2013) there are three factors to be considered with the implementation of differentiation These are: support teachers need to enhance their confidence in the approach, enhance ways in which classroom practices contribute to the execution of differentiated techniques and attributes that may improve or impede the introduction and development of differentiation (Weber *et al*., 2013). Central to effective implementation of differentiation is collaboration and co-operation (McNamara and Moreton, 1997). This requires guidance, support and leadership of experienced and highly skilled practitioners, who are essential to ensure efficiency of the strategy across all curriculums. However, differentiation is regularly regarded solely as the responsibility of teachers (Burkett, 2013) who are not always supported or guided by school leadership in applying differentiated approaches, and, too often, there is limited knowledge by management on how to provide effective provision for differentiation (Munro, 2012). Furthermore, for differentiation to be successful, Peter (1992) suggests that senior managers should restructure the way staff and students organise their work. Moreover, senior managers should initiate in-depth planning and provide ongoing support for teachers as part of its differentiation technique (Peter, 1992).

Lack of supervision means the implementation of differentiation fails to deliver the desired assistance and challenge for students. Peter (1992) argues that this is because teachers require extra time and effort, particularly, as differentiated instructions, tasks and assessments are very complex. Moreover, considerations such as class sizes, planning time, resources, increased teacher responsibility and arrangement for collaboration with colleagues must be taken into account for consistent application and effectiveness of differentiation (Brighton *et al.*, 2005). Senior school leadership must also consider intervention, assessment, time and involvement outcomes in support of differentiated techniques (Barthorpe and Visser, 1991). However, a lack of direction has led to limited coherency among teachers and infrequent and largely unsuccessful attempts at the implementation and use of differentiation (Munro, 2012). This means that even though teachers may be able to provide in-depth explanation of differentiation, they struggle to execute it in daily practice (West and West, 2016).

BENEFITS OF DIFFERENTIATION

Differentiation in teaching and learning assists teachers in addressing the issue of dealing with learners of varied abilities and responding to their individual needs (Konstantinou-Katzia, 2013). Effective use of differentiation has been associated with increased learner motivation, higher academic achievement and greater collaboration among students with similar ability (McNamara and Moreton, 1997; Gentry and Owen, 1999; Hertberg-Davis, 2009). Educators are increasingly recognising the use of effective differentiation to fulfil the needs of each learner. Moreover, successful differentiation can fulfil the varied needs and abilities of students in the same classroom (Haelermans *et al.*, 2015).

It is argued that differentiation can play an influential role in nurturing identified talent in gifted learners (Hertberg-Davis, 2009). Moreover, differentiation allows students to progress at a pace suitable for them regardless of their knowledge, skills or previous understandings (Wu, 2013 and Valiande *et al.*, 2011). Differentiation, it is held, can provide a platform for innovation and ongoing reflection that boosts teaching and learning that would not be readily available in the form of 'one size fits all lessons' (Valiande *et al.*, 2011).

FACTORS IMPACTING DIFFERENTIATION

While the aim of differentiation, argue Tomlinson (2001) and Valiande *et al*. (2011), is to consider a more student-centred approach in teaching and learning, practitioners often fail to take account of other non-school factors that can have significant influences. These include social class (Hatcher, 1998), socio-economic background (van der Berg *et al*., 2002), gender (Berggren, 2008) and culture (Thomsen, 2012). Furthermore, Demack, Drew and Grimsley (2000) suggest that the increase in attainment difference among students based on social class and gender was a major cause for concern. In this context, Considine and Zappala (2002) have argued that attention to these factors on an individual basis can provide greater insights and help schools build a platform for more inclusive differentiated learning. Moreover, due to the inherent nature of tacit knowledge, teachers and policy makers do not appear to have an explicit understanding of how to apply in-depth differentiation and the best process for successful implementation to positively impact students with varied needs and backgrounds.

Social Class

Social class significantly impacts academic ability, pupils' self-confidence and the selection of educational institutions (Hatcher, 1998). Even when students from different social class display similar abilities, those from more advantaged backgrounds tend to achieve better academic results (Hatcher, 1998). This suggests that despite teachers' successful implementation of differentiation in the classroom, social class remains a persistent influence on the final educational achievement of students. Micklewright (1988) argues that while deploying techniques such as differentiation was an attempt by schools to 'bridge the gap' between students and to improve learning for all pupils, it failed to contribute to increased equilibrium. This indicates that social class and parental education significantly impact academic results even when the quality of teaching and ability are consistently controlled (Micklewright, 1988).

The influence of social class on academic results has blurred the actual effects of differentiation in education achievement, raising questions about its value as a teaching method. This fuzziness, argues Croxford (1994), means further investigation is necessary to understand exactly what differentiation adds to the teaching repertoire. Furthermore, as part of the differentiation process, learners are usually grouped together based on abilities. However, it is an approach that appears flawed. Neumeister *et al*. (2007) argue that class-based premises clouded teachers' judgment of gifted learners. Contextually, it would be difficult to judge the correct impact of differentiation on learner outcome. Furthermore, Haelermans (2015) asserts that the correlation between students' characteristics and other unobservable factors makes it difficult to determine the precise impact of differentiation.

Socio-Economic Background

There is a distinct correlation between students' academic achievement and their socio-economic background (Bakker, 2007). In particular, students from families with higher socio-economic background usually have superior academic outcomes than those with lower socio-economic status (Considine and Zappala, 2002). Similarly, van der Berg *et al*. (2002) argue that children from wealthier or highly educated parents make better progress and often outperform students from poorer backgrounds. As such, there appears the need for deeper scrutiny of education provisions rather than focus predominantly on what happens in the classroom. This is especially important, as students from lower socio-economic sets may display worse numeracy, literacy and comprehension levels, negative attitude to learning and more behavioural issues even when there are intervention activities by schools (Considine and Zappala, 2002).

These observations indicate that for differentiation to be successful, teachers need to make accommodation for learners' varied levels, socio-economic backgrounds and psycho-emotional characteristics, as these are critical components that may affect learning (Valiande, 2012). This poses the crucial question as to whether teachers are equipped with the skills and knowledge to facilitate the deficit caused by being from disadvantaged backgrounds through the provision of effective differentiated tasks or instructions for individual learners. Certainly, as these various viewpoints suggests, there needs to be greater emphasis on support and motivation for students to succeed regardless of the teaching methods deployed in the classroom.

Gender

There is a significant difference in educational achievement of students based on their gender, particularly those from lower socioeconomic backgrounds (Considine and Zappala, 2002). A major challenge for educators in the 21st Century is issues relating to gender (Aldridge, 2009). Gender inequality, argues Biemmi (2015), is a prominent feature in the education system. Although schools are considered one of the few places where equality might be achieved, lack of investment in policy could inhibit this potential (*ibid.*). This, according to Virtanen, Räikkönen and Ikonen (2014), has led to a major issue for differentiated teaching, as there are apparent differences in students' motivation based on gender.

According to Biemmi (2015) perception of different subjects between genders can be linked to degree choices and jobs. This impacts attitude towards learning certain subjects, as learners are more inclined to choose fields regarded as socially accepted for their gender (*ibid.*). This suggests that despite the best efforts of teachers, students may indicate a lack of motivation to study particular courses. Although, there is some evidence of effective differentiation to improve achievement in areas such as gender and poverty, the actual effect is difficult to quantify (Strand, 2010). Furthermore, it would be a misrepresentation of information to state that differentiation can be effective and can improve progress without considering factors such as gender and poverty.

Even though inclusive teaching plays a significant role in dispelling the traditional gender specific expectation, there still remains uncertainty about teachers' ability to effectively differentiate for the varied characteristics of learners (Westwood, 2013). This indicates that there needs to be further analysis on the impact of gender in implementing effective differentiation across a range of curriculum. In addition, Biemmi (2015) argues that the operation of perspectives such as differentiation in closing the gender gap in education needs to consider, not only teaching activities, but also a critical appraisal of academic culture and curriculum development.

Culture

Teachers are responsible for educating themselves about the different cultures and customs of students to be able to effectively deliver to multicultural classes (Westwood, 2013). As part of their differentiation technique, teachers must include methods and topics that interest learners from varied cultures. However, there appears little evidence of training being offered to teachers to enable them to understand and develop the relevant expertise to meet cultural variations among students. The need for training in understanding different cultures to enhance classroom practice is especially important. Brighton *et al.* (2005) suggest schools and teachers are finding it increasingly challenging to integrate learners from different cultures. One of the reasons for this is because schools and teachers do not have knowledge of what happens in the homes of individual students (Singh, 2008).

Within certain cultures, education is seen as the 'means to an end' and students will work exceptionally hard in an attempt to achieve at the highest level, regardless of the way they are being taught or the resources available. However, in other cultures, particularly those with older generations who are highly educated, education has great strategic value; therefore those learners are encouraged to follow certain paths (Thomsen, 2012). In this context, it would be difficult to credit the role of differentiation with regards to the achievement of such students without taking into consideration the impact of family and cultural influences.

Transforming Teaching

Differences in culture can significantly impact students' reaction or behaviour towards certain activities or tasks in lessons. In addition, individual students from different ethnic backgrounds may vary in the way they see teachers in terms of indifference, disdain or respectability (Westwood, 2013). Therefore, for teachers to successfully implement differentiation and increase intrinsic motivation for learners of varied cultures, they need to understand the components of multicultural education (Neumeister *et al.,* 2007). Increased understanding can be gained from the use of case studies from different cultures to add insights to explanations and clarify ideas, the influence of people from different cultures on the development of knowledge, pro-actively seek to diminish prejudice, development of a teaching strategy that appeals to different learning styles and create a conducive learning environment that encourages and welcomes learners regardless of their ethnicity (Bank, 1993, cited in Neumeister *et al*., 2007). However, as these various debates regarding the influence of culture on educational attainment show, teachers might be aware of learners' potential, but are not adequately equipped or trained to ensure they are intertwined with differentiation techniques.

THE CONTESTATIONS OF DIFFERENTIATION

The concept of adaptive or differentiated teaching is a complex framework that demands continuous convoluted multitasking leading to excessive workload for teachers (Westwood, 2013). The practice of differentiation in day-to-day learning environments has been largely unsuccessful (Hertberg-Davis, 2009). This is rather concerning, as an approach that leads to excessive workload for teachers is likely to become unsustainable overtime (Westwood, 2013). Furthermore, trying to differentiate can be tedious for teachers exasperated by large class sizes, inadequate funding, negative attitude towards peers among students and lack of materials for effective differentiation (Westwood, 2013). In addition, it is very difficult to estimate the actual impact of differentiation on learner achievements as there is the need to consider the correlation of students' characteristics and other unobservable factors on academic outcome (Haelermans *et al.,* 2015).

The pressure of organising, researching and planning a range of instructions and activities to match varied learning needs in addition to all the other teaching responsibilities, will, ultimately, impact negatively on the quality of teaching (Galton *et al.*, 1980, cited in Peter, 1992). It would be almost impossible to accommodate for the range of variables that need to be considered in devising appropriate activities for individual learning needs (Galton and Williamson, 1992).

Moreover, if not closely monitored, differentiation may block learning opportunities for teachers and students, therefore, a more critical approach for curriculum development should be considered (*ibid.*). The most appropriate use of differentiation remains largely uncertain. In some cases, teachers use it as a scaffolding mechanism for weaker students with gifted learners not being fully challenged, but seen as anchors to ensure all tasks are completed (Hertberg-Davis, 2009). Even though teachers may be willing to adapt teaching strategies, they are often expected to implement differentiation with minimal support or training (Hertberg-Davis, 2009). In this context, it would appear there is the need for long-term professional development to promote enhanced teaching and learning through the use of differentiation.

Even though key enthusiasts of differentiation argue it is distinctly different from grouping, they are still unable to separate the two. For example, Tomlinson, a strong advocate of differentiation, admitted to Wu (2013) in an interview that grouping is a component of differentiation. Tomlinson also suggested that it was important that teachers are given time to develop an understanding to fully analyse how students progress academically (Wu, 2013). However, it would appear lack of funding,

and the pressures of training students for exams to enable them to meet societal expectations, means that schools are unable to afford that extra time for teachers. This is despite the fact that what is often required to aid learners success is additional support and encouragement (Westwood, 2013).

A further contestation of differentiation relates to ideas associated with theories of knowledge. Meeting the needs of a differentiated classroom requires teachers to draw tacitly from experience and practice to be able to react to individual student needs. In this sense, knowledge is used as an 'instrument' developed through 'trial and error, imitation, or model learning' as in teacher-training exercises (Toom, 2012, pp.625-626). However, this is contrasted with teachers, who, under instructions from their school's hierarchy, often have to use information or differentiated techniques drawn from educational bodies that are too codified or theoretically driven for implementation in the heterogeneous and ever-changing setting of a classroom. For example, a teacher might observe the mistakes a student is making in performing a skilful activity even though the teacher cannot express the explicit theory of action (Toom, 2012).

However, by identifying the errors, the teacher can guide the student to connect the elements of practice that already exist in their repertoire or to draw on their previous performances (Toom, 2012). In this context, the ability of the teacher to act spontaneously espouses creativity and innovation, which are the bedrock of differentiation in teaching and learning (Nonaka and Krogh, 2009; Toom, 2012). At the same time, however, knowledge from reports is often influenced by organisational culture, leadership, structures and incentive systems and can be 'fragile and fraught with uncertainty, conflicts of interests, and differences in mindset' (Nonaka and Krogh, 2009, p.640). Such inflexibility can be seen to inhibit the approach of differentiation. Crucially, while tacit and explicit knowledge should intertwine and be based on the same continuum (Nonaka and Krogh, 2009), they are often in conflict in relation to the implementation of differentiation in teaching and learning. It is a contestation, which not only adds to an increasing workload for teachers, but also augments inequalities in the classroom.

CONCLUSION

This exploration reveals there are benefits such as increased learner motivation when differentiation is implemented effectively in the classroom. However, it is very hard to achieve on a daily basis, because of the heterogeneous nature of most classrooms. Many practitioners believe there should be greater emphasis on inclusive and adaptive teaching that considers all learners in a common curriculum rather than focused on difficult-to-sustain, multifaceted programmes and activities in a classroom of mixed-ability students (Westwood, 2013). The contestation surrounding differentiation is that its uses and purposes can often lead to misunderstandings among teachers of how to best implement it. Therefore, it is regularly regarded as scaffolding for weaker learners, while leading to a less challenging learning environment for the more able learners (Hertberg-Davis, 2009).

There appears to be limited support or training, which is needed to support the sustainability of differentiation (Dixon *et al.*, 2014)   This suggests the need for extensive research, planning and implementation. However, with limited knowledge of its operation or value as a teaching technique, the concept of differentiation will remain contested. Its only quantified contribution is likely to be increased workload for teachers thus negatively impacting the quality of teaching (Westwood, 2013).

This article has revealed that the highly acclaimed framework adds to inequality in education based on the premise that one size fits all (Terwell, 2005). Moreover, the technique is hampered by large

class sizes, available resources and limited time. Within this context, the concept of treating each student as a unique individual learner is debatable. The article emphasises how theories of knowledge adds to the complexities of differentiation in terms of tacit and explicit knowledge. It argues that organisations such as the DfE propose various theories of differentiation, but offer no real guidance on putting their ideas into practice, leaving individual teachers to implement their own techniques, which add to the contestation of the approach.

Various debates such as Civitillo, Denessen and Molenaar (2016) and Haelermans *et al*. (2015) indicate that teachers might be aware of the impact of non-school and unobservable factors on teaching and learning, but are not adequately equipped or trained to ensure they are intertwined with differentiation techniques to achieve successful results. Within this context, teachers need extra time and effort to successfully implement differentiation. This is because tasks and assessments are very complex (Peter, 1992). Furthermore, class sizes, planning time, resources, increased teacher responsibilities and arrangement for collaboration with colleagues, must be taken into account for consistent application and effectiveness of differentiation.

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