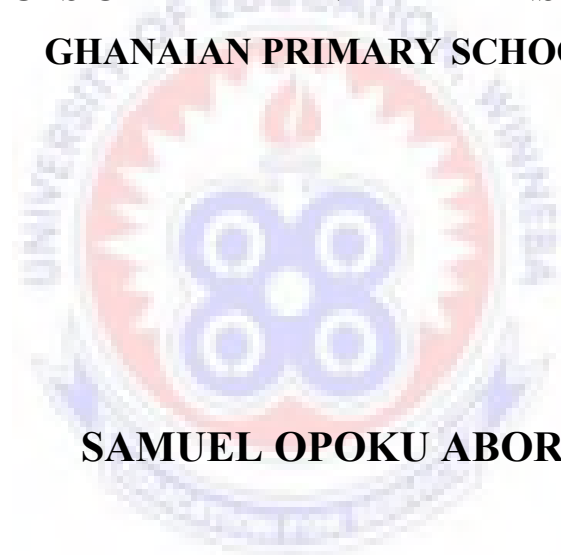


UNIVERSITY OF EDUCATION, WINNEBA

**INVESTIGATING TEACHERS' KNOWLEDGE AND
PRACTICES OF DIFFERENTIATED INSTRUCTION IN
GHANAIAN PRIMARY SCHOOLS**



SAMUEL OPOKU ABORA

JULY, 2015



UNIVERSITY OF EDUCATION, WINNEBA

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8130030004

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in Partial Fulfilment of the Requirement for Award of Master of Philosophy
(Basic Education) Degree.**

JULY, 2015.

DECLARATION

STUDENT'S DECLARATION

I, SAMUEL OPOKU ABORA, declare that this thesis with the exception of quotations and references contained in published works which have all been identified and duly acknowledged is entirely my own original work, and it has not been submitted, either in part or whole for another degree elsewhere.

Signature:.....

Date:.....

SUPERVISOR'S DECLARATION

I hereby declare that the preparation and presentation of this work was supervised in accordance with the guidelines for supervision of thesis as laid down by the University of Education, Winneba.

Name of Supervisor:.....

Signature:.....

Date:.....

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DEDICATION

I dedicate this work to the ever loving memory of my dear late parents, Samuel Yaw Abora (A.K.A Agya Anhwere) and Mary Ampong (A.K.A Abenaa Mununkum) and also to my late sister, Martha Antebea Antwi. I wish you were all alive to witness what the Lord has done.



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ABBREVIATIONS

| | |
|--------|--|
| CRDD: | Curriculum Research and Development Division |
| DI: | Differentiated Instruction |
| EFA: | Education For All |
| ESP: | Education Strategic Plan |
| FCUBE: | Free Compulsory Universal Basic Education |
| GoG: | Government of Ghana |
| IE: | Inclusive Education |
| MDG: | Millennium Development Goals |
| MI: | Multiple Intelligence |
| MoEYS: | Ministry of Education, Youth and Sports |
| MoE: | Ministry of Education |
| SAP: | Special Attention Project |
| SpED: | Special Education |
| SPSS: | Statistical Package for the Social Sciences |
| TLA: | Teaching/Learning Activity or Teacher/Learner Activity |
| TLM: | Teaching/Learning Materials |
| Tr.: | Teacher or an Interviewee |
| ZPD: | Zone of Proximal Development |

OPERATIONAL DEFINITIONS

Differentiated Instruction: A learner-centred instructional practice that incorporates several instructional approaches, methods, techniques, strategies, etc that address differing and diverse learning needs of every particular learner in the classroom based on their readiness level, interests and learning styles.

Knowledge of Differentiation: A teacher's understanding of the concepts, theories and generalisations of differentiated instruction.

Differentiated Practices: A teacher's ability to employ differentiated instruction concepts and practices.

Differentiated Environment: A school and/or classroom environment which is conducive for differentiated instruction practices, in which every category of learner is accommodated and helped to learn to his/her maximum potential.

ABSTRACT

The study sought to ascertain primary school teachers' knowledge of differentiation, assess teachers' pedagogical practices of differentiation, teachers' assessment practices of DI and to determine how supportive the primary schools' learning environments are of differentiation. A mixed method survey research design was employed to investigate Ghanaian primary school teachers' knowledge and practices of Differentiated Instruction. A sample of 100 primary school teachers from Kwabre East District was selected for the study, from which a sub-sample of 15 teachers were selected for classroom observation and interview. A questionnaire and a structured observation were used to collect quantitative data on teachers' knowledge and practices while a semi-structured interview was used to collect qualitative data. The descriptive statistics function of the SPSS was used to organize the quantitative data into frequency, percentages, mean and standard deviations where as the qualitative was analysed using thematic narrative approach. The findings indicated that the teachers variably possessed low to a higher level of knowledge on the aspects of differentiation. Teachers' level of knowledge were higher on *process* ($M = 32.90$, SD of 5.22), *product/ assessment* ($M = 22.13$, SD of 3.24) and *learner diversity* ($M = 20.08$, SD of 3.40) but average on *learner interest* ($M = 15.81$, $SD = 2.32$) and *learning environment* ($M = 15.78$, $SD = 5.60$) and lower on *lesson planning* ($M = 13.97$, $SD = 2.78$), *general theories* ($M = 13.92$, $SD = 3.53$), *content* ($M = 12.47$, $SD = 2.30$) and *learning styles* ($M = 11.02$, $SD = 2.56$). The findings further revealed that although there were traces of good pedagogical practices in the teachers' instruction, they taught to the middle. The primary school teachers scarcely differentiated instruction to address the learning needs of their learners. The teachers employed the traditional forms of assessment instead of alternative assessment strategies that addressed different learner needs. Also, almost all the primary school learning environments poorly supported differentiation. The study recommended that differentiation should be introduced to teachers and they should be supported to employ and practice it in their instruction.

CHAPTER ONE

INTRODUCTION

1.0 Overview

This chapter presents the background to the study, statement of the problem, the purpose and objectives of the study. It also deals with the specific research questions, significance of the study, limitations and delimitations of the study, definition of terms which have unique use in the study and finally the organisation of the study.

1.1 Background to the Study

The best pedagogical practices are those that consider all learners in a classroom *pari passu* the differences inherent in their academic, cultural, linguistic, and socio-economic diversity (Santamaria, 2009). Several studies (Tomlinson, 2004; Lawrence-Brown, 2004; Santamaría & Thousand, 2004; Launder, 2011) prove that the best practice that caters for learner diversities and differences is Differentiated Instruction (DI). This is because several researchers attest to the fact that DI provides all learners (the below average, the average, the above average, the strugglers, the gifted, the challenged, etc) opportunities to learn and grow to their fullest potential (Callahan, 2001; Cox, 2008; Powers, 2008; Manning, Standord & Reeves, 2010; Renzulli & Renzulli, 2010). Current studies (Lawrence-Brown, 2004; Santamaría & Thousand, 2004; Launder, 2011; Sakyi, 2014) also prove that DI is the best instructional model that incorporates all teaching approaches with the intent of helping every learner to effectively learn and fully benefit from instruction.

DI can best be described as a group of common theories and practices that consider learners' differences in background knowledge, readiness, language, learning style,

and interests; by teaching appropriately to these particular learner needs (Tomlinson & Kalbfleisch cited in Santamaria, 2009). DI also means process-oriented and a mixed-ability teaching approach which is most suitable to mixed-ability classrooms (Santamaria, 2009). In sum, the concept of DI is a learned way of thinking about how to treat each person in a group uniquely such that the success of each individual can contribute to that of the whole group (Tomlinson (2004).

Several studies (Anderson, 2009; Durrett, 2010; Palmer & Maag, 2011) affirm the usefulness and benefits of DI to both teachers and learners in the teaching and learning process. DI aids teachers to know their learners' learning interests and choices (Koeze, 2007), and it helps them to adjust and respond to their learners' developmental learning needs and styles (Logan, 2008). Launder (2011) posits that, DI is used to assist all learners with learning difficulties and challenge gifted learners. It also helps teachers to modify their lessons for remediation (Palmer & Maag, 2011). According to Valiande and Koutselini (2009) DI is used to solicit learners' interest, engage them actively in the teaching/learning process and sustain their learning interests. In satisfying the basic aim of educators to educate every learner in the classroom, DI modifies what learners learn to suit all learners per their abilities (Franz 2009). More importantly, DI helps teachers to create environments that make learners happy and successful (Logan, 2008). According to Franz (2009), DI helps every teacher who is confronted with the most challenging task of satisfying the diverse needs of his/her learners, vis-avis meeting standardised curriculum but aims to provide the finest educational opportunities and experiences for all learners. DI allows learners to have better access to the curriculum which in turn increases their knowledge and understanding of the content taught to them (Franz, 2009).

Servilio (2009) opines that DI entails meeting all learners' academic needs individually at their levels. This helps teachers to address the learning needs of each learner (Gangi, 2011). This happens when the classroom teacher targets the learner characteristics identified as readiness, interest and learning profile (Tomlinson, 2001). Gangi (2011) asserts that, the use of DI enables teachers identify the learning needs of each learner and meet them; by finding a way to match those needs so that they will be successful in learning (VanSciver, 2005). Likewise, DI helps teachers to contain learners who have mastered the lesson content, and are ready to be challenged when they teach to learners' readiness level by advancing their assignment (Gangi, 2011). And with the tools of DI, teachers can challenge the learners to learn as far as they can go towards further academic achievement and success (Levy, 2008).

According to Gangi (2011) and Anderson (2007), DI motivates learners to learn harder and exceed their main expectation when they are given the chance to choose learning activities. Again, mingling differentiated curriculum with learner choice is an ideal way to aid learners with disabilities as well as others to succeed in the same classroom (Servilio, 2009). Franz (2009) also confirms that since DI focuses on the abilities, strengths and learning needs of each learner, educators are able to supply effective instruction and produce utmost results. More so, learners' choices in DI that best reveal their unique individual abilities allow them to take responsibility for their own learning (Kobelin, 2009). This allows students to be independent and responsible learners throughout their learning endeavours. Painter (2009) also asserts that, learning becomes more interesting, fun and significant when learners are given the opportunity to choose their learning activities. This aids them to hasten their learning,

makes them good decision makers and responsible learners (Franz 2009). DI permits teachers to manage the individualities in their learners (Ysseldyke & Tardrew, 2007).

In another development, the use of DI is beneficial to teachers too (Franz, 2009). By increasing learners' independence, incorporating learners' choices, effectively monitoring learners' progress and adapting to their needs, learners and teachers are able to create an exciting and active learning environment that facilitate learners' learning (Franz, 2009). This perhaps reduces the teacher's workload at the long run as learners become independent and responsible learners (Franz, 2009).

According to Sondergeld and Shultz (2008), providing remediation for struggling learners and challenging gifted learners motivate teachers to create engaging, appropriate and beneficial learning opportunities for all learners without having them experience frustration. In this respect, the classrooms become active learning environments which change the roles of learners and teachers considerably (Franz, 2009). Thus, teacher's role changes to a facilitator of learning where as learners became more independent learners (Beecher & Sweeny, 2008). Moreover, Beecher and Sweeny (2008) declare that the DI concept which builds upon learner abilities, readiness and strengths through augmented learning experiences helps close learners' achievement gap drastically and thereby simplifies the teacher's work.

Present-day teachers do not only have to deal with the challenges of learners with disabilities but also learners with backgrounds of progressively cultural and linguistic diversity (Lapkoff & Li cited in Rock, Gregg, Ellis & Gable, 2008). A major

drawback of traditional instruction is that many teachers teach to the middle (Haager & Klinger, 2005), which compels the needs of several learners to go unmet.

These features of traditional instruction catalyze the failure of learners in standardized tests and augment high dropout rates, low graduation rates and high rate of unemployment (Lipsky, 2005). According to Rock et al. (2008), one solution to these problems proven by experts is differentiation. Rock et al. (2008) reveal that, learners become highly creative and flexible in their classroom activities and improve their attainments when instructions are differentiated. This also helps learners to know their strengths and learning needs (Rock et al., 2008). In effect, the ultimate motivation to the DI teacher is taking care of all learners by providing a learning environment and opportunities that exclude no child in the classroom (Anderson, 2007). Globally, DI is perceived as one major way of taking care of all diverse learners with diverse learning needs. It appeals to teachers to reconsider their classroom practices by engaging learners in the instructional processes to the benefit of all learners (Anderson, 2009).

The situation in Ghana might be quite different and discouraging. The government of Ghana (GoG) subscribes to Education For All (EFA) programme and posits that every child of school age should receive free and quality education (Ministry of Education, Youth and Sports [MoEYS], 2004; Ministry of Education [MoE], 2012, 2013).

Moreover, education delivery in Ghana is a right every child, and none is to be denied better and quality education (MoE, 2003; MoE, 2013). In this regard, the GoG seeks to educate all school age children through interventions such as Free Compulsory Universal Basic Education (FCUBE), EFA and Inclusive Education (IE) programmes among others (Gadagbui, 2008). For instance, the GoG aims to successfully

implement IE at the basic level and the MoE's Strategic Plan (2003 – 2015) envisions its achievement by 2015 (Casely-Hayford, Quansah, Tetteh, Adams & Adams, 2011).

The IE policy seeks to attain national and international goals of creating atmospheres for “addressing the diverse education needs of Ghanaians” (MoE, 2013, p. 5). The IE policy direction which makes education delivery in Ghana an undeniable right for all also “recognizes the varied learning needs of various categories of children of school age”. In this regard, the IE policy seeks to provide opportunities for all educators to “address the diverse learning needs” of every individual in the Ghanaian education system within a learner friendly atmosphere in order that every learner would have the “best possible opportunities to learn and have equitable access to quality teaching and learning” (MoE, 2013, p. 6). This should be done through appropriate curricula, teaching strategies and resource use (UNESCO cited in MoE, 2013).

In concordance with these, several studies (Gyimah, 2011; Agbenyega & Deku, 2011; MoE, 2013; UNICEF Ghana, 2014) reiterate the diverse nature of learners in the Ghanaian basic school classrooms currently and the need to cater for them. Again, several studies (Casely-Hayford et al., 2011; Gyimah, 2011; SAP, 2011) purport that IE (otherwise referred to as mainstreaming) is being pursued and implemented by some basic schools in Ghana. This is being done to fortify the need to cater for all learners of different capabilities to actively participate and engage in classroom teaching and learning through variations in methods of inclusivity (Gyimah, 2011). Notwithstanding this, differentiating instruction for inclusivity remains one of the aspects that is hardly given attention to in the Ghanaian education system (Kuyini, 2010). Also, teachers have very limited knowledge of inclusivity to effectively assist and manage such children in the basic schools (Casely-Hayford et al., 2011).

It has been reported that Ghanaian basic schools teachers have limited knowledge (Kuyini & Desai, 2006), inadequate skills of inclusive practices (Kuyini & Desai, 2007) and do not adequately support individual learners with diverse learning needs in generally overcrowded classrooms to help them to attain successful educational results (Kuyini & Desai, 2008; 2009). Thus, they employ more generic teaching practices as against few adaptive practices. They shun adapting curriculum to meet the diverse learning needs of learners (Kuyini & Abosi, 2014).

According to UNESCO (2005), the quantitative rather than the qualitative aspect of Ghanaian education has become the main focus of attention by policy makers. The Special Attention Project [SAP] (2011) also reveals that, children in Ghanaian basic schools who have difficulties in specific areas such as reading, writing, arithmetic and speaking among others are not formally recognised as children with special educational needs and no provisions are made to support them.

Alhassan (2014) also discloses that most of the teachers still rely mainly on 'old-deficit-medical' model of educating learners with special learning needs despite the call for new strategies that cater for their needs. Moreover, current pedagogical practices in Ghanaian education system are still dogmatic and do not value learner diversity and styles (GES cited in Agbenyega & Deku, 2011).

According to UNICEF-Ghana (2013), the Ghanaian education system serves those who readily fit into it, ignoring those with special learning needs who do not easily do so in the set structure. Also teachers in the Ghanaian education system do not effectively cater for the needs of pupils with learning difficulties in the regular

classrooms (Dotse, 2012; Gyasi, 2011; Henne, 2013; Thomas, 2012). Instead, some of them blame their learners for not understanding contents taught and as such subject them to severe punishments in order to compel them to work and learn harder (Agbenyega, 2006). Kuyini and Abosi (2014) further disclose that DI (which they call ‘Adaptive Instruction’) is a critical competence domain for teaching any category of learners with learning needs in regular classrooms: It is however significantly absent in the Ghanaian education system. Per these regular calls in paradigm shift from traditional methods of instruction to differentiation to suit learners’ educational needs there still seem to be very discouraging trends of the DI concept in Ghanaian educational system. Concerns for appropriate instructional practices such as these have prompted several researchers (Agbenyega, 2006; Gyimah, 2011; Kuyini, 2013; Kuyini & Abosi, 2014) to call on Ghanaian basic school teachers to adapt and differentiate instruction to cater for differing learner needs so as to help them access the curriculum and develop academically.

1.2 Statement of the Problem

In an ideal classroom, every learner would learn and understand the same content at the same time and in an exact same way. Teachers could teach a lesson once and every learner would understand the concept in the same way, at the same rate and at the same time and then progress to the next topic (Gangi, 2011). Unfortunately, learners are not like this and will never be. Rather, each learner has his/her own preferred way, appropriate time and a possible content of learning (Gangi, 2011).

Studies over the world indicate that classrooms today exhibit differences in race, religion, abilities, disabilities, background, interests and needs (Tomlinson, 2004). This worldwide problem of learner diversity is absolutely evident in the Ghanaian

educational system. Studies (Kuyini, 2010; Agbenyega & Deku, 2011; Kuyini & Abosi, 2014) reveal the diverse nature of these learners and the need to address them.

The GoG recognises these diversities (MoE, 2013) and the crucial role education plays (MoEYS, 2003); and as such seeks to educate every child through the FCUBE programme with its main policy goal of providing a quality basic education as well as learning opportunities for every school-age child in Ghana (MoE, 2003). The GoG again outlines a policy on IE and SpED which recognizes the varied learning needs of various categories of learners and the need to meet them (MoE, 2013). This policy is guided by the principles that all children can learn irrespective of their differences, all children have the right to access basic education and the need for the education system to adapt to the needs of the children. In addition, the mission statement of the MoE is to provide relevant education to all Ghanaians at all levels MoES (2012).

Significantly, various preambles of the National Syllabi for all the subject areas for Ghanaian basic schools remind teachers of the physical and intellectual diversities of their learners in the classrooms as well as their challenges (Curriculum Research and Development Division [CRDD], 2012). They categorically state that as a teacher:

Remember that your class may include few pupils with physical and mental challenges. Some of the children may have high mental ability, while others may be slow learners; some may be dyslexic and not able to read or spell well as the others. All these are special needs children who need particular attention (CRDD, 2012, p. vii).

Again, the Mission Statement of the MoE for basic education dwells on accessibility, equity and quality for all (MoE, 2003). This is further reiterated to the teacher by the CRDD document in more explicit terms. The syllabi preambles state that as teachers:

Ensure that you give equal attention to all pupils in your class to provide each of them equal opportunities for learning. Pupils with disabilities may have hidden talents that can only come to light if you provide them the necessary encouragement and support in class (CRDD, 2012, p. vii).

Moreover, the heterogeneity, individual differences and uniqueness of learners in the Ghanaian basic school classrooms are pointed out to the classroom teacher in the Specific Objectives aspect of these syllabi preambles:

You will note also that specific objectives have been stated in terms of the pupil... This in effect, means that you have to address the learning problems of each individual pupil (CRDD, 2012, p. viii).

And most surprisingly, evaluation exercises are even supposed to be differentiated per the syllabi criteria: Thus, “they should be in the form of oral questions, quizzes, class assignments, essays, structured questions, project work etc” (CRDD, 2012, p. ix).

However on the contrary, the detailed aspects of the TLA and the assessment exercises are rather stated in plural form. This treats learners in bulk. Thus the ‘pupil’ is therefore seen homogeneously as ‘pupils’ and are treated as such, but not as unique different individuals (CRDD, 2012). This implies that teachers can and as a matter of fact do teach to the middle. Studies (Gyasi, 2011; Dotse, 2012; Thomas, 2012; Henne, 2013; Kuyini & Abosi, 2014) affirm that teachers in Ghanaian basic schools employ a one-size-fits-all and teacher centred approaches to instruction and do not effectively cater for their diverse learning needs.

There is a general consensus that good teaching matters and that it may be the single most important school-based factor in improving learner achievement and in giving them good education (Dorleku, 2013). Manning et al. (2010) note the importance of fair over equal; implying that every learner should receive the instruction he/she

needs, not what every other child is receiving. Casely-Hayford, Campbell, Seidu, Quansah, Gyabaah and Adams (2013) suggest that more emphasis should be placed on helping learners to learn, siding with Acheampong's (2014) appeal to reform not only what children learn but how they learn.

Several studies in Ghana (Kuyini & Desai, 2008; Dorleku, 2013; Sakyi, 2014; Carlson, 2014) therefore prompt teachers of the need to change their classroom practices, adopt adaptive instructional practices and differentiate their classroom instructions (Carlson, 2014) to be able to address the growing needs of children in the regular classroom setting.

While the DI concept has been tried, tested, accepted and set to work in several countries due to its effectiveness, it remains a concern whether Ghanaian primary school teachers are knowledgeable of it and practice it accordingly. Finding answers to these questions has compelled the researcher to investigate Ghanaian primary school teachers' knowledge and practices of Differentiated Instruction.

1.3 Purpose of the Study

The purpose of this study was to investigate teachers' knowledge and practices of differentiated instruction in Ghanaian Primary Schools.

1.4 Research Objectives

The objectives of this study are to:

1. Ascertain Kwabre East District primary school teachers' knowledge of Differentiated Instruction.
2. Assess Kwabre East District primary schools teachers' pedagogical practices of Differentiated Instruction.
3. Assess Kwabre East District primary school teachers' assessment practices of Differentiated Instruction

4. Determine how supportive Kwabre East District primary schools' learning environments are towards Differentiated Instruction.

1.5 Research Questions

Based on the research objectives the following research questions were formulated to guide the study:

1. How knowledgeable are Kwabre East District primary school teachers of Differentiated Instruction?
2. What are Kwabre East District primary school teachers' pedagogical practices of Differentiated Instruction?
3. What are Kwabre East District primary school teachers' assessment practices of Differentiated Instruction?
4. How supportive are Kwabre East District primary schools' learning environments towards Differentiated Instruction?

1.6 Significance of the Study

Answers to the research questions would seek to contribute to effective practices that take care of all the diverse learners in the Kwabre East District primary school classrooms. The findings would inform stakeholders in Kwabre East District about the real situation of DI in the schools. These findings would be vital when it comes to organising teacher development programmes and in-service training in the district. Findings from the study could be considered when making educational policies such as Special and Inclusive Education programmes in the district. In relation to this, certain measures from the study could be considered when training Kwabre East primary school teachers on inclusive education. The findings would moreover prompt stakeholders in the district about the conditions of their primary schools' learning

environment so that they can improve upon them. It is also expected that the study would encourage other educational researchers to conduct a similar studies in other areas with similar concerns. Finally, the study would contribute to knowledge.

1.7 Limitations of the Study

Although the research has achieved its aim, there were some unavoidable limitations. First, due to time limit and scarcity of resources the study was conducted in Kwabre East District only. Therefore, the findings could not be generalised. Also, not many studies on DI have been done in Ghana; so the literature reviewed was mostly from foreign studies. The collection and organization of the data for analysis and discussions were the most demanding part of the research design. It was particularly difficult to sieve all useful responses from the interviews and observations into categories for analysis. The categories identified in this study were therefore shaped by the researcher's perception and interpretation with guidance from his supervisor.

1.8 Delimitations of the Study

The study was limited to Kwabre East District. The study focused on teachers' practices of inclusive teaching in the Ghanaian primary school context *pari passu* differentiation. There are so many aspects of DI such as planning, content, materials and products among others. However the researcher limited himself to pedagogical, assessment and environmental aspects of DI due to time and resource constraints.

1.9 Organization of the Study

The rest of the study is organised into five chapters (2 to 6). Chapter two deals with literature review and it involves theoretical and empirical evidence of the problem under study. Chapter three deals with the methodology employed, it examines research design, population and sampling, research instruments, data collection

procedures and data analysis. Chapter four analyses and reports research findings. The fifth chapter discusses the findings while the final chapter six presents a summary of the findings, conclusion and recommendations.

CHAPTER TWO

LITERATURE REVIEW

2.0 Overview

This chapter discusses the efforts made by nations in search of quality education for all. It also looks at the concept of differentiated instruction; the philosophical basis and theoretical frameworks upon which DI is built. Related literature would be reviewed in this chapter. A conceptual framework drawn from the literature is presented. The chapter concludes with a summary of the literature review.

2.1 Quality Education For All

The crucial importance of education to the individual (Imran, 2008; Rose & Dyer, 2008; Anamuah-Mensah & Ankomah, 2010; Lochner, 2011) and its critical relevance to national as well as global development (Bloom & Cohen, 2002; Hanushek & Woessmann, 2008; Alaba, 2010; Mazise, 2011) have necessitated agitations for more functional and quality education the world over. The concerns for quality education root from the EFA policy that was inauguration in Jomtien (Thailand) in 1995 and in Dakar (Senegal) in 2000 (Alaba, 2010). Steer and Wathne cited in Alaba (2010) state that, the initiative to embark on the universal education emerged when education was declared a human right in 1948. In this regard, the World Nations through Millennium Development Goals (MDGs) came up with a target that all member states should give quality education to all citizens (Alaba, 2010). Moreover, the inclusion of quality

universal education in the MDGs is an indication of the world nations' concern for giving quality education to all (Steer & Wathne cited in Alaba, 2010). Policymakers in developing countries have generally accepted the message of the relevance of education and have greatly increased their efforts on education (Glewwe, Hanushek, Humpage & Ravina, 2011). However, the most consistent focus of their investment over the past three decades has been on increasing primary school enrolment rates, with the ultimate goal of improving levels of educational attainment (Glewwe et al., 2011). For instance, from 1980 to 2008 primary school enrolment rates as well as government expenditures on education increased in all regions of the developing world, such that by 2008 gross primary enrolment rates were at or above 100% in Latin America and Sub-Saharan Africa including Ghana (Glewwe et al., 2011).

2.2 Ghana's Efforts towards Providing Quality Education for All

The government of Ghana has been leading Africa on several fronts to attain the MDGs in relation to education especially improving universal access and gender equity (Casely-Hayford, 2000). Every Ghanaian political leadership over the years has continually placed education as its highest priority since it has been a key pillar to their social and political lives (Casely-Hayford, 2011). Consequently, the Government of Ghana also subscribes to the principles of EFA and is committed to its attainment, particularly the achievement of Universal Primary Completion by 2015 (MoE, 2003). The ESP) 2003 - 2015 aims to prioritise investment in education in order to achieve international goals and national policies (MoE, 2003). Akin to the global status, education is a right in Ghana as a constitutional provision and mandate. Chapter 6 Section 38 Sub-Section 2 of the constitution for the Republic of Ghana advocates a Free Compulsory Universal Basic Education (FCUBE) for every school-age child to be realized through the introduction of an FCUBE programme (The Constitution of

the Republic of Ghana cited in Casely-Hayford, 2011). The main policy goal of the FCUBE programme is to provide opportunity for every school-age child in Ghana to receive free quality basic education (MoE, 2003). With respect to this, the MoE has identified three key objectives for the FCUBE programme which include improving the quality of teaching and learning, improving the management efficiency of the education sector and improving access to and participation in basic education.

In conformity with the MDGs and the EFA goals, the GoG in more recent times introduced a lot of educational interventions and strategies such as My First Day at School, National Literacy Accelerated Programme (NALAP), The School Monitoring and Improvement Plans (SPIPS), Capitation Grant, Ghana School Feeding Programme (GSFP), etc (Casely-Hayford et al., 2011). All these were initiated to increase enrolment, attendance, retention and provide quality and inclusive basic education for all children of school-age in fulfilment of the constitutional mandate and international obligations on children's right to education (Casely-Hayford et al., 2011). These sorts of educational interventions are frameworks of action to cater for all children and meet their diverse academic needs (Casely-Hayford, 2011). The interventions also sought to limit inequality in access to good education, promote efficiency in teaching/learning, improve the quality of instruction and make education more relevant to the demands of modern economy (Casely-Hayford et al., 2011).

Notwithstanding the country's significant interventions and investments in providing quality education for all, researchers consistently prove that the education and learning outcomes among Ghanaian basic school children continue to be among the worst in the world (Casely-Hayford, 2011). For instance, less than 25% of Ghana's

Primary class 6 children are not able to attain basic literacy skills after eight years of public schooling (MoE, 2012; Casely-Hayford, 2011). A study conducted by The National Education Assessment (NEA) cited by Casely-Hayford (2011) also reports that less than 25% of Ghanaian youth reach proficiency levels for primary 6 English and only 10% attain proficiency levels in P6 Mathematics. A coalition of NGOs and other education stakeholders have also expressed fears that Ghana is most likely to miss out on the EFA target and the MDGs goals if urgent steps are not taken in providing quality basic education for all children (UNICEF Ghana, 2013).

Nonetheless, what is at the centre of quality education is whether children are learning basic skills, especially in the areas of literacy, numeracy and skills for life (UNICEF, 2010). More so, the number of children who participate in schooling and the number of years of schooling by themselves are not as important as the quality of education they receive (UNESCO, 2005). The argument is that, if children attend school but are not able to achieve better learning outcomes, especially in literacy, numeracy and essential life skills, then they do not have meaningful access to education. Unfortunately, the quantitative aspect of Ghanaian education rather than the qualitative aspect has become the main focus of attention in recent years for policy makers and governments (UNESCO, 2005).

Per UNICEF Ghana (2013) report, apart from the large number of children staying out of school in Ghana, there are many others in the Ghanaian basic school classrooms, who do not have access to education. This implies that several learners in Ghanaian basic school classrooms do not benefit from a quality education and are not equitably and fairly treated in terms of instructional delivery (UNICEF Ghana, 2013). UNESCO cited by Dorleku (2013) further reveals that, specific groups of children who are in the

classrooms have failed to receive the full benefits of public education and as a result have had difficulty achieving success in school throughout the history of public schooling in Ghana. Hayford (2007) also found that, many students who have diverse needs with regards to learning difficulties are being ignored in the mainstream education in Ghana. Moreover, curriculum inflexibility and examination focus leave little room for addressing the diversity in pupils' learning (MoEYS, 2004). These affirm Acheampong's (2014) opinion that, it makes sense to make basic education free but the challenge is not only free access but free meaningful access.

There is a general consensus that good teaching may be the single most important school-based factor in improving learner achievement or otherwise (Dorleku, 2013). Dorleku reaffirms that children's learning failures are mainly attributed to ineffective instructional approaches, methods, techniques and strategies and that teaching approaches are key determinants of educational change, improvement and effectiveness or otherwise. Several other studies (Anderson, 2009; Palmer & Maag, 2010; Sakyi, 2014; Acheampong 2014) reaffirm that how children are taught is more crucial to the effectiveness or otherwise of their learning outcomes. Also, what teachers think, believe and do in the classroom ultimately determine the kind of learning that their learners receive (UNICEF Ghana, 2013). Several studies (Agbenyega, 2006; Gyimah, 2011; Kuyini, 2013; Kuyini & Abosi, 2014) reported the use of one-size-fits-all approaches and the teacher-centred methods of teaching in Ghanaian schools. Anamuah-Mensah and Ankomah (2010) also found that many teaching approaches used in Ghanaian basic schools are not informed by findings from evidence-based research, and that too many teachers do not have a clear understanding of why, how, what and when to use particular strategies. Owing to this, several studies reported that the diverse learners with diverse learning needs in

Ghanaian basic school classrooms do not benefit from a quality instruction and are not equitably treated in terms of lessons delivery, in that their learning needs are not catered for (Hayford, 2007; Gyimah, 2011; UNICEF Ghana, 2013).

In effect, learners in our modern classrooms are at risk of school failure due to their individual differences and diversities (Anderson, 2009). These classrooms possess different categories of learners including the disadvantaged, gifted/talented and slow learners with a variety of needs and a wide range of experiences who should be taught considering all these factors (Anderson, 2009).

Imran (2008) supports these factors and suggests that teachers should use child friendly language, adapt the school environment to diverse needs of the learners and to foster more participatory child-centred approaches to teaching in the classroom. Erickson (2006) opines that in order to meet the needs of diverse learners, it is necessary for teachers to implement new teaching strategies that do not teach to the middle, but those that address the learning needs of every learner (Franz, 2009). It is therefore necessary that what and how children learn in Ghanaian schools must be reformed (Acheampong, 2014). Thus, more emphasis should be placed on helping learners to learn in Ghanaian school classrooms Casely-Hayford et al. (2013).

2.3 Differentiated Instruction: A Necessity in Ghana Education

All the proposed approaches, practices, strategies and techniques of teaching and learning can be codified into a single basket called Differentiated Instruction (DI). The DI paradigm which is gaining ground in many educational circles the world over calls for a rethinking of the teacher's methodology, management and content, invite learners to be engaged in the process to the benefit of all (Palmer & Maag, 2010).

DI is defined by Launder (2011) as the modification of a blend of the content, process and product in order to meet the readiness, interests, learning style and learning needs of all learners in a particular classroom and a way to ensure that they all have the chance to succeed. According to Gangi (2011), DI is a strategy of teaching that accounts for the differing learning needs of learners by accommodating their differences and abilities through the variation of the methods and materials. DI can also be defined as an instructional approach used by educators to meet the academic and behavioural needs of a wide variety of diverse learners within the same classroom setting (Edwards, Carr, & Siegal, 2006). Pettig (2000) also opines that DI represents a practical approach that challenges teachers to change their classroom practices to improve classroom learning for all learners. Manning et al. (2010), similarly describe DI as when every learner receives the instruction he/she needs but not the instruction every other child is receiving. These definitions of DI emphasize the relevance of fairness and equity over equality in the classroom. These imply that teaching to the middle and expecting every learner to understand signifies the greatest unfairness a teacher exposes his/her learners to. These again reaffirm the need to satisfy the learner's learning needs and the need to help every learner to benefit from learning, rather than teaching to curriculum needs and examination requirements.

In another development, Wormeli (2007) sees DI in a broader state and more assimilative in nature. He defines DI as a philosophy of teaching in which other strategies can be incorporated or integrated. Franz (2009) supports this by affirming that, DI engulfs a wide range of instructional strategies and techniques used by educators to improve every learner's abilities and to provide opportunities for each learner to reach his/her highest potential with a chance to access and succeed. Liu

(2006) and McBride (2004) similarly recognize DI as a compilation of many theories and practices that effect positive change in learners' performance. Tomlinson (2000) however does not consider DI simply as an approach or a strategy, but a total way of thinking about learners, teaching and learning. The totality of DI in this regard refers to the actual process (being approaches, methods, techniques and strategies) of teaching that are employed to cater for the individuality of learners in a classroom. Per these definitions, I think that the most relevant thing is not whether DI is an approach, a method, a technique, a strategy or a philosophy, but its ability and intention to bring out the highest potential in every learner in the classroom and its tendency to offer them the maximum opportunity to succeed.

Equity and social justice in education can only be met if teachers find the way to address the diversity of their learners (Valiande & Koutselini, 2009). Launder (2011) accounts that classroom diversities prove that teachers must employ teaching practices that give every learner the opportunity to learn. Valiande and Koutselini (2009) state that, several researchers and scholars reveal that the only solution to the problem of learners' multiple cultures in modern classrooms lies in the theory and practice of DI. Considering the toil of educational think tankers in search of effective instructional practices that would help to educate diverse learners in Ghanaian basic school classrooms, differentiation of instruction perhaps proves to be the answer.

Several researches (Tomlinson, 2001; Anderson, 2007; Franz 2009; Gangi, 2011) prove that the use of DI provides several benefits to learners as well as teachers in diverse ways. With DI, learners are able to get a better access to the curriculum, increase their understanding in the content taught to them and enjoying its learning to the fullest (Franz, 2009). DI helps teachers to address the learning needs of each

learner by teaching to their readiness levels through their learning styles and interests (Gangi, 2011). Again, DI helps teachers to accommodate learners who have mastered the lesson content and are ready to be challenged when they teach to learners' readiness level. And with the tools of DI, teachers can challenge learners to learn as far as they can go towards further academic achievement and success (Levy, 2008).

Another significant benefit of DI is its motivation-driven nature. Gangi (2011) again reports that DI motivates learners to learn harder when they are given the chance to choose learning activities they are required to complete. This, according to Anderson (2007) would enable learners to be motivated to learn to the brim. Also, "A combination of a differentiated curriculum and the options for student choice are ideal for promoting success for learners with disabilities and it can improve outcomes for other students as well" (Servilio, 2009, p. 10). No matter how slowly a learner learns, when he/she is able to complete a task on his/her own, he becomes intrinsically motivated and would be compelled to do more. When teachers use DI, all learners of different ability levels improve in the comprehension of the taught content, and thereby resulting in a more positive learning experience (Franz, 2009).

More so, learners' choices of learning processes that best reveal their unique individual skills as they participate in D I allow them to take responsibility for their own learning. Painter (2009) confirms that learning become more interesting, fun, and significant when learners are given the opportunity to choose their learning activities through the use of DI. The learner centred nature of DI allows learners to be independent and responsible learners throughout their learning endeavours.

In another development, teachers also benefit from the use DI within the classroom according to Franz (2009). When DI is employed, learners become more independent and teachers are able to create an exciting, active learning environment and at the same time facilitate their learning which reduces the teacher's workload at the long run (Franz, 2009). In this regard, I think that DI permits teachers to teach their learners how to learn. This consequently agrees with the Chinese adage that emphasizes the relevance of "teaching people how to fish rather than fishing for them". When learners are trained in this manner, they would not wait for their teacher's instructions before they learn, they would rather initiate and sustain their own learning since they have been taught to do so on their own. This would guide and help them to learn for and by themselves throughout their learning endeavours.

DI compels educators to provide relevant remediation for learners with special needs and offers appropriate opportunity to challenge gifted learners (Franz, 2009). This enables no child to be left behind (Sondergeld & Shultz, 2008) and prevents having them experience frustration (Franz, 2009). With DI, classrooms become active learning environments, and the roles of learners and the teachers change dramatically. The teacher's role changes to a facilitator of students' learning while the learners become more independent learners (Beecher & Sweeny, 2008). Anderson (2007) states that, the ultimate inspiration to the teacher who differentiates instruction is taking care of all learners by providing a learning environment and opportunities that exclude no child. Several countries that aim to educate every learner in their schools are opting for DI due to its effectiveness (Palmer & Maag, 2010).

2.4 Philosophical Basis for Using Differentiated Instruction

The most widely quoted philosophical ground to justify the adoption and practice of DI is the theory of constructivism. Durrett (2010) asserts that, the philosophical basis as well as the theoretical framework for differentiated instruction comes from a compilation of constructivists' theories and studies. Tomlinson and Allan (2000) also posit that constructivists such as Dewey, Piaget, and Bruner, were precursors of the DI model which projects an active, learner-centred, meaning-making approach to teaching and learning. Durrett (2010) further explains that DI evolved from the work of Dewey; a constructivist who advocated for teacher instruction to be aligned with the needs of learners. An important aspect of the DI's constructivism also comes from the work of Piaget whose "theory of cognitive development and genetic epistemology studies purported that knowledge comes neither from the subject or the object, but from the unity of the two" (Brooks & Brooks cited in Durrett, 2010, p. 34).

Constructivism, a recent development in cognitive psychology alerts on the central role learners play in constructing new knowledge (Kauchak & Eggen, 2003). Constructivism is an eclectic view of learning that emphasizes four key components in the view that "learners construct their own understanding rather than having it delivered or transmitted to them, new learning depends on prior understanding and knowledge, learning is enhanced by social interaction and authentic learning task promote meaningful learning" (Kauchak & Eggen, 2003 p. 3). This has fundamentally changed how teaching and learning is perceived; learners have become extremely active meaning makers who build upon current knowledge. Teachers who are now facilitators in this kind of teaching and learning process have to generate meaningful

learning situations in which learners can work with others on considerable learning tasks in order to facilitate the said process (Kauchak & Eggen, 2003).

Basically, the concept of constructivism proposes that knowledge must be constructed within the learner according to Piaget (cited in Durrett, 2010). This implies that the construction of knowledge is a dynamic process that requires the learner to be actively engaged. Vygotsky also emphasises on the role of “social interaction, language, and discourse in the development of understanding” to allow learners to scaffold each other’s learning and “co-construct” (Durrett, 2010, p. 34). “Despite these differences between Piaget’s cognitive constructivism and Vygotsky’s social constructivism both project peer interaction, which is typically a motivating context for learners” (Blatchford et al. cited in Durrett, 2010, p. 34). According to Durrett (2010) several studies prove that learners are more successful when taught in ways that are responsive to their readiness levels (Vygotsky, 1998), interests (Maslow cited in Durrett, 2010), learning profiles (Sternberg et al., cited in Durrett, 2010), and motivational catalysts (Deci & Ryan cited in Durrett, 2010). In the hindsight, constructivism is a philosophy and a theory of teaching and learning that draws on a wide range of teaching strategies and practices such as inquiry-based learning, cooperative learning, project-based learning and all other child-centred approaches. DI is associated with constructivism because it incorporates all these methods, theories and paradigms.

Differentiated teaching is the learning process in which learners maximise motivation when they are supported to construct their knowledge for cognitive growth that will eventually improve all learners’ academic outcomes and as such strengthen their explanatory ability (Valiande & Koutselini, 2009). Per the assertions of Valiande &

Koutselini (2009) differentiation of teaching must actually not be seen as a teaching process but more as a learning process where emphasis is laid on the interaction of learners, knowledge and teacher in a flexibly open learning process. They further weigh in that differentiation of teaching in the frame of constructivism provides the answer to the problem of increasing learners' diversity and school failure in a mixed ability classrooms. Construction of knowledge is a unique personal learning process that enhances every individual learner to understand and acquire new knowledge based on the learner's prior knowledge as well as his/her personal beliefs and learning needs. Learner centred instructional approaches in a constructivist learning process where DI is applied take every learner as a unique personality and not as children with similar characteristics (Valiande & Koutselini, 2009). Throughout differentiated teaching amidst constructivism, opportunities are given to learners to put theory into practice based on their prior knowledge which aids them to investigate the connection of knowledge gained with those from other subject areas (Koutselini, 2006). The paradigm of social constructivism asserts that the environment in which the learning takes place is just as important and significant as the learning itself, and that when learners are in a classroom that is not differentiated, they may become unruly and as such lose moments that can contribute to a meaningful education (Greene, 2011).

Summarily, the basic implications of constructivism in a DI classroom may include the significant use of interactive investigative activities, an appealing and a challenging learning environment which provides learners with a high degree of active cognitive involvement and the use of cooperative learning strategies. It also involves the use of activities that motivate and challenge learners to learn more, the use of appropriate corrective assessment practices among other things that suit a

learner's prior knowledge, interests, background, abilities, learning styles and level of intelligence. In another development the pedagogical implications that underlie DI and constructivism propose that active learners construct their own knowledge. This should be facilitated by teachers with stimulating and motivational environment and experiences that will challenge learners' existing conceptions and actively involve them in teaching/learning process (Matthews, 2002). With respect to this, the primary role of the classroom teacher according to Crawford (2000) is to be a facilitator, a monitor, a diagnostician, a guide, an innovator, an experimenter, a researcher, a modeller, a mentor, a collaborator, a motivator and a co-learner. In all, constructivist perspectives on instruction serve as a basis of understanding teaching and learning and have widely been accepted by a majority of educators worldwide.

2.5 Theoretical Bases of Differentiated Instruction

Several popular educational theories provide basis for using DI. However, the major ones that support it most are Gardner's theory of Multiple Intelligences (MI) and Vygotsky's Zone of Proximal Development [ZPD] (Lounder, 2011).

2.5.1 The Theory of Multiple Intelligences

Howard Gardner first introduced his Multiple Intelligences (MI) theory in 1983 through his book *Frames of Mind*. Gardner believes that "human cognitive competence is better described in terms of a set of abilities, talents, or mental skills" which he calls "intelligences" (Gardner, 2006, p. 6). According to the MI theory, intelligence is viewed as a "pluralistic view of the mind" which buys from the idea that the mind of a learner consists of several intelligences (Gardner, 2006, p. 5). These MIs or pluralistic view of the mind account for the different ways learners think, learn or act and each of them is connected to a specific part of the brain (Gardner, 2003).

The MI theory projects that every learner is intelligent in one way or the other. It also affirms that every learner has various levels of strengths or weaknesses in an area of intelligence. Gardner again explains intelligence as a person's ability to process and use information to create a product or solve a problem. He projected the existence of seven distinct intelligences when he first introduced the MI theory. These include spatial, linguistic, logical-mathematical, bodily-kinesthetic, musical, intrapersonal, and interpersonal intelligence. He later added an eighth and ninth intelligences which are the naturalistic and existential intelligences respectively (Gardner, 2009). Gardner (2006) suggests that each person possesses and uses all nine intelligences, and they all work together in an ordinary person though one intelligence may be stronger than the other. However, genetic and cultural backgrounds of individuals influence how they use and develop their intelligence preferences. Gangi (2011) asserts that teaching to students' strengths using MI has several benefits such as; meeting learners' learning needs as well as engaging them which can finally lead to higher learner attainments. Gardner (2003; 2005; 2006; 2009) explains the various intelligences of his MI theory:

2.5.1.1 Linguistic Intelligence

The linguistic intelligence is the ability of a learner to understand spoken and written language. Linguistic intelligence learners value books and demonstrate their strengths through activities like using words, reading, storytelling, brainstorming, tape recording, journal writing, speech giving, debates and publishing

2.5.1.2 Logical-mathematical Intelligence

The logical-mathematical intelligence entails the ability to understand logic and numeric operations. Learners with this intelligence strength enjoy learning activities such as calculations quantifications and classifications using logical reasoning

2.5.1.3 Spatial Intelligence

The spatial intelligence is the capacity to visualize what is spoken, read or written and the ability to manipulate those visualizations. Learners with spatial intelligence strength learn best by using a mental and/or physical picture that best aids them to understand new information. Activities such as drawing, using maps, and solving puzzles help these learners to demonstrate their strengths.

2.5.1.4 Bodily-Kinesthetic Intelligence

The bodily-kinesthetic intelligence is the capacity to learn through movement and to solve problems with the whole or parts of the body. Students with this intelligence have excellent hand-eye coordination. Activities in which these learners do well include role-plays, building, playing games, sports and other hands-on activities.

2.5.1.5 Musical Intelligence

The musical intelligence is the capacity to create, perform, and appreciate music. Learners with this intelligence strength understand musical concepts and learn well through songs, rhythms, chants and poetry.

2.5.1.6 Interpersonal Intelligence

The interpersonal intelligence learners are known to be 'people smart' and it involves understanding people. They have a strong sense of community and work well with others through peer sharing, cooperative groups, board games, and simulations.

2.5.1.7 Intrapersonal Intelligence

The intrapersonal intelligence learners have the ability to understand themselves. Learners with this intelligence strength have a strong sense of self and prefer working alone. They are in touch with their own feelings and are good at reflection by working alone, setting goals, meditating, and choosing which activity to complete.

2.5.1.8 Naturalistic Intelligence

The naturalistic intelligence is the capacity to differentiate and sort out objects or phenomena in nature. Students with this intelligence strength enjoy being outdoors, exploring, and learning about plants and any other natural events.

2.5.1.9 Existential Intelligence

The existential intelligence is the capacity to think about the big picture and why things or people exist. Students with this intelligence strength ponder over why and how things happen. They analyze and think about questions with no clear answers, ponder how variables interact and evaluate how concepts relate to one another.

Gardner notes that employing MI in instruction requires developing several educational strategies based on how an individual thinks to ensure that every particular learner is offered the utmost opportunity to learn, grow and succeed.

2.5.2 The Theory of Zone of Proximal Development

The theory Zone of Proximal Development (ZPD) was propounded by the Soviet psychologist Lev Vygotsky. Vygotsky defines ZPD as the “gap between learners' current actual development level determined by independent problem-solving and the learners' emerging or potential level of development” (Beheshti, Bowler, Large & Nessel, 2000, p. 13). It is the difference between what a learner can do after receiving help and what he can do without any help (Rezaee & Azizi, 2012).

The ZPD according to Schutz (2004) is the gap between what a learner has already mastered; being his/her actual level of development, and what he/she can attain when supported; being his/her potential development. The fundamental aim of the ZPD theory is to point out the gap between the learner's ability to solve problems on his

own and the significant relevance in his/her ability to solve them when given the necessary assistance. Basically, all the tasks that a child can perform alone can be referred to as developmental level. ZPD emphasizes that “what the child is able to do in collaboration today; he/she will be able to do independently tomorrow” (Vygotsky cited in Kozulin, Gindis, Ageyev, & Miller, 2003, p. 40). Relevant concepts which are of great importance to the theory of ZPD are assessment, scaffolding curriculum, the process of learning, flexible grouping and learner choice (Miller, 2002). Assessment plays a very relevant role in establishing readiness and scaffolding material in the ZPD theory (Whipple, 2012). Teachers’ knowledge of ZPD helps them to assess their learners and provide instructions which are content-rich at each learner’s level.

2.5.2.1 Collaboration in ZPD Assessment

During instruction, the ZPD of learners is assessed via interaction or collaboration with them as it provides an opportunity for imitation, which is “the way for identifying maturing psychological functions that are still inadequate for independent performance” (Shabani, Khatib & Ebadi, 2010, p. 239). According to Vygotsky (1998), applying the principle of cooperation in the learners’ ZPD helps the teacher to ascertain their mental maturation which is critical to their development.

2.5.2.2 Scaffolding in ZPD

In further development, the main concept underpinning Vygotsky’s ZPD theory is ‘scaffolding’. Studies (Daniels, 2001; Shabani et al., 2010) project that socio-cultural theory of mind and the concept of ZPD form the basis of scaffolding. Scaffolding curriculum; which is the support a learner needs to make progress is also a crucial aspect of Vygotsky’s theory of ZPD (Whipple, 2012). It is a process in which learners deal with learning tasks with the help of teacher, a parent, caretaker, language

instructor, another peer or any other person who has already mastered that particular function (Rezaee & Azizi, 2012). Any person who possesses the capability of scaffolding a learner can be termed as a 'Significant Other' or a More Knowledgeable Other'. Rezaee and Azizi (2012), assert that the significant others' help in the scaffolding process is very critical and relevant for a child's development within the ZPD. Vygotsky believes that as long as a more knowledgeable person is collaborating with a child, that child could continue to grow significantly in their learning (Whipple, 2012). In my own view, scaffolding is more like supporting a concrete with wooden boards (as in building) and leaving it to dry into one solid mass that can stand strongly on its own before the wooden boards are completely removed. In this sense, scaffolding entails a more knowledgeable other giving a gradual support to a learner and redrawing gradually and totally at last as the learner becomes capable of dealing with the task at hand. In scaffolding, the learning environment and tasks should be aptly challenging and levels of teacher intervention should be adjusted in response to learner needs (Whipple, 2012). To Whipple, the ideas of the teacher being flexible, providing choice and allowing for creativity are important aspects of ZPD. All these are the very basis upon which DI is also built.

2.5.3 Differentiated Instruction in MI and ZPD

The MI and ZPD theories have several similar ideologies and assertions which are tantamount to the principles and practices of differentiation. First of all, individual learner variance, diversity, difference and uniqueness that are the very basis upon which the DI concept is built are also projected by both the MI and the ZPD theories. Both theories propound that individual learners in the same classroom are absolutely different and as such should not be expected to learn in the same way. For instance, Gardner believes that "human cognitive competence is better described in terms of a

set of abilities, talents, or mental skills” which he calls “intelligences” (2006, p. 6). In the same vein, Vygotsky (1998) recognizes this individuality of learners and asserts that each individual learner might have his/her own instructional levels, readiness levels for learning as well as developmental levels. All these are supported by Tomlinson’s (2001) view that DI presents an effective means to address learner variance, differences, diversity and uniqueness. Several DI studies (Marzano, 1992; Tomlinson, 2000; Marzano, Pickering, & Pollock, 2001) even reveal that educational approaches that ignore learner diversities, differences and variance of learners are likely to be counterproductive to learners in reaching their full potentials.

In another development, the theories of MI and ZPD frown on the use of ‘teach to the middle’ approaches to instruction and advocate for giving appropriate individualised support to learners per their leaning needs. That is, as the ZPD suggests flexibility, variation, creativity and consideration of learner choices in instruction (Whipple, 2012), the MI theory suggests using ‘multiple entry points’ in presenting each topic or concept during teaching and learning (Gardner, 2006). With this, any topic or concept can be taught in at least seven distinct ways correlating with the intelligences (Gardner, 2006). To Gardner, when a teacher approaches a lesson in several different ways, learners will be more exposed to the lesson which will foster many positive impacts on their learning. Similarly, Vygotsky claims that scaffolding being a major teaching and learning strategy of the ZPD theory should be employed differently or variably depending on the learning needs of the learners (Whipple, 2012). Invariably, what Gardner terms as “multiple representation” which learners acquire through the process of “multiple entry points” is equivalent to the processes Vygotsky claims

awakens a variety of “internal development”. In effect, these ideological claims are termed as multiple routes to different learning in DI. Moreover, it is based on these theoretical underpinnings that DI presents an effective means to address learner variance (Tomlinson, 2001), avoids the pitfalls of the one-size-fits-all curriculum and practices of teaching (McBride, 2004), incorporates current research (Tomlinson, 2003), while varying learning styles (Lawrence-Brown, 2004).

As a dynamic instructional tool, DI requires the modification of the content, process, product and environment of instruction for learners based on their unique, diverse and differing characteristics (Tomlinson, 1995). This includes providing learners with varying levels of support (Tomlinson & Allan, 2000). The theories of MI and ZPD go side by side with the concept of modifying content, product and process, which is advocated by DI (Renzulli & Renzulli, 2010). Relevant concepts, per the assertions of Miller (2002) which are the actual foundations for the theory of ZPD are variation of assessment, scaffolding of curriculum or content, the process of learning (comprising approaches, methods, techniques and strategies) flexible grouping and learner choice. In similar development, the suggested effects that can be employed when using Gardner's multiple entries, multiple representations, and multiple connections (which are the fundamental concepts of MI) include asking the right question, the effects on curriculum, instruction, assessment and the school environment (Williams, 2002).

Another important idea that DI puts across is that learners should be taught through different instructional process due to individual differences. Although DI seeks to employ a variety of instructional strategies to teaching; these strategies can be classified under independent and interactive learning. The interactive learning practices which can involve a learner and his/her colleagues, a teacher or learning

material are the basis upon which several DI practices are built. According to Chaiklin (2003) Vygotsky's first interest was to develop a theoretical basis for appropriate pedagogical interventions, principles for possible instructional grouping of learners and identification of specific interventions for individual learners. Although Vygotsky projects these instruction interventions on diagnostic procedures by considering the learner's current state of development (Shabani et al., 2010), the emphasis is on social interactions and cooperation of the learner (Miller, 2002). MI researches moreover advocate teaching to learners' strengths using intrapersonal (individualised) as well cooperative (interactive) approaches to instruction (Gardner, 2009). All these point to the direction that, the DI concepts of individualised and interactive learning are rooted in the theories of MI and ZPD. Several DI researches (Callahan, 2001; Heacox, 2002; Powers, 2008; Renzulli & Renzulli, 2010) project the use of the independent learning and the need for challenging materials and cooperative practices.

Differentiation of instruction with the modification of its assessment, products or the outcome is grounded in Vygotsky's theory of ZPD as well as Gardner's MI theory. One of the relevant concepts to the theory of ZPD is assessment (Miller, 2002). Whipple (2012) cites Vygotsky's position that, assessment plays a major role in establishing readiness and scaffolding in the theory of ZPD. According to Vygotsky's theory, teachers are able to provide instructions which are appropriate to their learners' development when they have knowledge of ZPD and assess learners' readiness level (Miller, 2002). According to Gangi (2011) learners' intelligence strengths must be assessed and determined in the MI theory through several ways which include; several inventories, questionnaires, tests and observation. Williams (2002) argues that, the position of Gardner's MI theory on assessment can be justified that when a lesson is taught using more than one approach to teaching, it should also

be accordingly assessed using more than one method. Variations in DI assessment which intends to measure what each learner produces as evidence of their learning (Gangi, 2011) shows the learners' ability to apply what they have learned through the process (Tomlinson & Allan, 2000; Heacox, 2002; Levy, 2008). The products are usually how teachers establish whether learners have learned and understood the content or not (Wormeli, 2007). Assessments choices should be given to learners formatively and summatively to show that learning has occurred (Heacox, 2002).

Building upon the theories of ZPD and MI, differentiation of instruction advocates for learning environments that provide optimum conditions for children's learning. This involves several elements in the classroom environment such as rules, procedures, furniture, resources, materials and atmosphere (Tomlinson, 2000). For instance, Williams (2002) asserts that, one of the major aspects of using MI is on the school environment. Thus, the MI theory requires the teacher to provide a variety of inviting atmospheres that correspond to the various multiple intelligences for successful application. Meanwhile, inviting learning environment such as quality of teacher-learner interaction is perceived to be very crucial when scaffolding learners in the Vygotsky's ZPD theory (Shabani et al., 2010). Again, the teacher being flexible, providing choice and allowing for creativity are other relevant means of creating an appealing learning environment in Vygotsky's ZPD (Whipple, 2012). In differentiation, learning environment comprises the physical space as well as the way it is arranged (Wormeli, 2007). According to (Gangi, 2011), differentiating the classroom environment should provide learners with an inviting atmosphere to learn.

DI with its concept of readiness is grounded in Vygotsky's ZPD learning theory (Hall, 2002). Thus, the concept that the difficulty of content should be beyond the range of learners' current level of mastery in order to challenge them (Durrett, 2010).

2.6 Areas of Differentiated Instruction

According to Tomlinson (2000), DI comprises teachers' efforts to respond to the variance among learners in the classroom through variation of instruction to accommodate the diversities and the differences in learners' learning needs. Tomlinson (2001) argues that anytime teachers modify the way a lesson is presented or moderates an assignment for a particular learner, they are differentiating instruction. Even, using different methods, strategies, materials and different examples to re-teach the same lesson is a way to differentiate instruction (Tomlinson, 2001). Simply put, any attempt made by a teacher to adapt instruction or materials to address the learning needs of learners entails a differentiation of instruction. In order to do that, a teacher must address three student characteristics, which Tomlinson identifies as: readiness, interest and learning profiles (Gangi, 2011). Gangi further expatiates that learner readiness is how much background knowledge a learner possesses in relation to a topic, which is commonly referred to in Ghanaian education setting as the learner's Relevant Previous Knowledge (RPK), learner interests are the topics that the learner is ready to learn which will motivate them to be engaged in learning while learning profiles of the learner involves how the learner learns.

In another instance, there are four main areas projected by researchers and educators (Tomlinson, 2000; Heacox, 2002; Wormeli, 2007; Levy, 2008; Launder 2011) through which instruction can be differentiated. These include content, process, product and learning environment. Each of these areas of DI should be indicative of each learner's level of readiness, interest and learning profile (Levy, 2008). According

to Cox (2008), the goal of differentiating in these areas is to allow each and every learner to reach his/her own potential by giving them exactly what they need to grow academically. Though learners in the same classroom have different skills, abilities and talents, the goal of DI is to offer all learners the chance to attain a similar level of mastery on a particular content (VanSciver, 2005).

2.6.1 Differentiating through Content

Gangi (2011) simply sees content as what students need to learn. Traditionally, content refers to the very aspect of the curriculum as well as the core-points of the syllabi that are taught to the learners. To several other researchers (Tomlinson & Allan, 2000; Heacox, 2002; Wormeli 2007), content refers to what the learners are learning which are defined through objectives. According to Tomlinson (2001), learner characteristics are the basis of content for the teacher to differentiate instruction. Other ways to modify content is based on learners' readiness level, interest and learning profiles (Gangi, 2011). Beside these, a teacher can use a variety of materials and texts to differentiate content in the classroom (Tomlinson, 2001).

2.6.2 Differentiating through Process

Another area through which DI that can be modified is the process. Thus, how learners come to understand and assimilate facts, concepts, skills or better still content (Anderson, 2007). Differentiating through process refers to the procedure through which learners learn and understand the content (Wormeli, 2007; Levy, 2008). DI Process involves how learners understand the content as well as the skills related to those concepts, how they use what was taught and how they apply their understanding of it to a task (Tomlinson & Allan, 2000). To me, it entails the various approaches, methods, strategies, techniques and all other pedagogical means through which a

teacher can use to help the learner to learn, which Tomlinson and Allan (2000) refer to as the 'activity'. In the same vein, teachers can adapt the process according to students' characteristics of readiness, interest and learning profiles (Gangi, 2011).

Wormeli (2007) iterates the easiness in differentiating process as compared to content but downplays the relevance of the teaching/learning strategies that are employed to achieve them. In as much as I agree with Wormeli on the one hand that the process is much easier to differentiate than the content since it requires fewer ways for the learners to learn the material than the material the learners are required to learn. On the other hand, I disagree with his assertion that the strategies of teaching and learning that are used are not important, as long as students are learning. Kauchak and Eggen (2003) state that, good and effective teaching strategies are more crucial to learning. Besides, several other researchers and educationists (Imran, 2008; Viliande & Koutselini, 2009; Palmer & Maag, 2010; Sakyi, 2014) reiterate the need for effective strategies of instruction and the critical role good pedagogical practices play in order to help learners learn effectively. Simply put, making use of DI process implies giving learners several effective ways and means to understand content (Anderson, 2007).

2.6.3 Differentiating through Products

Products or the outcome can be modified as a way to differentiate instruction. It intends to measure what each learner produces as evidence of his/her learning (Gangi, 2011). The product shows the learners' ability to apply what they have learnt through the process (Tomlinson & Allan, 2000; Heacox, 2002; Levy, 2008). The products are usually how teachers establish whether learners have learnt and understood the content or not (Wormeli, 2007). According to Launder (2011) learners demonstrate that they have learned the content by applying what they have learned in creating a

product; which could be in a form of assignment, project or an assessment. Just like content and process, product can also be differentiated based on learners readiness levels, interests and learning profiles (Levy, 2008). Gangi (2011) explains that based on learners' readiness levels, teachers can differentiate products to enable learners apply their knowledge in a certain way such as varying the degree of difficulty of products or the amount of teacher involvement. Again, choices should be given to learners in formative and summative assessments to prove that learning has occurred (Heacox, 2002). Although teachers may ask learners to work in an area that is not their strength (Heacox, 2002), they should note that assessments can take many forms and differ from learner to learner (Lauder, 2011).

2.6.4 Differentiating through Affect and Learning Environment

Another area in which DI can be adapted is learning environment (Lauder, 2011). Many elements involved in the classroom environment which include rules, procedures, furniture, available materials and mood can be modified (Tomlinson, 2000). Gangi (2011) posits that a differentiated classroom should be motivating and stimulating to learners by reflecting current content or skill through student displays and artefacts. According to Wormeli (2007), learning environment refers to the physical space vis-a-vis the way it is arranged. Wormeli further defines affect as the social and emotional factors that influence learning. To differentiate for this area, Wormeli suggests that, teachers should adjust to accommodate a learner's or a group of learners' learning needs by treating them in a way that would make them feel safe, comfortable and willing to take risks in their learning.

2.7 Differentiated Assessment

Assessment is one of the major components of DI in the classroom (Whipple, 2012). According to Tomlinson and Mbeau, (2010), there are several aspects of assessment that are relevant when differentiating instruction. These include pre-assessing before instruction, pre-assessing learners' readiness to adjust lessons, assessing formatively or summatively and assessing learning styles (Tomlinson & Mbeau, 2010). When teachers assess learners throughout a lesson, it helps them to determine their abilities to learn the content and to determine the next step. This kind of assessment for learning helps teachers to ascertain the progress in learners' understanding during instruction, in order for them to adapt their pedagogical practices.

2.8 Teachers' Knowledge of Differentiated Instruction

According to Spurgeon cited by Tsadidey (2002) "Nothing comes out of a sack except what is in it" (p. 3). The fundamental conception that Spurgeon's assertion proves is that, a teacher who does not have the knowledge of something cannot consequently give it out to his/her learners. This implies that, a teacher whose own knowledge of DI is minimal or lacking might be of no or low position to employ it in his/her classroom. Teachers who are in the best position to differentiate instruction in their classrooms "operate from strong (and growing) knowledge bases that are rooted in a philosophy of what classrooms could be like if they maximized the capacity of each learner" (Tomlinson & Mbeau, 2010, p. 10). They further state that differentiation is not a set of strategies for such teachers "but rather a demographically necessary, ethically focused, pedagogically informed and empirically tested way of thinking about their work" (p. 10). Specifically, when teachers possess the right knowledge and of the effectiveness of DI they will be far more likely to integrate it into their classroom instructions (Franz, 2009). However, Tomlinson, (2005) cautions that differentiation

is not a recipe to be applied. It rather requires deep knowledge of its process, theories and ways through which the theory is translated into action (Franz, 2009).

According to Page cited in Franz (2009), lack of knowledge and inadequate expertise in the use DI usually deters teachers from attempting its use as a teaching strategy. Although many teachers see DI to be beneficial to learners, yet they often believe that its execution in their classrooms is unfeasible (Tomlinson, 2005). Moreover, apart from the fact that teachers do not usually receive sufficient training on DI (Tomlinson et al., 2003), those who have been trained adequately on it are discouraged to use it (Franz, 2009). This is because many teachers believe that implementing a new manner of instruction such as DI requires a great deal of effort to put into practice (Holloway, 2000). It is important to note that, the extent to which teachers understand DI is consequential to its implementation and practice by them (Whipple, 2012). This is because DI (though well-known philosophy) is a complex concept to understand and implement; its implementation can be inconsistent (Whipple, 2012). The gap between teachers' knowledge/understanding and practices of DI needs to be bridged if it would impact learners' attainments in a meaningful way (Whipple, 2012).

2.9 Review of Related Literature

Despite the benefits for employing DI, several studies (VanSciver, 2005; McTighe & Brown, 2005; Servilio, 2009; Franz, 2009; Schmoker, 2010) reveal that it has its own drawbacks and challenges. According to VanSciver (2005), the drawbacks to employing DI mainly impacts the teacher rather than learners. VanSciver categorizes these drawbacks as time, resources and complexity. Several other researchers (George, 2005; Servilio, 2009; Gangi, 2011) affirm that DI is time consuming. These researchers consider the toils a teacher has to go through to be able to determine

learners' background, learning style, interests and learning needs vis a vis developing strategies to satisfy them. Gangi (2011) confirms that teachers must make time out of the already packed school period to assess learners' learning needs, look through the assessments, determine their learning styles, diagnose appropriate strategies, plan lessons, and implement them to accommodate those learning needs accordingly. With respect to this, teachers must be willing to invest extra planning time and preparation to create different types of work to get learners to participate in the learning and the content to best their ability so as to satisfy their learning needs (Latz, Neumeister, Adams, & Pierce, 2009). Gangi (2011) also affirms that a lot of resources are required to effectively implement DI. Gangi reaffirms that a major barrier that teachers often face when implementing DI is scarcity of necessary materials. Also, the complexity of employing DI lies in the fact that the teacher has to provide for the whole class as well as specific groups or individual learners (Gangi, 2011).

Tomlinson (2000) discloses that a common barrier to DI is the heavily standardized curriculum which puts teachers under tremendous pressure to teach to the curriculum, at the expense of learners' needs. Researchers (Volante, 2004; McTighe & Brown, 2005;) reveal the intricacies teachers go through to effectively plan and cater for the diverse learning needs of their plentiful learners *pari passu* satisfying the requirements of preparing these learners for all sort of examinations. As a result, teachers refuse to focus on DI or any other teaching method that does not teach learners to satisfy the various tests (Latz et al., 2009). Also, many teachers feel that there is no time to cover anything in classes except what the curriculum requires (Tomlinson & Doubet, 2005).

According to Franz (2009), lack of appropriate training and teacher support is another challenge that many educators encounter in an attempt to implement DI. Franz further

explains that few teachers receive appropriate training and education on DI that would lead to its consistent practice. Tomlinson et al (2003) assert that, pre-service teachers hardly receive sufficient training on using DI and there is not sufficient emphasis on how to teach learners with exceptionalities. Also, seeking for a paradigm shift and a major change in teaching practices by asking teachers to shift from a one-size-fits-all classroom to a complex classroom practice like DI is frightening to many teachers (Tomlinson, 1995). This is because many of them believe that implementing a new manner of instruction requires a great deal of effort to its practice (Holloway, 2000).

Kuyini and Desai (2008) investigated DI for learners' with disabilities in the regular classrooms and found that teachers poorly differentiated instruction and employed no DI at all in some cases. Agbenyega and Deku (2011) also investigated current Ghanaian teachers' pedagogical practices in public school classrooms and concluded that the current instructional practices in the regular classrooms in Ghana are mechanistic, prescriptive, not flexible and do not consider variety of learners' learning styles. Kuyini and Abosi (2014) examined teachers' competence in differentiating (adapting) instructions to cater for the learning needs of learners with learning difficulties in Ghanaian school classrooms and established that teachers have limited to moderate competence in differentiating instruction. The study revealed that class size, teachers' background variables and teaching experience differed significantly and have no significant difference on teachers' competence in differentiating instruction. However, large class size was found to have negative influence on teachers' ability to differentiate instruction. The large class size deterred teachers from differentiating instruction, effectively controlling their class, gaining and

sustaining pupils' interests and attention, effectively monitoring and assessment of pupils' progress during instruction among others.

Another study conducted by Kuyini and Abosi's (2011) on inclusion of street children in the basic school classrooms in Accra revealed that most street children dropped out of school because instructions were not differentiated to their learning needs. The street children reported that they were caned as they did not understand lessons. This practice culminated in some children not thriving in school, thereby pushing them out. They further disclosed that differentiated teaching strategies augment learning outcomes of street children and should be adopted for other group of children.

Anderson (2009) reviewed several literatures on DI and concluded that it is one of the major ways to ensure that every student is learning and reaching their academic potentials. The literature affirmed Anderson's believe that it is a teacher's responsibility to ensure that every learner in a particular classroom is learning and reaching their academic potential. In consistence with the findings of Abbati (2012) in which teachers were frustrated by large class size and the confusing ways that student learning groups were composed at their schools; Andersen's study discovered that employing DI was difficult for the teachers due to the diversity in learners. It concluded that the use of DI impacted positively on the learning of struggling and gifted learners. This is in discordance with the findings of Scott's (2008) study which concluded that DI did not have an overall effectiveness at a significant level. In Scott's findings, learners with higher academic ability benefited significantly with opportunity to be highly challenged while students of average ability did not.

Servilio (2009) conducted a study in a fifth grade classroom which contained learners with physical disability. Just like most schools in Ghana, the school was identified as one located in an area with lower family incomes. The study differentiated instruction in reading, comprehension and personal connection by implementing a seven step program they called “You Get to Choose”. The seven steps the teachers created were:

- (1) identifying student needs and learning styles within your classroom;
- (2) assess current student achievement;
- (3) select empirically based strategies for reading, comprehension, and personal connection;
- (4) differentiate the material for the students with special needs;
- (5) provide options for student choice;
- (6) conduct the assessment;
- (7) evaluate student performance (p. 5).

These steps allowed the teachers to differentiate content, process and products. After the program implementation was complete, it was revealed that the learners’ motivation increased and as such 83.4% of them improved their overall grades.

A qualitative research conducted by Emily (2005) assessed the perspectives of a group of students and parents in school classrooms where DI practices were employed. The study concluded that DI practices implemented at charter school had a positive impact on student growth as determined by student, parent and teacher input.

Logan (2008) examined DI based on the teacher’s respond in a survey research. The results of the survey administered to middle school teachers to determine their level of knowledge in providing DI in the classroom confirmed Haim Ginott’s assertions that teachers are those responsible for creating the environment in their classrooms. It also disclosed that teachers possess the power to make a child’s life in school miserable or happy and most importantly, teachers can be part of a team that believe that all students can learn. Despite teachers’ knowledge of DI, the nationwide survey resulted

that 50 percent said they do not differentiate instruction based on readiness, interest or learning profile because they saw no need to do so; affirming similar claims by Moon, Tomlinson & Callahan (1995). Logan's study further revealed that most general educators feel ill prepared to teach students with diverse learning needs with DI due to its difficulty and complexity. However, majority of the teachers (73.0%) disagreed that DI does not prepare students to compete with the real world in terms of standardisation, testing and examinations.

The purpose of a quantitative survey study conducted by Whipple (2012) was to explore teachers' understanding of DI and their perceptions of their ability to implement DI in primary schools. The survey investigated teachers' understanding of DI and their ability to implement DI based Learner Interest, Assessment, Lesson Planning, Content, Process and Product. There was a general level of understanding and implementation of DI among the participants. However, there was variation between the six components. With regards to its understanding the process, interest and product were the three concepts that appeared to be least understood. The study again revealed that there was a lower rate of teachers' implementation compared to their understanding of DI. The findings specifically indicated that student interest, process, lesson planning, assessment and product had a lower level of implementation. It also discovered teachers struggling with using student interest in implementing the process of DI, varying lesson plans and scaffolding learning, assessing through the process as well as allowing students to use varied products to show what they have learned. The study further found that special education teachers were highly knowledgeable of DI and implemented it at a greater degree than general education teachers. This confirms the findings of Franz (2009) that DI requires deep

knowledge of its theoretical framework, process and ways through which the theory is translated into action. It also proves that teaching is indeed a profession of knowledge that inform classroom practice (Kauchak & Eggen, 2003).

Baumgartner, Lipowski and Rush (2003) implemented DI in three classrooms in a middle-class, suburban school district in northern Illinois to reinforce literacy skills of students who needed remedial assistance and to increase reading achievement. The targeted classrooms consisted of 25 second graders, 27 third graders and 25 seventh graders from a variety of ethnic backgrounds. They differentiated the content, process and products to the learners. Content was differentiated by allowing students to self-select books about a topic they found interesting and matched their ability level. Process was adapted by allowing students to work in a variety of group settings and by giving students a wide range of materials to interact with. Students were grouped according to their learning needs and groups were frequently changed as students' needs changed. Products were adapted by allowing students to choose what assignment and tangible learning outcomes to complete. The survey of Baumgartner et al. also sought to determine students' overall attitudes toward reading. They assessed students before, during and after the 19 week differentiation trial period. The results indicated that students were using more reading strategies at the end of the 19 weeks than previously used. The results of the San Diego Quick Assessment showed increased reading levels in each selected classroom. The students demonstrated a greater mastery of skills in phonics. Moreover, the survey results indicated that students' overall attitudes towards reading increased. The third grade results showed an increment of 13% of students who thought positively about reading, while the second and seventh grade results showed an increase of 8% and 16%, respectively.

A quasi-experimental study was conducted by Williams (2012) to ascertain if incorporating DI practices in the middle school classroom has an effect on students' mathematics performance on standardized assessments. Students who were taught using DI strategies performed better, substantiating the assertion of Tomlinson et al. (2003) that traditional classroom approaches to teaching and learning such as one-size-fits-all have been proven to be an ineffective means of instruction.

All learning groups, including special students, economically disadvantaged, English language learners, and gifted were included to determine if strategies were successful based on specific learning needs. However, the researcher observed deficiencies in effective instructional delivery of DI strategies and suggested the need for ongoing, quality professional development and support for educators. This affirms the need to train and encourage teachers to adopt quality and evidence-based teaching practices that are effective in maximising the learning needs of all learners (Ampiah, 2008).

Woods (2014) conducted a study to determine the effect DI on student achievement in the music classroom. The study also intended to ascertain if there are components of DI that have a greater impact on student achievement than others. The findings provided evidence of student music proficiency growth and achievement after employing DI. The study also resulted that there were components of DI that have greater impact on student achievement than others. These included those DI strategies that were based on pre-assessment and ongoing assessment of students' progress toward key goals. The findings further revealed that schools that implement DI in response to students' diverse learning needs experience significant increment in their

learners' academic achievement. The study generally concluded that DI may be the solution to allow all learners to succeed academically regardless of their diversity.

Hobson (2008) examined the differentiation strategies used by middle school teachers and the frequency with which they practiced DI in their heterogeneously grouped classrooms. Results of the study revealed two types of teachers; those who differentiate frequently and those with little frequency. The disparities in the teachers' use of DI strategies indicated that there were different types of teaching and learning occurring in the same school under different teachers. The findings also revealed that several teachers were not really following models of DI but were simply employing best pedagogical practices; confirming the findings of Koeze (2007) that teachers who did not have training on differentiation may have sporadically used the differentiation variables but unintentionally and those random uses of the strategies did not increase learner achievement. Teachers were highly knowledgeable of differentiated assessment but showcased the least rate of its practice/implementation, and the lowest area of their differentiation was on learning environment. The study again revealed that factors such as teachers' age and years of teaching had little impact on their practice of DI. This disagreed with Abbati's (2012) that high implementers of DI were influenced by background factors such as long experience of teaching the same class.

A research was conducted by Valiande and Koutselini (2009) to evaluate teachers' conception of DI and the effect of employing DI in mixed ability classrooms on academic primary school learners' attainment of students. The findings of the study indicated that most of the teachers in the research reported to have heard a lot about DI but did not really know what it meant. In their study, some of the teachers who purported to have used differentiation in the past did not really differentiate their

instruction but had the misconception they did so by using different teaching methods, different materials and different teaching/ learning activities. This affirms that teachers who are in the best position to differentiate instruction in their classrooms operate from strong and growing knowledge base (Tomlinson & Imbeau, 2010). Their study further revealed that although DI is one of the main teaching approaches in the Cyprus curriculum, yet almost none of the teachers in their research practised DI in their classrooms and none of them received a substantial training on differentiation. This affirms Brennan's (2008) view that there is the need to put in place thoughtful and comprehensive plan for professional development of teachers on concepts like DI.

Koshy (2013) evaluated the benefits of using differentiated assessments to enhance the learning experience and output of students. After employing multiple assessment approaches such as role plays, videos, blogs, and games based on learners' preference, their performance improved and that of average students reflected on their grades.

Gangi (2011) reviewed how Howard Gardner's MI theory can be used as a method to differentiate instruction. The study concluded that using multiple intelligences to differentiate instruction assisted teachers in creating classroom environments that accommodate the learning needs of all learners in basic schools and greatly increased their academic attainments. This agrees with Tomlinson (2000) position that differentiated classroom should be conducive enough to support every kind of DI activity such as flexible grouping, individualised learning, and peer teaching.

2.10 Conceptual Framework

Figure 1 shows the relationship between teachers' knowledge and practices of DI with respect its major theories and concepts. The overall picture illustrates the lacing

and intertwining nature of knowledge and practices of DI. The implementation of DI is dependent on the knowledge the teacher possesses on its principles, theories and concepts and his/her ability to employ them in instructional processes. The diagram below (adopted and modified from Hellman, 2007) shows the conceptual framework of the interplay of teacher's knowledge and practices of DI and its major concepts.

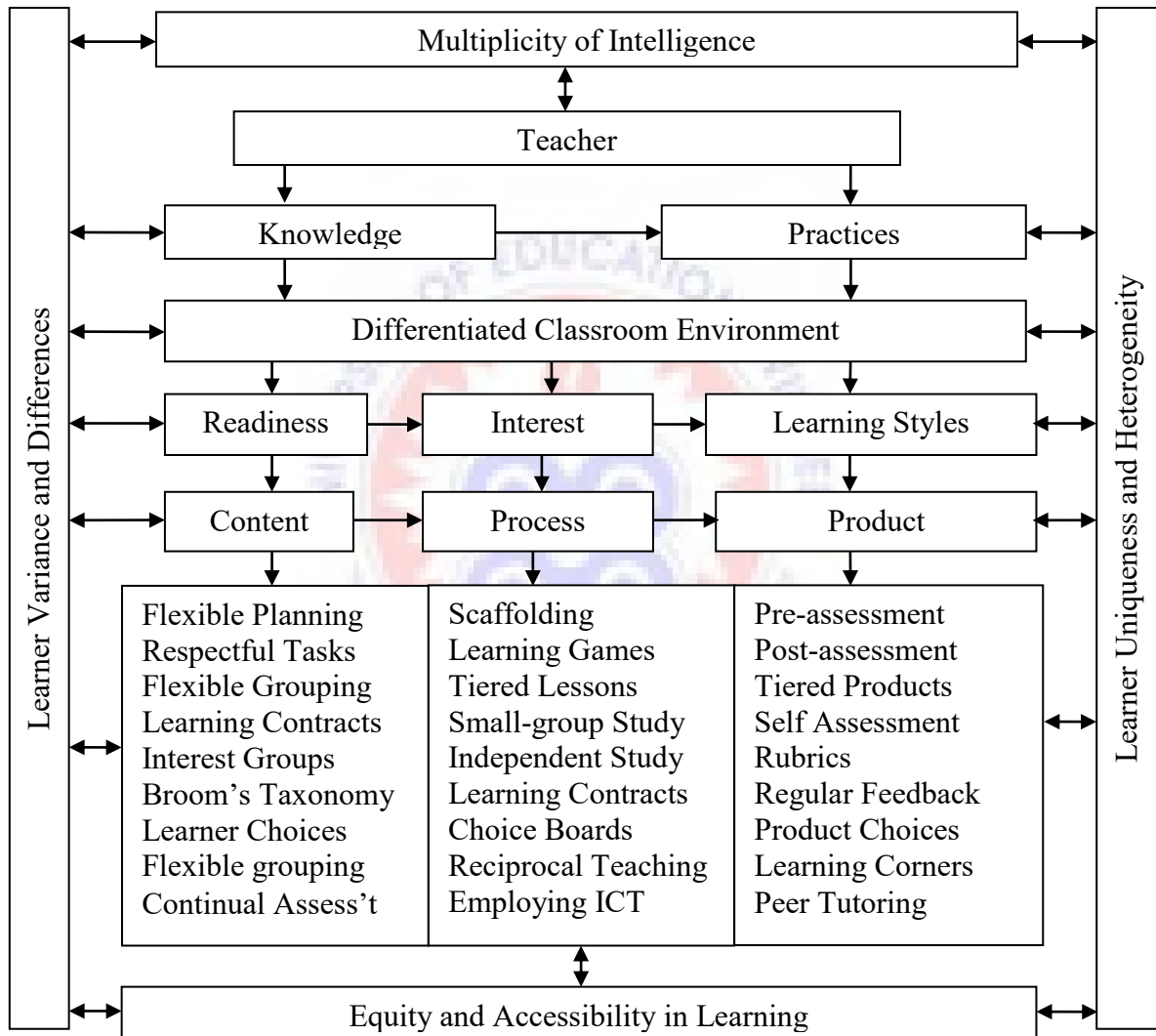


Figure 1:

Conceptual Framework (Teachers' Knowledge and Practices of DI)

The very reason to differentiate instruction is to cater for every learner's learning needs with respect to individual uniqueness, differences and diversities. This position of DI is basically founded on the principle of Multiple Intelligence (MI). The MI theory (pluralistic view of the mind) accounts for the different ways learners think, learn or act and the reason of individual difference (Gardner, 2003). As stated elsewhere, literature proves that the concepts and theory of MI are the very foundations upon which DI is built. And their virtues are tantamount to each other.

Considering the role of the teacher in the teaching and learning process generally, it can be stated that they are the pivots in all educational or academic endeavours of a child's learning. Kauchak and Eggen (2003) report that; teachers are the most critical influence on school learning apart from children themselves. In a normal educational setting, teachers are probably the most influential facilitators in the teaching/learning process. Researches maintain that teachers are known to be professionals in search of knowledge that could inform classroom practice (Kauchak & Eggen, 2003). This pertains that the knowledge a teacher possesses on a professional concept such as DI consequently affects his/her practices positively or negatively.

Having the requisite knowledge of DI is the first and most important step a teacher would need to be able to implement differentiation effectively. Although it is possible for teachers to employ some ingredients of differentiation in their instructional practices without possessing any aorta of knowledge on it, those practices however may not be as regular and as effective as that of those whose have knowledge about it. According to Tomlinson (2010), teachers who are in the best position to differentiate instruction are those have a strong knowledge on the bases and philosophies of DI.

Since DI is considered as a total way through which teachers think and deal with their learners, the thinking and dealings should be born of a strong knowledge of DI practices. Implementing DI requires deep knowledge of its process, theoretical framework and ways through which the theory is translated into action (Franz, 2009). In order not to corrupt their learners, teachers might not want to employ practices that they are not conversant with no matter how beneficial they might think it is to the learners. George (2005) testifies that it deters teachers from attempting to use DI if they lack knowledge and inadequate expertise in its use. Moreover, the extent to which teachers know or understand DI is consequential to its implementing according to Whipple (2012). This teachers' knowledge factor inevitably influences the kind of learning atmosphere that is created for student learning.

Teachers' knowledge and practices of DI are significant to effective learning output. However, they need special classroom environment to be absolutely successful. Several educational theories such as Vygotsky's ZPD and Scaffolding, Cambourne's Conditions for Natural Learning, Clay's Emergent Literacy, Gardner's MI, and Piaget's Cognitive Development among others advocate and advance for inviting learning environment as extremely crucial to effective teaching and learning. The elements involved in a DI classroom environment may include rules, procedures, furniture, available materials, and mood (Tomlinson, 2000).

In a differentiated motivated learning environment, the physical, psychological, social, cultural and emotional practices should be inviting and enticing for every learner. In another development, affect which entails the social and emotional factors that influence learning requires teachers to adjust to accommodate every learner's

learning needs by treating them in a way that they will feel safe, comfortable and willing to take risks in their learning (Wormeli, 2007). With respect to this, differentiated learning environment should entail the physical space, the way it is arranged, how well every learner is treated and how each learner is encouraged and motivated to learn to his/her maximum capacity. In all, DI classroom environment provides learners with a more inviting atmosphere to learn (Gangi, 2011). When the expected differentiated environment is created, the teacher can then take the next step to differentiate other areas/aspects of instruction.

Instruction can be differentiated from planning through to assessment. Any aspect of instruction that a teacher alters in order to cater for the differing learning needs of his/her learners entails a differentiation. Tomlinson (2001) reiterates that anytime teachers modify the way a lesson is presented or moderates an assignment for a particular learner, they are differentiating their instruction. The four main areas projected by several researchers and educators (Tomlinson & Allan, 2000; Heacox, 2002; Wormeli, 2007; Levy, 2008; Launder 2011) through which instruction can be differentiated include content, process product and learning environment. Another area that can be differentiated apart from these four is planning. Any of the areas of instruction can be differentiated to address the diverse learning needs of all learners and to help every particular learner to learn to the maximum.

All areas of instruction can be differentiated based on major learner characteristics. Gangi (2011) affirms that a teacher must address three student characteristics identified by Tomlinson as readiness, interest and learning profiles in order to differentiate instruction. Learner readiness is how much background knowledge a

learner possesses in relation to a topic, learner interests are the topics that the learner is ready to learn which will motivate him/her to be engaged in learning while learning profiles of the learner involves how the learner learns (Gangi, 2011). However, a teacher who intends to differentiate instruction effectively must consider these learner characteristics to be able to do so.

Fundamentally, all the practices of differentiation can be implemented at every stage or aspect of instruction through a variety of teaching/learning activities. These kind of activities include flexible planning, respectful tasks, flexible grouping, continual assessment, learning contracts, interest groups, Bloom's taxonomy, learner choices, flexible grouping, scaffolding, learning games, tiered lessons, small-group study, independent study, learning contracts, choice boards, reciprocal teaching, the use of ICT, pre-assessment, post-assessment, tiered products, self assessment, rubrics, regular feedback, product choices, learning corners, peer tutoring, etc. Although all of these activities are not supposed to be employed in a single instruction, series of them should be considered in every aspect of differentiation.

The basic aspect of this DI framework is that, all the practices illustrated above should be guided by the fundamental learner conceptualisations and principles. These include the learner diversity, learner variance, learner uniqueness and learner difference, multiplicity of learner intelligence and equity and accessibility of learning to every learner. These are the very concepts which prove that learners are not homogeneously equal and should not be treated as such in terms of instructional delivery. Perhaps, these are the very basis upon which instruction must be differentiated.

2.11 Summary of Literature Review

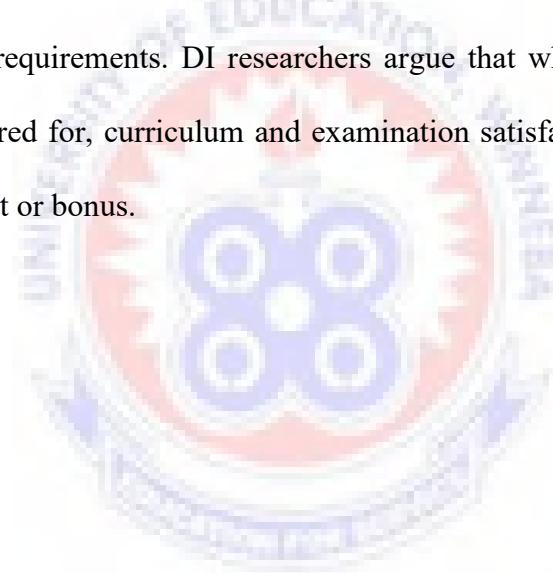
Research findings prove that there is a quest for quality education for all throughout the world. Every particular nation prioritises educating its citizens and as such commits a lot of resources towards its attainment. This educational aspiration is seeking to be achieved through effective instructional practices and approaches. There have also been greater efforts by educationists the world over, seeking for instructional practices that can be used as a panacea to all kinds of educational failures. However, the best instructional practice that has been proposed and commended is Differentiated Instruction.

Throughout the literature, there has not been a specific definition for DI. Various researchers describe DI in various ways such as being an approach, a concept, a strategy, a method, a practice, a process and a total way of teaching and so on. Literature also reveals numerous aspects, concepts, practices and generalisation of DI. However, while few literature points out the setbacks in employing DI; several studies project the merits in its implementation despite its complex nature.

In another development, the diversity, difference, heterogeneity and variance of learners prove that learners are not homogeneously equal and should not be treated as such in instructional delivery. This has been the basis upon which current effective educational practices (such as DI) are built. Arguments in the literature suggest that each learner in a classroom is uniquely different from others and as such each of them has his/her own background knowledge, readiness, interest, learning style and learning needs. It has thereby been affirmed that the best instructional practices are those that consider all these learning differences of learners and cater for them. All these are done so that every child can learn which in turn necessitate the use of DI.

Literature on DI moreover suggests that it can be employed in any classroom, at any grade, to any group of learners and in any subject of study. It has also been ascertained that teachers can differentiate their instructions mainly through planning, content, process, product and learning environment. DI comprises several concepts and generalisations as well as strategic activities that catalyst its effective implementation.

According to the literature, DI is a learner-centred approach to teaching/learning that places the learner at the centre of learning. It advocates catering for the learning needs of each individual learner in a classroom instead of teaching to satisfying curriculum or examination requirements. DI researchers argue that when the learning needs of learners are catered for, curriculum and examination satisfaction comes with it as an additional benefit or bonus.



CHAPTER THREE

METHODOLOGY

3.0 Overview

The main aim of this study is to investigate teachers' knowledge and practices of Differentiated Instruction (DI) in Ghanaian primary schools. This chapter presents the research design, setting, population, sample and sampling technique, instruments, piloting of instruments, validity and reliability of instruments, data collection procedure, data analysis procedure and ethical consideration.

3.1 Research Design

The study employed a survey research design with mixed method instruments for data collection. Mixed method research is a systematic integration of both quantitative and qualitative methods in a single study in order to ascertain a deeper understanding and a full picture of a phenomenon (Yin, 2006). According to Rossman and Wilson cited by Koeze (2007), using mixed method which entails a combination of qualitative and quantitative study methods, allows the researcher to “confirm or collaborate findings” (p. 40). A combination of Qualitative and Quantitative data allows researchers to discover new insights into studies (Koeze, 2007). A questionnaire and an observation guide were used to collect quantitative data and qualitative data were collected with a semi-structured interview on teachers' knowledge and practices of DI.

3.2 Setting

Kwabre East is one of the 30 Districts in the Ashanti Region of Ghana. It was carved out of the former Kwabre District and is located almost at the centre of Ashanti Region. It is within latitudes 60⁰ 44' North and longitudes 10⁰ 33' to 10⁰ 44' West.

The District shares boundaries with Afigya Sekyere District to the North, Kumasi Metropolitan Assembly to the South, Ejisu-Juaben Municipal to the Southeast, Afigya Kwabre District to the West and Offinso Municipal to the Northwest. The District has a total land area of 246.8 square kilometres constituting about 1.01% of the total land area of Ashanti Region. The District capital, Mampong, is approximately 14.5 kilometres from Kumasi to the north east. There are 33 towns and villages, 86 settlements, administered under 3 paramuncies, 1 parliamentary constituency, 11 Area Councils and 42 District electoral areas (www.ghanadistricts.com).

The dominant civil occupation in the district is teaching. Besides, its inhabitants engage mainly in crafts and agricultural activities as well as trading. The various towns in the Kwabre East District are known for the famous kente weaving, adinkra making, wood carving, small scale farming and trading in these crafts. This notwithstanding, the district has numerous socio-educational needs such as educational infrastructure and amenities for both students and teachers. The shaded portion of the figure below shows the geographical area of the Kwabre East District within the Ashanti region of Ghana.



Figure 2:

Geographical Area of Kwabre East District in the Ashanti Region of Ghana.

3.3 Population

A research population refers to all of the events, individuals or things that are to be represented in a study (Christensen, 1991). This study targeted all public primary school teachers in the Ashanti Region. Kwabre East District has seven Senior High Schools and 142 public basic schools. The public basic schools comprise 67 primary and 75 Junior High Schools. The accessible population was 475 public primary school teachers from the 67 primary schools in the Kwabre East District.

3.4 Sampling Techniques

The Kwabre East District was purposively selected because of accessibility and proximity to the researcher. Also, the researcher found it easy to elicit the cooperation of the teachers and was able to easily move around. First of all, all primary schools in the district were purposively selected for the study. The Kwabre East District has been divided into 8 educational circuits. Simple random sampling method with replacement was used to select 48 out of 67 primary Schools in the district. Thus, 6 schools from each of the 8 circuits for a fair representation. Each school in a circuit was represented by a number on a piece of paper. The pieces of paper were folded and placed in a single container for random picking. Whenever a piece of paper was picked from the container, the name of the corresponding school was recorded. The paper was folded and put back into the container which was shaken for another pick. When a number picked previously was picked again, it was put back into the container for another one so that every school had equal chance of being picked. The process was repeated until the required number of schools was picked. Teachers who were willing to participate in the study were selected. One hundred teachers volunteered to participate in the

study with at least 2 teachers from each school, except in two schools where 4 each who volunteered to participate were selected for the study since each of those two schools had a double stream. In all, 100 primary school teachers comprising 48 males and 72 females were sampled for the study.

3.5 Instrumentation

The instruments used to collect the data for the study were questionnaire, observation and interview. In order to obtain information on the knowledge or perception of people, Seidman (2006) and Launder (2011) suggest that questionnaires offer opportunities that allow the researcher to obtain relevant data as well as allowing freedom for the participant in order to expand the information. A structured questionnaire was used to collect data on the teachers' knowledge of differentiation. Observation and a semi-structured interview were used to collect data on the support of school environment as well as teachers' practices of differentiation in Ghanaian primary school classrooms. According to Mensah and Dandy (2012), the best research instruments that are used to collect data on people's place of work and practices are observation and interview. This is because observation and interview help a researcher to gain insight into events in a study.

3.5.1 Questionnaire

A Differentiated Instruction Questionnaire (Appendix A) was adapted from the works of Hellman (2007), Hobson (2008) and Whipple (2012) by selecting the items that suited the contexts of this study. Some of those items on the original instruments were modified and reframed to suit the local context of the study. Data results from the questionnaire was used to answer research question one.

The questionnaire comprised two parts A and B (Appendix A). The first part which consisted of 4 items sought to elicit information on the background and professional characteristics of the participants. The items specifically sought to collect information on respondents' sex, professional qualification, years of teaching, classes in which they taught at the time of the study and their class sizes.

The second part aimed at soliciting information on the respondents' knowledge of differentiation. It consisted of 46 items of a five-point Likert type scale with options Strongly Disagree [SD] = 1, Disagree [D] = 2, Not Certain [NC] = 3, Agree [A] = 4 and Strongly Agree [SA] = 5. Seven items were on participants' knowledge of learner diversity, four on learner interest and three items on learners' learning style. There were four items on differentiated lesson planning, four on differentiation of content, four items on differentiating Environment and four on general concepts of DI. Also, 10 items were on differentiating process and six were on differentiating products or assessment.

3.5.2 Observation Schedule

The researcher used an observation to collect data to support research question one and answer questions two, three and four. The observation checklist was adopted from the works of Hellman (2007), Hobson (200) and Whipple (2012) and was modified by the researcher (Appendix B). Some of the items on the original instruments that suited the contexts of this study were selected, modified and reframed to suit the local context of the study. Observation is more accurate when a researcher needs an on-the-spot evidence of information and where the researcher cannot acquire accurate information by just questioning respondents. It is also more appropriate for studying learning interactions and behaviours of people in a naturally occurring environment.

Observation of issues or phenomena in their natural settings allows the researcher to understand behaviours of respondents (Lichtman, 2006).

The first part of the observation sought the demographic information of respondents. The second part used an eight item checklist and sought to ascertain the learning environments of the primary schools and their support of DI. This part had weightings of Poor = 1, Satisfactory = 2, Needs Improvement = 3, Good = 4 and Excellent = 5. The third, fourth and fifth aspects had 6, 7 and 6 items and explored teachers' practices of DI content, process and products respectively with weightings Scarcely/No = 1, Little = 2, Often = 3 and Steady = 4).

3.5.3 Interview

A 30-item semi-structured interview guide (Appendix C) was used to clarify any disagreement in teachers' knowledge of DI and to obtain in-depth information on teachers' practices of DI. The interview was subsequently conducted on teachers' whose practices were observed. According to Atindanbilla (2013), an interview is appropriate when a researcher needs more detailed answers from respondents who are willing to talk. Also, Creswell (2007) sees interview as an investigative instrument involving a person-to-person interaction between a researcher and a respondent in which specific answers are sought by asking specific questions. An interview allows a researcher to learn about the experiences of others and the meaning they derive from those experiences (Seidman, 2006).

3.6 Piloting of Instruments

The instruments for the collection of data were pilot tested to further determine their validity and reliability. Fifty teachers from 25 primary schools selected from Sekyere East district were used for the pilot test. Sekyere East District is similar to Kwabre

East District. It is a sub-urban district which possesses characteristics of both urban and rural schools just like Kwabre East District. The teachers have characteristics similar to those of their colleagues used for the study. The study was done in two parts. The first part involved administering questionnaires to the teachers while the second part involved classroom observation which was followed by interview. The results of the pilot led to further modification of the instruments.

3.7 Validity of Instruments

The instruments; questionnaire, lesson observation and interview schedule were given to senior lecturers in the Department of Basic Education, University of Education, Winneba to determine their content validity and to identify the ambiguities in the items. This was to ensure that the items reflected the intent of the researcher. Validity of a research instrument is concerned with how well it measures the concept it is intended to measure (Awanta & Asiedu-Addo, 2008). Content validity is the extent to which a measurement reflects the specific content domain intended to be measured (Atindanbilla, 2013).

The face validity of the questionnaire and the lesson observation protocol was also established with the help of some senior lecturers at the Basic Education department in the University of Education, Winneba. Face validity pertains to whether the test looks valid to the examinees who take it, the administrative personnel who decided on its use and other technically untrained observers (Alhassan, 2006). Thus, face validity refers to how obvious a test is and the degree to which the purpose of the test is apparent to those taking it. The questionnaire items, lesson observation and interview schedule were modified based on the feedback from the senior lecturers. Their comments led to the correction of typographical errors and clarification of elements of

ambiguity in the instruments. Data from the pilot test indicated that items in the questionnaire proved to be clear and explicable to the fifty teachers from Sekyere East District who were used for the pilot test, therefore proving to be valid.

3.9 Reliability of Instruments

Reliability entails the extent to which a questionnaire, test, observation or any measurement produces the same results on repeated trials (Sounders, Lewis & Thornhill, 2007). It is the stability or consistency of scores over time or across raters. In order to ensure the reliability of the questionnaire items, a pilot study involving 50 primary school teachers from 20 schools in the Sekyere East district was conducted. The teachers used in the pilot sample were not involved in the actual study. The reliability of the questionnaire was then determined with the help of the SPSS version 20. The Cronbach's Alpha reliability co-efficient obtained for the internal consistency of the questionnaire was 0.74. The Cronbach's Alpha reliability coefficient for the five sub-scales using the individual teacher as the unit of analysis, ranged from 0.682 to 0.799 and with a satisfactory mean value of 0.741. According to Atindanbilla (2013) co-efficient of reliability value above 0.7 is considered reliable.

The lesson observation protocol was also piloted with the same teachers used in the pilot study. Samples of the lesson observation protocol were used to observe lessons by different graduate student (a co-observer) to determine the measure of agreement in the reliability of the data. The co-observer was trained by the researcher on how to use the observation schedule. A percentage inter-rater agreement was determined and it was found to be 73.7%. According to Altman (1999), when a kappa (k) value is less than 0.20, it is in poor agreement, a (k) value between 0.20 and 0.40 is a fair agreement, a (k) value between 0.40 and 0.60 signifies a moderate agreement, a (k)

value between 0.60 and 0.80 entails a good agreement and a (k) value between 0.80 and 1.00 implies is a very good agreement. This suggested that the lesson observation schedule of $k = 0.737$ was in good agreement and could be used for the study.

The interview was conducted to check for subjectivity and biasness of the questions on the interview guide. The recorded responses of the respondents were played back to them for them to clarify and verify their responses. The responses from the respondents were transcribed verbatim and presented to respondents to go through to check for omissions and additions where necessary. Reliability/trustworthiness of the interview guide was determined through a peer review process where the recorded interview responses were compared to its corresponding transcription. The recorded interviews and their correspondent transcriptions were given to other graduate students to check their correspondence.

3.10 Data Collection Procedure

A letter of introduction (Appendix D) obtained from the Department of Basic Education, University of Education, Winneba was used to seek permission from the District Director of Kwabre East Directorates of the GES to conduct the research (Appendix E). The permission obtained was further used to get the consent of the head teachers and the teachers of the various schools. The data were collected in two phases. The first phase which took three weeks were used to administer the questionnaire. Each school was visited at least twice. The first visit was used to fix the date for the administration of the questionnaire. The second (or other) visits were used for the administration and collection of the questionnaire. The questionnaires were personally administered by the researcher. This gave the researcher the opportunity to

clarify any uncertainty that arose from the questionnaire. It also enhanced a faster completion of the items and aided 100% retention of the questionnaires distributed.

The second phase which lasted for five weeks was used for classroom observation and interview. The observation and interview were conducted concurrently. Every teacher who was observed was interviewed immediately after the observation. The observation and interview were used to determine primary school teachers' knowledge, pedagogical and assessment practices of DI as well as primary schools' learning environment support of differentiation. A sub-sample of 15 teachers was selected in the second phase of the study. The teachers were selected based on the results of the questionnaire. The sub-sample included teachers with knowledge of DI, teachers who were uncertain and those who possessed little or no knowledge of DI. Each participant was observed once for 60 minutes equivalent to two-period lesson delivery. The observation was about how the teachers practiced DI and also in terms of their responses to the questionnaire items. Each observed participants was interviewed after every lesson. The interview was done in a form of a post-observation conference to clarify issues that arose from either the questionnaire or the observation schedule. Responses of the participants to the interview questions were recorded and played back to them to verify their accuracy.

3.11 Data Analysis

The data for this study were analysed using both qualitative and quantitative approaches. The qualitative data for the study were analysed thematically by word description and the quantitative data were analysed statistically and presented in tables.



3.11.1 Quantitative Data Analysis

Descriptive statistics was used to analyse the data quantitatively. The quantitative data for this study were analysed using SPSS version 20 (2014). It was used to summarize, organise and reduce large data into interpretable forms (means, standard deviations, frequencies and percentages).

The responses of the participants to the items in section A of the questionnaire were organised into frequency counts and later converted to percentages, and were used to describe the background characteristics of the participants. The sums of the numerical marks for the options selected by the participants in the second Part of the questionnaire were determined and their mean scores together with their standard deviations calculated. The items of the questionnaire were classified into nine major concepts. The mean score for each sub-concept was computed. A mean average of the mean scores was determined which was used as a criterion to group the participants' based on their level of knowledge of DI. A mean value below, around and above the average mean value respectively indicated a low, an average and a high level of teachers' knowledge of DI.

3.11.2 Analysis of Data from Classroom Observation Schedule/Checklist

The descriptive function of the SPSS was used to organise the observation data into frequency counts which were also converted into percentages. The observation schedule/ checklist was used in the teachers' lessons observed. The sums of the numerical weights for the observed features of the classroom environments (Part 1) or practices or strategies (Part 2) were determined and then converted into percentages.

3.11.3 Qualitative Data Analysis

The validity and accuracy of the interview data was ensured by playing back the recorded audio-interviews to the respondents for confirmation. The data were

transcribed verbatim. The transcriptions were read severally to identify unique themes that best answered the research questions. This was done by rereading and analysing for relationships among ideas and putting them into sets on the basis of logical similarities (Miles & Huberman, 1994). They were then grouped together into broader integrating themes. The qualitative data gathered were analysed thematically through word description with respect to relatedness of issues relevant to the study. The results were used to support the findings for research question 1 and to answer research questions 2, 3 and 4. The results were compared to find out whether what the teachers said during the interview was actually what they practiced during instruction.

3.12 Ethical Consideration

To ensure a higher ethical consideration and standard of the study, the researcher first acquired a letter of introduction (Appendix D) from the Basic Education Department of the University Of Education, Winneba in order to contact all necessary authorities for the conduct of the study. Permission was further obtained from the Kwabre East Education Office Directorate (Appendix E) and consequently from head teachers of the schools that were involved before the research commenced. The teachers were allowed to volunteer their participation. The researcher clearly explained the objectives for this study to the participating teachers. The research instruments were developed in a way that would not invade the privacy of the participants or criticise the teaching methods employed by them. Confidentiality was ensured during transcription of interview, analysis and reporting as teachers' names and locations were not disclosed.

CHAPTER FOUR

RESULTS

4.0 Overview

This chapter presents the results of the study. The chapter reports the demographic data of the participants, analysis of the questionnaire, observation and interview data and answers the research questions. The results are also discussed in this chapter.

4.1 Background Information of Participants

A total of 100 teachers from primary schools in the Kwabre East District of Ashanti Region, Ghana participated in the study. Details of their background information are presented in Table 1.

Table 1:

Summary of Demographic Characteristics of Participants.

| Variable | Category | Frequency | Percentage |
|-----------------------------------|-----------------|------------------|-------------------|
| Gender | Male | 48 | 40 |
| | Female | 72 | 60 |
| | Total | 120 | 100 |
| Professional Qualification | Cert 'A' | 9 | 7.5 |
| | Diploma | 48 | 40 |
| | Degree | 59 | 49.2 |
| | Others | 4 | 3.3 |
| | Total | 120 | 100 |
| Years of Teaching | 1-3 | 18 | 15 |
| | 4-6 | 36 | 30 |
| | 7-9 | 20 | 16.7 |
| | 10 and above | 45 | 37.5 |
| | Total | 120 | 100 |
| Class/Grade | 1 | 15 | 12.5 |
| | 2 | 13 | 10.8 |
| | 3 | 19 | 15.8 |
| | 4 | 25 | 20.8 |
| | 5 | 23 | 19.2 |
| | 6 | 25 | 20.8 |

| | | | |
|------------------------|-----------------------|------------|------------|
| | Total | 120 | 100 |
| Type of Teacher | General Education Tr. | 120 | 100 |
| | Special Education Tr. | 0 | 0 |
| | Total | 120 | 100 |

Forty percent (48) of the sample were males while 60% (72) were females. The sample had varied professional qualification. About 49.2% (59) obtained Bachelor of education Degree, 40% (48) had Diploma in Education, 9% (7.5) had Teachers' Certificate 'A' and the remaining 3.3% (4) held other qualifications.

The primary school teachers varied in the number of years of teaching. Fifteen percent (18) of the teachers had taught for a period between 1-3 years, 30% (36) of them had taught between 4-6 years, 16.7% (20) had also taught for a period between 7-9 years while the remaining 37.5% taught for 10 years and above.

The teachers were selected across all the classes of the primary schools. Out of these teachers, 12.5% (15) taught in class 1, 10.8% (13) of the teachers taught pupils in class 2, 15.8% (19) were class 3 teachers, 20.8% (25) were class 4 teachers, 19.2% (23) of them taught in class 5 while 20.8% (25) of the respondents taught in class 6. The result of the study revealed that, all the 120 (100%) participants were general education teachers, with no teacher having specialties in Special Education.

4.3 Analysis of Quantitative and Qualitative Data

The first and second phases of the study involved the collection of quantitative data through a questionnaire and an observation to ascertain primary school teachers'

knowledge and practices of DI. Data from the questionnaire were solicited from a total sample of 100 teachers while the observation entailed a sub-sample of 15 teachers. Descriptive statistics were used to determine the means and standard deviation of the questionnaire data while frequencies and percentages were used to report findings from the observation data.

The third phase of the study involved the collection of qualitative data through a semi-structured interview with a sub-sample of 15 primary school teachers. A 30-item semi-structured interview schedule was used to solicit information from the respondents. The classroom interviews were conducted as a post-observation conference to ascertain further primary school teachers' knowledge and practices of DI. The interviews were conducted immediately after each observation and were used to clarify claims and issues in the study. The responses from the interviews were audio-taped and transcribed. The transcripts were read over and over again to identify the unique themes that best correspond to research questions.

4.3.1 Primary School Teachers' Knowledge of Differentiated Instruction

Research question 1: How knowledgeable are Kwabre East District primary school teachers of Differentiated Instruction?

This research question sought to ascertain primary school teachers' knowledge of differentiated instruction. Knowledge of the respondents in the study was sought under nine major concepts of differentiation namely learner diversity, learner interest, learning styles, lesson planning, content, process, product/assessment, environment and general differentiation ideologies. A five-point Likert scale questionnaire with 46 items, grouped under 9 sub-headings was used to collect information on primary school teachers' knowledge of DI. Respondents' mean scores far below the average mean (<15.00) were considered to have low knowledge, those closer to it (15.00 –

20.00) as average knowledge and those above (>20.00) it as higher knowledge. The mean scores and the standard deviations of the teachers' responses and detailed results of the analysis are presented in Table 2.

Table 2:

Primary School Teachers' Level of Knowledge on the Major Concepts of Differentiation.

| Major Concepts of Differentiation | <i>Ms</i> | <i>SD</i> |
|--|------------------|------------------|
| Learner Diversity | 20.08 | 3.40 |
| Learner Interest | 15.81 | 2.32 |
| Learning Style | 11.02 | 2.56 |
| Lesson Planning | 13.97 | 2.78 |
| Content | 12.47 | 2.30 |
| Process | 32.90 | 5.22 |
| Product/Assessment | 22.13 | 3.24 |
| Environment | 15.78 | 5.60 |
| General | 13.92 | 3.53 |
| <i>Ms = Means SD = Standard Deviation Average Mean (AM) = 17.56</i> | | |
| <i>Average SD = 3.44</i> | | |

The means (*M*) ranged from 11.02 to 32.90 and the standard deviation (*SD*) ranged from 2.30 to 5.60. The respondents obtained the lowest mean (11.02, *SD* =2.56) on pupils' learning styles and the highest mean on process (32.90, *SD* = 5.22).

Results from Table 2 indicate that the respondents were generally knowledgeable of the major concepts of DI. The teachers recorded the highest mean on Process (*M* = 32.90 and *SD* = 5.22) and the lowest mean (*M* = 11.02 and *SD* = 2.56) on *learning style*. The means of the respondents' responds for items on *process, product/*

assessment and *learner diversity* were greater than the sample's overall or average mean [*AM*] (17.56). While those for differentiation through *learner interest* and *environment* were closer to the *AM*, those for differentiating through *lesson planning*, *general concepts*, *content* and *learning style* were less than the *AM*.

From Table 2, the teachers seemed to possess the highest knowledge on *process* differentiation. Per the total sample population, the *process* concept recorded $M = 32.90$ and $SD = 5.22$, projecting it highly above the *AM* and as such the highest among the sub-concepts. Details of the items assessing teachers' knowledge of differentiation based on process are presented in Table 3.

Table 3:

Primary School Teachers' Knowledge of Differentiation based on Process

| <i>Items</i> | <i>Ms</i> | <i>SD</i> |
|---|-----------|-----------|
| Teaching/Learning activities should mainly/primarily be based or centred on individual pupil's needs during lesson delivery | 3.5 5 | 1.20 |
| Lessons should be taught strictly in order to complete the syllabus instead of varying instruction to satisfy learner needs | 2.3 6 | 1.37 |
| Each learner in the classroom should be allowed to choose his/her own preferred way of learning | 2.5 0 | 1.32 |
| Learner groups in the classroom should be formed based on learners' abilities, interests, styles and learning preferences | 3.5 2 | 1.17 |
| Students should be provided with the choice to work alone, in pairs or in small groups during teaching/learning | 3.3 7 | 1.23 |
| Some pupils can be given individual attention during teaching | 4.1 7 | 0.96 |
| A variety of teaching methods should be used during teaching | 4.4 8 | 0.73 |
| I am familiar with entering into learning contracts with pupils | 3.0 9 | 1.16 |
| I am familiar with engaging learners in tiered activities/lessons | 2.9 | 1.13 |

| | | |
|--|-----|------|
| | 6 | |
| I am familiar with scaffolding learners in teaching/learning | 2.9 | 1.13 |
| | 0 | |

From Table 3, the means ranged from 2.36 to 4.48 and the *SD* ranged from 0.73 to 1.37. The respondents obtained the lowest mean (2.36, *SD* = 1.36) on the item which inquired about teaching lessons strictly to syllabus instead of varying instruction to satisfy learner needs, and the highest mean (4.48, *SD* = 0.73) inquired whether a variety of teaching methods should be used during teaching.

A further probe on the participants' knowledge on process differentiation revealed that 12 of them knew that lessons should be taught to satisfy individual pupils in the classroom instead of the syllabus, while the remaining 3 (Tr. 3, Tr. 4 and Tr. 8) did not know. Moreover, all the respondents knew that a variety of teaching methods and strategies such as discussion, activity, role-play, dramatisation, questioning, brainstorming and lecture should be employed during teaching. They also knew about group work and problem solving activities as well as other teaching and learning strategies. All the teachers again knew that learner-groups are formed based on ability, intelligent and knowledge levels.

The teachers' level of knowledge on *product/assessment* of differentiation ($M = 22.13$, $SD = 3.24$) which is also higher than the *AM* recorded a higher level of knowledge. Details of the items assessing the teachers' knowledge of differentiation based on assessment/product are presented in Table 4.

Table 4:***Primary School Teachers' Knowledge of Differentiation based on Assessment.***

| Items | <i>M</i> | <i>SD</i> |
|--|-----------------|------------------|
| Questions asked during teaching should only measure pupils' understanding and progress on the content being taught | 3.65 | 1.18 |
| Pupils should be provided with the choice to work alone, in pairs or in small groups during classroom assessment | 3.38 | 1.27 |
| I provide variety of assessment tasks for pupils to choose from | 3.27 | 1.24 |
| A variety of assessment tools/strategies should be employed before, during, and after teaching and learning | 4.32 | 0.76 |
| Every learner must work on the same assessment tasks | 3.43 | 1.36 |
| Assessment should not be separated from learning | 4.08 | 0.97 |

Table 4 indicates that the means for the items ranged from 3.27 to 4.32 and the *SD* ranged from 0.76 to 1.36. The item which obtained the lowest mean (3.27, *SD* = 1.24) was on providing variety of assessment tasks for pupils to choose from, and the highest mean (4.32, *SD* = 1.24) inquired about the use of a variety of assessment tools or strategies before, during, and after instruction.

Results from the interview data on assessment/product differentiation indicated that, all the respondents knew that assessment information should be applied to guide instructions. Apart from Tr. 2, all the other 14 respondents further knew that a variety of assessment tools and strategies should be employed before, during and after teaching and learning. However, all the respondents had the misconception that providing a variety of assessment options for pupils implies giving them a variety of examination questions to choose from. When the researcher clarified their

misconceptions, they all disagreed knowing that assessment tasks could be done in any other way at the basic levels apart from the traditional paper and pen methods.

The teachers' level of knowledge on differentiation through *learner diversity* was also higher. With a mean (20.08, $SD = 3.40$) higher than the *AM*, it recorded a higher level of teachers' knowledge. Details of the items assessing the teachers' knowledge of differentiation based on learner diversity are presented in Table 5.

Table 5:

Teachers' Knowledge of Differentiation based on Learner Diversity.

| Items | <i>M</i> | <i>SD</i> |
|--|-----------------|------------------|
| I see all pupils in my classroom as homogeneously the same | 2.21 | 1.24 |
| Pupils in my classroom have the same learning characteristics | 1.86 | 1.17 |
| Every classroom has pupils with learning disabilities/abilities | 3.51 | 1.24 |
| Gifted learners are also special pupils who need extra attention | 3.61 | 1.32 |
| Lessons must be taught to satisfy each learner in the classroom | 3.73 | 1.23 |
| Lessons must be taught to all pupils generally in the same way | 2.80 | 1.41 |
| Every learner in the same class should understand the content after teaching a lesson using the best single method of teaching | 2.37 | 1.24 |

Table 5 shows that the means for the items ranged from 1.86 to 3.73 and the *SD* ranged from 1.17 to 1.41. The item which obtained the lowest mean (1.86, $SD = 1.17$) was on the sameness or otherwise of pupils' learning characteristics, and the highest mean (3.73, $SD = 1.23$) was on teaching to satisfy each learner in the classrooms.

Out of the total sub-population of 15, two of the respondents (Tr. 2 and Tr. 4) agreed to the idea that pupils in their classrooms possess the same or similar learning characteristics. In explaining their affirmative positions, they gave the reasons that the

pupils have the same learning characteristics since they are in the same age group, and are alike in growth and development. The other group comprising 13 teachers disagreed that pupils have the same or similar learning characteristics even if they are in the same class. Their reasons were based on natural individual differences. For instance 8 of them (Tr. 1, Tr. 3, Tr. 6, Tr. 7, Tr. 12, Tr. 13, Tr. 14 and Tr. 15) opined that, since human beings are naturally different from another in backgrounds, children and their learning could never be characteristically the same. The views of the other 5 who were among the 13 teachers are presented:

Tr. 5: No, they can never be the same because we have pupils who grab whatever you teach them and there are others who would have to be taught again and again by others, or even learn it themselves.

Tr. 8: Not at all. Well, it is because each of them has the way he/she thinks... some are slow thinkers while others are average or fast thinkers.

Tr. 9: No, because each one of them has his/her own intelligence level and it informs their way of learning.

Tr. 10: You know, while some of these pupils inherited higher IQ from their parents, others inherited a lower IQ. Again, while some of the children have supportive learning environments that help them to learn, others have not, so they will never be the same or have the same learning characteristics.

Tr. 11: They are not the same because some of the pupils are fast learners while others are slow learners.

When the respondents were asked if their pupils have academic, emotional, social and physical needs, two of them (Tr. 1 and Tr. 10) posited that their pupils have none of such needs while the remaining 13 agreed that their children have diverse needs. All the 13 teachers further revealed that they identify the diverse needs of their learners through observation, tests, informal interviews and normal teacher-pupil interactions or communication. On how they address those needs, they said they do so through counselling or advice when the need arises, and consult their head teachers when those problems are beyond them. They oftentimes invite the children's parents to discuss some of the problems when necessary. However, Tr. 5, Tr. 6 and Tr. 9 gave detailed explanations to solving each of the stated learner needs:

Tr. 5: I address their academic needs by varying my teaching techniques, strategies and materials. With their emotional needs I talk to them and sometimes to their parents, while I counsel them on their social needs. If it is a material need, I offer a helping hand in terms of money, learning materials and other school items only if it is within my means.

Tr. 6: With the academic needs I give them enough time and offer them special attention but with other needs I just counsel them.

Tr. 9: Well, I go to them, talk to them one-on-one and try to find solutions to their emotional problems. If it is academic, I find another way to teach them again. But I don't go into their social problems at all.

The teachers' level of knowledge on differentiation based on *learner interest* (15.81, $SD = 2.32$) which was closer to the *AM* recorded an average knowledge. Details of the items assessing the teachers' knowledge of differentiation based on learner interest are presented in Table 6.

Table 6:***Teachers' Knowledge of Differentiation based on Learner Interest***

| Items | <i>M</i> | <i>SD</i> |
|--|-----------------|------------------|
| Every pupil in the classroom has his/her own learning interest | 4.12 | 0.86 |
| Every individual learner has learning culture and expectations | 3.84 | 0.84 |
| Every pupil's interest, cultures and expectations should be considered when teaching | 3.84 | 0.95 |
| Individual pupils' life situations impact their learning greatly | 4.00 | 0.99 |

The means for the items ranged from 3.84 to 4.12 and the *SD* ranged from 0.84 to 0.99 (Table 6). The item which obtained the lowest mean (3.84, *SD* = 0.95) was on whether every pupil's interest, cultures and expectations should be considered when teaching, and the highest mean (4.12, *SD* = 0.86) was on whether every pupil in their classrooms has his/her own learning interest.

When the teachers' knowledge on differentiating through learner interest was further probed, majority (13) of them confirmed knowing that every pupil in their classrooms has his/her own learning interest, culture and expectations. Two of the interviewees on the other hand said they did not know about their learners' interest, culture and expectations. However, nine of the 13 teachers could not explain learning interest, culture and expectations in the context of DI. Attempts were made by the other four teachers, and excerpts of their explanations are provided:

Tr. 5: Yea, I can only explain the learner interest ... some learners are interested in calculations, others in creative arts and others in sporting activities. Yea, that's it!

Tr. 8: The pupils might be interested in reading, writing, singing, dancing drawing and other activities. Each of them likes to do something.

Tr. 9: [hhmmmmmm...] I know that some of these pupils learn for example through class participation while others learn better with their friends and as such groupings will help them. That's what I can say.

Tr. 11: Actually, what I know is that some of the pupils learn on their own while others 'chew and pour'.

The teachers seemed to possess an average level knowledge on differentiation based on *learning environment* (Table 2). Per the total sample population, the *learning environment* concept recorded a mean (15.78, $SD = 5.60$) projecting it around the *AM* (17.56). Details of the items assessing teachers' knowledge of differentiation based on learning environment are presented in Table 7.

Table 7:

Teachers' Knowledge of Differentiation based on Learning Environment.

| Environment | <i>M</i> | <i>SD</i> |
|--|-----------------|------------------|
| Classroom environment should be structured to support a variety of activities like flexible grouping or individual work | 4.40 | 0.76 |
| Materials should be varied to satisfy pupils' interest/abilities | 3.96 | 1.18 |
| Learning environment should favour every learner | 4.62 | 4.67 |
| Normal classroom environment should include special children or pupils with disability (physical, emotional, mental etc) | 2.80 | 1.51 |

From Table 7, the means for the items ranged from 2.80 to 4.62 and the *SD* ranged from 0.76 to 4.67. The item which obtained the lowest mean (2.80, $SD = 1.51$) was on inclusivity of special children into the normal school setting, and the highest mean (4.62, $SD = 4.67$) was on whether learning environment should favour every learner.

This signifies a wider and a more dispersed data spread about the mean, implying that the teachers' knowledge on this item varied greatly.

A further enquiry on primary school teachers' knowledge of differentiation through learning environments revealed that all the teachers knew that classroom environment can be structured to support a variety of activities like flexible groupings or individual work. However, five of them taught that structuring classroom environment pertains only to the arrangement of classroom seats for grouping purposes. Meanwhile, 10 of the respondents could not explain how the classroom environment is varied to support activities. In another instance, all the participants disagreed that normal schools should include special children. They opined that it would not be helpful to both the special and the normal stream children since they both learn through different means. Majority of them also stated that teachers who teach in the normal schools do not have the requisite knowledge, skills and resources to teach special children.

The teachers' level of knowledge on differentiation of *lesson planning* with a mean (13.97, $SD = 2.78$) which is lower than the *AM* recorded a lower level of knowledge. Details of the items that assessed the teachers' knowledge of differentiation based on lesson planning are presented in Table 8.

Table 8:***Teachers' Knowledge of Differentiation based on Lesson Planning.***

| Items | <i>M</i> | <i>SD</i> |
|--|-----------------|------------------|
| Every pupil's needs must be considered when planning lessons | 3.42 | 1.56 |
| Lesson objectives should consider individual learner's needs | 3.74 | 1.16 |
| Lessons should be planned considering pupils' differences | 3.72 | 1.17 |
| The same lesson plan must satisfy all learners in the same class | 3.09 | 1.43 |

From Table 8, the means for the items ranged from 3.09 to 3.74 and the *SD* ranged from 1.16 to 1.56. The item which obtained the lowest mean (3.09, *SD* = 1.43) was on whether the same lesson plan must satisfy all learners in the same class, the highest mean (3.74, *SD* = 1.56) was on considering pupils when setting lesson objectives.

Out of the total interviewees, 10 confirmed knowing that each of their pupils' learning needs should be considered in planning lessons while 5 declined knowing about it. Among the 10 teachers who claimed to know, only three could tell why each pupil's needs should be considered in lesson planning. Tr. 7 and Tr. 12 opined that lesson planning should be differentiated in order to cater for the different varying needs of each learner while Tr. 5 affirmed that the need to cater for children's needs starts from lesson preparation. Tr. 4 who also knows of DI based on lesson planning reported that it is not feasible to consider every learner in lesson planning due to large number of pupils in the classroom.

The teachers seemed to possess a lower level of knowledge on *general basic theories* of differentiation (Table 2). Per the total sample population, the *general basic theories* of differentiation recorded a mean (13.92, *SD* = 3.53) projecting it far below the *AM*.

Details of the items assessing teachers' knowledge on general basic theories of differentiation are presented in Table 9.

Table 9:

Teachers' Knowledge on the General Concepts of Differentiation.

| Items | <i>M</i> | <i>SD</i> |
|---|-----------------|------------------|
| I know much about equity and accessibility for all learners | 4.45 | 1.02 |
| I have enough knowledge on Special Education | 3.48 | 1.16 |
| I have enough knowledge on Inclusive Education | 3.61 | 1.10 |
| I have enough knowledge on Differentiated Instruction | 3.39 | 1.16 |

The means for the items in Table 9 ranged from 3.39 to 4.45 and SD ranged from 1.02 to 1.16. The item which obtained the lowest mean (3.39, $SD = 1.16$) was on teachers' knowledge on the concept of differentiation of instruction, and the highest mean (3.61, $SD = 1.10$) was on teachers' knowledge on the concept of Inclusive Education.

When the respondents' knowledge on the basic theories of differentiation were assessed, 10 of them (Tr. 2, Tr. 4, Tr.5, Tr. 8, Tr. 9, Tr. 10, Tr. 11, Tr. 12, Tr. 13, Tr. 14, and Tr. 15) had basic knowledge of inclusive education while the remaining 5 (Tr. 1, Tr. 3, Tr. 6, Tr. 7 and Tr.12) admitted having no knowledge on it. Four out of the 10 teachers who agreed to have knowledge on inclusivity could not explain what it meant. Six of them basically explained it as captured in the following excerpts:

Tr. 4: Special education is the combination of pupils with disabilities and normal children into the main school stream.

Tr. 5: [mmmmmm ...] I've forgotten. Ok let me try. Is it not when all pupils; higher and lower achievers are included in the normal school stream?

Tr. 8: Oh, I learnt it in college long ago but I have forgotten what it is. Is it not adding special pupils to normal children in the same schools?

Tr. 9: Inclusive education, inclusive education, is it not special children in the normal school? ... I've heard it but I'm not sure if that's correct.

Tr. 10: When those with disabilities; thus every individual irrespective of their abilities or disabilities are combined in the same educational system

Tr. 11: That is combining the special and normal children, isn't it?

Moreover, all the respondents except Tr. 1 claimed to have knowledge on special education. With respect to that, 7 teachers (Tr. 2, Tr. 3, Tr. 5, Tr. 8, Tr. 9, Tr. 11, Tr. 14) explained it basically as taking care of special children while three (Tr. 4, Tr. 13 and Tr. 15) see it as an education for special children with special needs. The explanations given by the other four teachers on special education have been presented in the below excerpts:

Tr. 6: It is when you give special attention to special children.

Tr. 7: I think it is the type of education given to the physically and mentally challenged children.

Tr. 10: [Eeeeeeeerrrrmm] let me give you a layman's view on it. It is when pupils with disabilities are given special education at a particular place.

Tr. 12: Helping the disabled children to acquire some knowledge.

However, none of the respondents could explain Differentiation of Instruction.

Further probes revealed that they learnt about these concepts theoretically during pre-service training for examination purposes and forgot about them afterwards. For example, Tr. 10 had this to say:

Tr. 10:[hhhhmmmm...] I learnt something little about some of these things you are asking me in college but I've forgotten about it.

Interviewer: Why did you forget about it?

Tr. 10:[ooohhhhhh....] you know most of the things we learn in college are 'chew-pour-pass-and-forget'. It's easy to forget them after exams.

Two of the respondents reported to have acquired their knowledge in the DI concepts and phenomena through their daily teaching exposures and experiences. All the teachers reported that they have not heard about differentiation of instruction before.

The teachers' level of knowledge on differentiation through *content* with a mean (12.47 and $SD = 2.30$) which is also far lower than the *AM* recorded a lower level of knowledge. Details of the items that assessed the teachers' knowledge of content differentiation are presented in Table 10.

Table 10:

Primary School Teachers' knowledge of Differentiation based on Content.

| Items | <i>M</i> | <i>SD</i> |
|--|-----------------|------------------|
| Content can be varied for pupils in the same classroom | 3.02 | 1.38 |
| Specifically, contents can be reduced for pupils with learning difficulties and upgraded for gifted learners (in the same class) | 3.18 | 1.48 |
| All learners in the same classroom must learn the same content no matter their learning differences or learning needs | 3.12 | 1.47 |
| Content must satisfy the curriculum needs or examination requirements instead of individual pupil's needs | 3.15 | 1.49 |

The means for the items on content differentiation (Table 10) ranged from 3.02 to 3.18 and SD ranged from 1.38 to 1.49. The item which obtained the lowest mean (3.02, $SD = 1.38$) was on the necessity of varying lesson contents for pupils in the same classroom, and the highest mean (3.18, $SD = 1.48$) was on varying content for challenged and gifted learners.

Results of the study again revealed that, 6 out of the 15 participants (Tr. 2, Tr. 6, Tr. 8, Tr. 9, Tr. 10 and Tr. 12) knew that lesson contents can be differentiated for learners in the same classroom while the remaining 9 did not know. All the six unanimously stated that since learners have different learning abilities, contents can be varied in order to motivate every pupil to understand the lesson so that they can all benefit from it. Tr. 12, for instance, had this to say:

Since pupils' learning abilities are not the same; they shouldn't always learn the same thing. By the end of the day every child is supposed to benefit from the lesson. Do you know that the high achievers get bored when the content is way below their knowledge level? [...] The same thing happens to the low achievers when contents are too difficult for them. So contents can be varied so that they will all benefit. In fact, it even motivates and encourages all of them to learn.

The teachers' level of knowledge on differentiation through *learning styles* with a mean (11.02, $SD = 2.56$) which is the farthest from the *AM* recorded the lowest level of knowledge. Details of the items that assessed the teachers' knowledge of differentiation through learning styles are presented in Table 11.

Table 11:***Teachers' Knowledge of Differentiation based on Learning Style.***

| Items | <i>M</i> | <i>SD</i> |
|--|-----------------|------------------|
| Every pupil in the classroom has his/her learning style | 3.96 | 0.93 |
| Each learner learns through a particular learning style | 3.63 | 1.03 |
| Every pupil's learning disabilities and abilities must be addressed through his/her learning style when teaching | 3.43 | 1.22 |

The means for the items on differentiation through learning style (Table 11) ranged from 3.43 to 3.96 and SD ranged from 0.93 to 1.22. The item which obtained the lowest mean (3.43, $SD = 1.22$) was on how learners' learning styles are addressed, and the highest mean (3.96, $SD = 0.93$) was on the learning style of individual pupils.

The findings of the study further revealed that a majority of 10 teachers (Tr. 1, Tr. 2, Tr. 3, Tr. 4, Tr. 5, Tr. 6, Tr. 7, Tr. 13, Tr. 14 and Tr. 15) had no idea about the learning styles of pupils. Out of the other 5 respondents who claimed to know, one (Tr. 8) could not explain, three (Tr. 9, Tr. 10 and Tr. 11) briefly explained pupils' learning styles by stating that some pupils learn best by themselves or on their own, others learn when their friends teach them while some learn best when they are engaged in group work. The explanation of learning styles provided by one of the teacher has been captured:

Tr. 12: What I know is that students' learning styles entails that, some students learn by listening, others by role-playing and others through visuals.

4.3.2 Primary School Teachers' Pedagogical Practices of Differentiated Instruction

Research Question 2: What are Kwabre East primary school teachers' pedagogical practices of Differentiated Instruction?

The question sought to ascertain the pedagogical practices of primary school teachers' practices of DI. The teachers' observed practices were organised into frequency counts and then converted into percentages. The results of the analysis are presented in Table 12.

Table 12:

Primary School Teachers' Pedagogical Practices of Differentiated Instruction.

| No | Items | Scarcely % (f) | Little % (f) | Often % (f) | Steady % (f) |
|----|---|-------------------|--------------------|----------------|-----------------|
| 9 | Materials/resources supports the standards and topics | 26.7 (4) | 40.0 (6) | 33.3 (5) | 0 (0) |
| 10 | Materials/resources are age appropriate | 26.7 (4) | 40.0 (6) | 33.3 (5) | 0 (0) |
| 11 | Materials/resources are available in adequate number for the class size | 93.3 (14) | 6.7 (1) | 0 (0) | |
| 12 | Materials/resources include appropriate reference sources and materials | 40.0 (6) | 6.7 (1) | 53.3 (8) | 0 (0) |
| 13 | Teacher uses a variety of materials other than the standard textbooks | 20.0 (3) | 20.0 (3) | 60.0 (9) | 0 (0) |
| 14 | Teacher differentiates using major concepts | 73.3 (11) | 26.7 (4) | 0 (0) | 0 (0) |
| 15 | Teacher works with total groups, individuals and small groups | 60.0 (9) | 20.0 (3) | 20.0 (3) | 0 (0) |
| 16 | Teacher monitors individual and small groups | 73.3 (11) | 6.7 (1) | 20.0 (3) | 0 (0) |
| 17 | Teacher applies assessment information to guide instruction | 6.7 (1) | 33.3 (5) | 60.0 (9) | 0 (0) |
| 18 | Teacher provides time for students to | 0 (0) | 0 (0) | 13.3 (2) | 86.7(13) |

| | | | | | | |
|---------|---|-----------|-----------|----------|-----------|---|
| | actively process information | | | | |) |
| 19 | Teacher gives specific feedback to individual and/or small groups | 0 (0) | 0 (0) | 26.7 (2) | 73.3 (11) |) |
| Q2 0 | Teacher meets the diverse needs of learners | 66.7 (10) | 20.0 (3) | 13.3 (2) | 0 (0) |) |
| Q2 1 | Teacher uses a variety of instructional strategies and activities to teach standard | | 66.7 (10) | 33.3 (5) | 0 (0) |) |

The percentage of responses on the participants' pedagogical practices ranged from 6.7% to 93.3%. The item with the highest score 93.3% (14) indicated that materials/resources were adequate for the class size, while several categories scored 6.7%. Table 12 shows that 26.7% (4) scarcely used materials/resources that support the standards and topics taught (Item 9), 40.0% (6) showed little evidence and 33.3% (5) often used materials. The participants (26.7%, 4) scarcely used materials that were age appropriate (item10). 40.0% (6) and 33.3% (5) used little and often used materials respectively. For item 11, 93.3% (14) indicated that the materials were scarcely adequate for the class size while 6.7% (1) had little evidence. While 40.0% (6) of the teachers scarcely used a variety of materials other than the standard textbooks, 20.0% (3) and 60.0% (9) used little and often used such materials respectively.

For item 14, 73.3% (11) of the teachers scarcely differentiated instruction using major concepts, with the remaining 26.7% (4) showing little evidence to that effect. Sixty percent (60.0%, 9), 20.0% (3) and 20.0% (3) of the teachers scarcely, sometimes and often worked with all groups of learners during teaching respectively. About 73.3% (11) of the teachers scarcely monitored individual and small groups while 20.0% (3) often did so and 6.7% (1) showed little evidence of monitoring individual and small groups. A good percentage (60.0%, 9) of the teachers often applied assessment

information to guide instruction, though 33.3% (5) showed little evidence to that effect. It is significant to note that 86.7% (13) steadily gave time for students to actively process information (Item 18) and 73.3% (11) steadily gave specific feedback to learners (Item 19). It is however discouraging to note that 66.7% (10) of the teachers scarcely met the diverse needs of learners. Only 20.0% (3) showed little evidence of this component. About 66.7% (10) of teachers showed little evidence of varying instructional strategies/activities during teaching as 33.3% (5) often did so.

These results suggest how poorly teachers used instructional materials in terms of age appropriateness, availability and quantity. A typical scenario to this is that all the teachers failed to make available relevant instructional materials to their learners during instruction. The interview results further proved that the teachers did not display students' works and artefacts, pictures and other teaching/learning materials in the classrooms. The main reasons they gave for this situation included non-availability of these materials and unsecured classrooms that exposed those materials to destruction by intruders even when they were available.

The results generally indicated that the teachers averagely varied teaching strategies and appropriately gave feedback to their learner. Moreover, some of the teachers employed good pedagogical practices in their instructions after showing higher level of knowledge on process differentiation. For instance, the interview results showed that all the teachers knew about the use of group work and problem-solving activities as effective methods of teaching. Also, almost all the teachers (14) confirmed using group work in their classrooms during instructions. However, the frequency of their groupings varied among the teachers. Its use varied from daily to once a term. Six of the teachers reported that they use group work once a term while three use it once a

week. Only one teacher reported that he/she uses it every day in instruction. The one who disagreed to the use of group work gave the reasons in the following excerpts:

Interviewer: Do you engage your students in group work?

Tr. 4: Not at all, I have never done that.

Interviewer: Why?

Tr. 4: Because I teach ICT and it is purely teacher-centred in my school.

Interviewer: Why is it so? Don't you let your pupils practice during teaching?

Tr. 4: No... There are no computers for that, I just teach them theoretically. I talk while they listen, and when I have a material to show to them, then I do it. That's all.

Seven teachers (Tr. 7, Tr. 8, Tr. 9, Tr. 12, Tr. 13, Tr. 14 and Tr. 15) do not engage their pupils in problem solving activities while 8 confirmed doing so. One of the latter employed project/problem solving activities once a term. Five did so once a month while two use it daily. The reason all the teachers gave for employing project work was based on fulfilling of a requirement in the New School Based Assessment.

The results further revealed that the teachers scarcely differentiate instruction based on the major concepts of differentiation such as learner interest, lesson planning, content, learning styles, etc and scarcely teach to meet the diverse learning needs of individual learners. They teach to the middle. Results from the interview data further revealed that while 8 teachers teach to satisfy the teaching syllabus, 4 teach to satisfy learners' learning needs and 3 teach to satisfy both. The teachers who teach to satisfy the syllabus requirement opined that teaching to the syllabus is what is expected of them and that examination is based on the syllabus. For example, Tr. 1 said that:

I teach to satisfy the syllabus requirements whether it's good or not because that is what is required of me. Perhaps that's what can make them pass their exam. And my work will be measured by their passing of these exams or otherwise. Isn't it?

The reasons of the three teachers who teach to satisfy both learners' needs and the syllabus requirements have been captured in the following excerpts:

Tr. 2: I follow the syllabus alright but I make sure that majority of my pupils understand the lesson, before I move on to the next aspect of the syllabus. I think that's what's important.

Tr. 9: You know, every teacher wants to teach to satisfy her learners but sometimes due to time factor we forget about them and concentrate on what the syllabus requires of us. But the pupils have to understand, so I try my best to teach in a way that will make them understand better.

Tr. 12: I work with the syllabus, it guides me but I satisfy my pupils' learning needs too.

The four teachers who purported to satisfy pupils' learning needs instead of the syllabus have their reasons captured in the following excerpts:

Tr. 6: I teach to satisfy my pupils' learning needs because the syllabus is sometimes impracticable. It is sometimes higher or lower than the level of pupils so I adjust it to suit them.

Tr. 7: I try to satisfy my pupils' needs, but not all of them: I satisfy those who would understand.

Tr. 10: Oh, what's the use to finish the syllabus if your pupils don't understand your lessons? Because the main motive for teaching is for pupils to understand what was taught.

Tr. 11: I believe in what pupils acquire more than what the syllabus requires. If they know something, it is better than finishing the syllabus.

Teachers pedagogical practices of differentiation based on learners' interest were also inquired. Ten teachers declined considering every pupil's interests, cultures and expectations during lesson delivery. Seven of them (Tr. 1 Tr. 2, Tr. 3, Tr. 4, Tr. 13, Tr. 14 and Tr. 15) did not give any reason for not considering these learner attributes. However, the rest (Tr. 5 Tr. 6 and Tr. 7) gave reasons for their declinations as time factor vis-avis the pressure on their school time tables. Five teachers on the other hand admitted considering every pupil's learning interests, cultures and expectations during lesson delivery. However, two of the later (Tr. 9 and Tr. 10) could not explain how they do this during instructions. The rest provided the means of doing so as follows:

Tr. 8: I let my pupils do what they like to do best during teaching and learning. That's how I do it.

Tr. 11: How I do that? Sometimes I teach some of them alone; one-on-one, and I also allow them to do what they like best as learners.

Tr. 12: I do this by encouraging them to look for things on their own.

A further enquiry into teachers practices of differentiation through *lesson planning* revealed that only 5 teachers considered each of their pupil's learning needs during lesson preparations. Two out of the five could not give reasons for doing so while the other three cited that they did so to pre-plan for the diverse learning needs of all

learners before lesson delivery. The other remaining 10 teachers did not consider learners' learning needs during lesson planning for the reason that it was not part of their job expectations. They also complained of insufficient time and the tendency of catering for pupils learning needs complicating their work. When teachers were asked if they consult a variety of materials aside the standard textbooks when planning lessons, two reported in the disagreement with the reason of non-availability of such materials. All the remaining 13 teachers who affirmed doing so mentioned privately-written textbooks as examples. The most common sources included textbooks written and sold in the market to basic schools students and teachers such as Badu Nkansah Series, Aki Ola Series and Golden English Series among others. Most of them also searched the internet for information.

On teachers' practices of content differentiation, six teachers (Tr. 2, Tr. 6, Tr. 8, Tr. 9, Tr. 10 and Tr. 12) varied content to suit learners' levels. Thus, they simplified contents for pupils with learning difficulties and upgraded it for gifted/talented learners. They posited that they did this in order to help and motivate every learner in the classroom to learn and enjoy learning. The other 9 teachers do not vary the lesson contents to suit the needs of their pupils. The reason some of the teachers (Tr. 1, Tr. 3, Tr. 7, Tr. 13, Tr. 14 and Tr. 15) gave was that, pupils should be taught the same content since they would write examinations based on the same content. Responses of the remaining three teachers have been captured in the following excerpts:

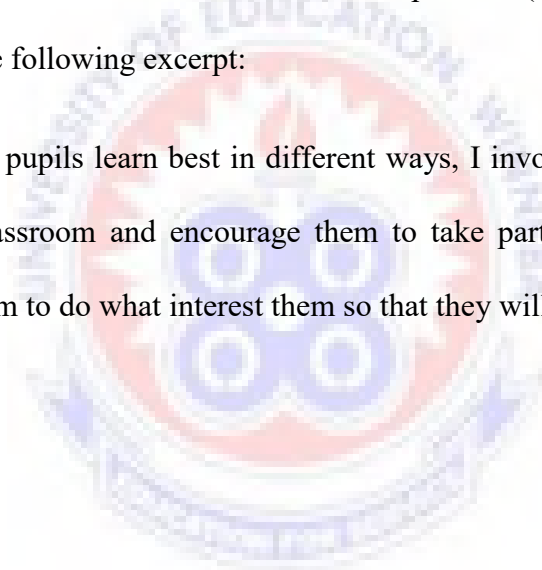
Tr. 4: I don't, so that all my pupils can move at the same pace.

Tr. 5: I don't even have gifted learners in my class. I have only one high achiever but I don't even upgrade content for him due to time factor.

Tr. 11: I don't vary content for my learners. I have no reason; I try for all of them to understand the same content. They are at the same level so they should be taught the same thing. They'll even write the same exams based on the same content.

Enquiry on primary school teachers' practices of differentiation through learning styles revealed that, 13 teachers do not address pupils' learning abilities and disabilities through pupils' learning styles. One of the 2 remaining teachers (Tr. 9) who asserted addressing learning needs through learners' learning styles could not explain how he does that. However, the other respondent (Tr. 12) provided the means of doing so in the following excerpt:

Since the pupils learn best in different ways, I involve them in whatever I do in the classroom and encourage them to take part in the instruction. I also allow them to do what interest them so that they will be motivated to do more.



4.3.3 Primary School Teachers' Assessment Practices of Differentiated Instruction

Research Question 3: What are Kwabre East District primary school teachers' assessment practices of Differentiated Instruction?

The research question three sought to find out primary school teachers' assessment practices of DI. The frequency counts on the teachers' use of assessment practices of DI were converted into percentages. Table 13 presents the results of the analysis.

Table 13:

Primary School Teachers' Assessment Practices of Differentiated Instruction.

| No | Items | Scarcely | Little | Often | Steady |
|----|---|-----------|----------|----------|-----------|
| | | % (f) | % (f) | % (f) | % (f) |
| 22 | Teacher uses variety of assessment tools before, during and after learning | 0 (0) | 26.7 (4) | 33.3 (5) | 40.0 (6) |
| 23 | Teacher provides opportunities for student products to be based upon the solving of real life and relevant problems | 66.7 (10) | 33.3 (5) | 0 (0) | 0 (0) |
| 24 | Teacher allows for a wide range of product alternatives (oral, creative, visual etc) | 80.0 (12) | 0 (0) | 20.0 (3) | 0 (0) |
| 25 | Assignments necessitates that students conduct research | 100 (15) | 0 (0) | 0 (0) | 0 (0) |
| 26 | Teacher works with individual students or groups to determine the form of product | 93.3 (14) | 6.7 (1) | 0 (0) | 0 (0) |
| 27 | Teacher uses both formative and summative evaluation | 0 (0) | 0 (0) | 6.7 (1) | 93.3 (14) |

Table 13 indicates that 26.7% (4) of the teachers showed little evidence of using a variety of assessment tools before, during and after learning (Item 22) while 33.3% (4) and 40.0% (6) often and steadily did so respectively. About 66.7% (10) of the teachers scarcely provided opportunities for students' products to be based upon solving real life and relevant problems while the remaining 33.3% (5) exhibited little

evidence to that effect. A majority of the teachers (80.0%, 12) scarcely allowed their pupils to work on a wide range of product alternatives while 20.0% (3) often did so. All the participants (100%, 15) scarcely provided assignments that necessitated students' to conduct research. This suggests a very poor employment of research oriented exercises in the primary school classrooms. About 93.3% (14) scarcely worked with individual students or groups to determine the form of product while 6.7% (1) showed little evidence to that effect. Majority of the teachers (93.3%, 14) steadily used formative and summative evaluation while 6.7% (1) often used them during teaching. This shows that the teachers' assessment practices during classroom instruction delivery were very good.

The results indicated that majority of the teachers regularly used either formative or summative evaluation and a variety of assessment tools before, during and after learning. Accordingly, the interview schedule revealed that all the respondents agreed to the need to employ a variety of assessment tools and strategies before, during and after lesson delivery; as well as the need to apply assessment information to guide instruction.

Beside this, none of the teachers provided opportunities for students' products to be based upon solving real and relevant problems and almost none of them provided research necessitated assignments to learners. Moreover, almost none of the teachers provided learners with assessment opportunities that allowed for a wide range of product alternatives. This was manifested in the interview results when the teachers were further probed with regards to that. Apart from Tr. 2 who claimed to provide a variety of assessment tasks for pupils to choose from, all the other teachers do not do so. Upon further probe on how Tr. 2 does that, he reported that he provides a variety

of theory questions for pupils to choose from during class tests. Some of the other 14 respondents who failed to vary assessment options gave similar reason that pupils should work on the same assessment task since they learn and would be examined on the same content. For example, Tr. 1 Tr. 6 and Tr. 9 gave the following responses:

Tr. 1: I think they should work on the same task since that's what the system demands. We all work per the curriculum requirements and we can't treat these children differently in that respect. If we do that to them... they will find themselves wanting in future examinations.

Tr. 6: Since they learn the same content, they should be evaluated on the same thing. Period!

Tr. 9: I think that since they are in the same class, learn the same thing and write the same exams at the long run; they should work on the same assessment tasks.

The responses of the two remaining teachers have been captured in the following excerpts:

Tr.10: I always give them the same assessment tasks to know if they have all been able to grasp what I taught them.

Tr. 11: Well, assessment and evaluation are based on lesson objectives; and since the objectives are the same, they should work on the same tasks.

4.3.4 Primary School Environmental Support of Differentiated Instruction

Research question 4: How supportive are Kwabre East District primary school learning environments of Differentiated Instruction?

This research question sought to find out how primary school learning environments supported DI. A checklist was used to assess the quality of the classroom environments with respect to their support of DI. The assessment was done in 15 classrooms with an observational checklist. The following criteria were used to assess the quality and features of the classroom environment that supported DI. Poor = 1, Satisfactory = 2, Needs Improvement = 3, Good = 4 and Excellent = 5.

The weightings of the observed environmental features were added up and their percentages were determined. The results have been presented in table 14:

Table 14:

Primary School Learning Environments' Support of Differentiated Instruction.

| No | Items | Poor | | Sat. | | NI | Good | | Exc. |
|----|---|------|------|------|------|-------------|------|-----|-------------|
| | | % | (f) | % | (f) | % (f) | % | (f) | % (f) |
| 1 | Presents an inviting, relaxed environment for learning | 13.3 | (2) | 40.0 | (6) | 13.3 (2) | 20.0 | (3) | 13.3 (2) |
| 2 | Provides comfortable desks and work areas | 33.3 | (5) | 46.7 | (7) | 20.0 (2) | 0 | (0) | 0 (0) |
| 3 | Is designed for quick and easy groupings of tables and chairs | 33.3 | (5) | 66.7 | (10) | 0 (0) | 0 | (0) | 0 (0) |
| 4 | Is arranged for teacher and student movement | 20.0 | (3) | 53.3 | (8) | 6.7 | (1) | 0 | (0) (2) |
| 5 | Provides work areas for individual needs including knowledge/ability levels and inclusion of special children | 33.3 | (5) | 33.3 | (5) | 6.7 (1) | 26.7 | (4) | 0 (0) |
| 6 | Reflect current content or skill through student displays and artefacts | 86.7 | (13) | 6.7 | (1) | 0 (0) | 6.7 | (1) | 0 (0) |
| 7 | Is a place where students feel respected and emotionally safe | 0 | (0) | 0 | (0) | 13.3 (2) | 40.0 | (6) | 46.7 (7) |
| 8 | Class is sizeable enough to be managed expectedly by the teacher | 60.0 | (9) | 26.7 | (4) | 13.3 (2) | 0 | (0) | 0 (0) |

Poor = Poor, Sat = Satisfactory, NI = Needs Improvement, Good = Good, Exc. = Excellent

Table 14 indicates how supportive primary school classroom environments are of DI. Only 2 of the classrooms provided excellent classroom environment in terms of inviting and relaxed atmosphere for learning while 40.0% (6) were satisfactory and 20.0% (3) were good in that regard. About 33.3% (5) of the classroom environments were poor in providing comfortable desks and work areas for pupils, 46.7% (7) were satisfactory while 20.0% (3) needed improvement to that effect. About 33.3% (5) of the desks in the classrooms were poorly designed for quick and easy groupings while 66.7% (10) were satisfactory. About 20.0% (3), 53.3% (8) and 20.0% (3) of the classroom desks were poorly, satisfactorily and excellently arranged for teacher and student movement respectively.

The quality of the work areas provided by the classrooms for individual needs varied from poor (33.3%, 5), satisfactory (33.3%, 5) to good (26.7%, 4). Majority of the classroom environments (86.7%, 13) were poor in reflecting current content or skill through student displays and artefacts. About 40.0% (6) of the classrooms provided good environments where students felt respected and emotionally safe while, 46.7% (7) were excellent. More than half of the classrooms (60.0%, 9) were sizeably poor to be managed expectedly by the teachers and 26.7% (4) were satisfactory to that effect.

The results suggest that the quality primary school classroom environments varied with majority of the classroom being poor. Again, majority of the classroom environments were poor in reflecting current content or skill through student displays and artefacts. This was also ascertained in the interview results when none of the teachers disagreed to display students' works and artefacts, pictures and other

instructional materials on the classroom walls. The main reasons they gave for this situation include non-availability of these materials and unsecured classrooms that exposed those materials to destruction by intruders even when they were available. Learning desks in the classrooms were generally satisfactory but were not adjustable for varied classroom activities. Although students' population in the classrooms were large, about a quarter of the classrooms provided learners with an environment in which they felt respected and emotionally safe during instruction.

In another development, when the respondents were asked if they structure their classroom environments to suit all their learners including special children in their classrooms, all of them (with the exception of Tr. 8 who actually have a mentally challenged child in his/her classroom) reported that they have no special children in their classrooms. Again, all of them except Tr. 11 reported not doing so and went further to state that they were not in support of including special children into the normal school stream. Three of the 14 teachers (Tr. 3, Tr. 5 and Tr. 12) posited that the inclusion of special children will disturb and thwart the learning progress of their 'normal' counterparts. The other 11 teachers also opined that they did not possess the necessary knowledge, skills and expertise that are needed to teach special children and as such, do not support entertaining such learners in their classrooms. The responses of Tr. 8 and Tr. 10 for instance are captured in the following excerpts:

Tr. 8: Well, those special children are equally important but they should not even be part of these children because we the teachers are not trained to teach special children ... [hhhhmmm] I have one special child in my class; he disturbs the whole class the whole day. Most often I can't handle him.

Tr. 10: Well, I don't think I have any idea about how to structure my classroom environment for those children and I don't even know how I'll contain them... They might even be teased by the normal children.

CHAPTER FIVE

DISCUSSIONS

5.0 Overview

This chapter discusses findings obtained from the study on primary school teachers' knowledge and practices of DI. The discussion is based on themes reflecting the research questions. These are:

1. Primary school teachers' knowledge of differentiated instruction.
2. Primary school teachers' pedagogical practices of differentiated instruction.
3. Primary school teachers' assessment practices of differentiated instruction.
4. Primary school classroom environments and differentiated instruction.

5.1 Primary School Teachers' Knowledge of Differentiated Instruction

According to the Merriam Webster Online Dictionary (2015 ed.), knowledge can be information, understanding or skills that one gets from experiences or education. It can also be a state of being aware of something. The knowledge teachers possess on anything proves to be the most critical factor in their effectiveness or otherwise in their professional endeavours. According to Kauchak and Eggen (2003), teaching has

historically been a profession in search of knowledge that could inform classroom practice. This affirms the assertion that the extent of teachers' knowledge of DI is consequential to its practice and implementing by them (Whipple, 2012). In effect, teachers who are in the best position to differentiate instruction in their classrooms operate from strong and growing knowledge base (Tomlinson & Imbeau, 2010). Moreover, the implementation of DI requires deep knowledge of its process, theoretical framework and ways through which the theory is translated into action (Franz, 2009). It is based on these underpinnings that the primary school teachers' knowledge was deemed necessary and however explored.

The primary school teachers' knowledge of DI was examined based on nine sub-concepts which include; learner diversity, learner interest, learning styles, lesson planning, content, process, product/assessment, environment and general ideologies of differentiation. The findings of this study (see Table 2) revealed that primary the school teachers are highly knowledgeable of differentiation based on process with $M = 32.90$ ($SD = 5.22$), product/assessment with $M = 22.13$ ($SD = 3.24$) and learner diversity with $M = 20.08$ and $SD = 3.40$. The teachers had average knowledge of differentiation based on learner interest with $M = 15.81$ ($SD = 2.32$) and learning environment with $M = 15.78$ ($SD = 5.60$). The other sub-concepts on which teachers proved to possess lower knowledge included lesson planning with $M = 13.97$ ($SD = 2.78$), general theories of differentiation with $M = 13.92$ ($SD = 3.53$), content with $M = 12.47$ ($SD = 2.30$) and learning styles with $M = 11.02$ ($SD = 2.56$). These findings suggest that there is a fair or good level of knowledge of DI among teachers in the Kwabre East primary schools.

The varying level of primary school teachers' knowledge of the nine DI sub-concepts is consistent with the findings of Whipple (2012) which revealed similar variations of teachers understanding among six DI sub-concepts or components. However, while teachers knowledge on *process*, *interest* and *product* differentiation were reported higher in the findings of this study, they appeared to be the three least understood sub-concepts in Whipple's study.

Contrasting several other studies (Hobson, 2008; Logan, 2008; Whipple, 2012; Woods, 2014) which indicated that teachers were knowledgeable of DI because they were given special education and training on it, this study found that the teachers were generally knowledgeable of DI but had no education or training on it. This was manifested when the researcher asked them how they acquired the knowledge they had on the DI concepts. Majority of them admitted that *"they learnt something little about it as an Introduction to Special Education course in their colleges"* while a few of them affirmed to have known about it through *"teaching experience"*. This is consistent with the findings of Abbati (2012) which revealed that the exceptionally high implementers of DI were evidenced by personal factors such as willingness to persevere and grow professionally, relatively long experience of teaching the same grade level or class, and solid classroom management skills. The finding of this study revealed that the teachers have not heard about differentiation of instruction before despite knowing about its concepts. This is in disparity with the findings of Valiande & Koutselini (2009) in which most of the teachers who participated in their research reported to have heard a lot about DI but did not really know what it meant. In their study, some of the teachers who purported to have used differentiation in the past did

not really differentiate their instruction but had the misconception they did so by using different teaching methods, materials and different teaching/ learning activities.

According to Corbett (2001), inclusive education and its pedagogy are effective when connected to the individual's learning style and how they can learn most effectively, as well as linking the individual's learning to the curriculum and learning tasks so that they can benefit greatly from learning. This means that employing DI in education and special education go hand in hand (Tedesco, 2008). This could imply that the knowledge the respondents have on DI might have originated from their knowledge on inclusive and/or special education. This was exhibited in the interactions with the teachers, when the source of their knowledge on the subject was inquired during the interview. Majority of the teachers (86.7%, 13) revealed that they learnt about it in their special education course during their initial training in college. This is supported by the following excerpts:

Tr. 10:[hhhhmmmm...] I learnt something little about some of these things you are asking me in college but I've forgotten about them.

Interviewer: why did you forget about them?

Tr. 10:[ooohhhhhh....] you know most of the things we learn in college are 'chew-pour-pass-and-forget'. It's easy to forget them after exams.

It is important to note that the professional knowledge teachers possess makes them highly effective or otherwise and do make an impact on their learners in the classroom. The most effective pedagogical practices might even be worthless if the teacher who would employ them lacks the knowledge and skills to do so. Tomlinson and Imbeau (2010) assert that, the classroom teacher is the one responsible for moving differentiation from an abstract idea to a fundamental way of life in the

classroom. Accordingly, the extent to which teachers know of and understand DI is consequential to its implementation and practice (Whipple, 2012). As such, the gap between teachers' understanding and knowledge of DI pari passu its practices needs to be bridged (Whipple, 2012).

5.2 Primary School Teachers' Pedagogical Practices of DI

Studies reveal that the quality of teaching practices have strong effects on children's experiences of schooling, their attitudes, behaviours and learning outcomes (Darling-Hammond, 2005). This affirms the position of Kameenui and Carnine (1998) that instructional methods that do not accommodate the unique learning and curricular needs of diverse learners can expose them to greater risks of school failure. Also, traditional classroom approaches to teaching and learning such as one-size-fits-all have been proven to be ineffective means to instruction (Tomlinson et al., 2003).

Such highlights have necessitated a call for teachers to vary and adjust curriculum, materials and instructional support so that each learner can access high-quality learning (Shapiro; Gamoran & Weinstein; Schoenfeld cited in Tomlinson et al., 2003). And as such, a call by several researchers (Dorleku, 2013; Kuyini & Abosi, 2014; Sakyi, 2014; Carlson, 2014) to address the learning needs of the diverse learners in the Ghanaian basic school classrooms.

Results from the observation proved that the teachers barely differentiate instruction and scarcely use a variety of instructional strategies and activities in teaching standard. Again, teachers poorly used instructional materials in terms of age appropriateness, availability and quantity. Apart from poorly employing classroom

grouping during teaching, teachers scarcely teach to meet the diverse needs of learners. The findings suggest that there is a lower level of teachers' implementation and practices of DI despite their knowledge of it. These findings contradict the calls that prompt teachers on the need to address learner variance, difference and diversity in the regular classroom (Jackson & Davis cited in Rose & Dyer, 2008), as well as Ampiah's (2008) appeal teachers to adopt quality and evidence-based teaching practices that are effective in maximising the learning needs of all learners in Ghanaian basic school classrooms.

The teachers' refusal suggests that they might have known about DI but did not or did not want to employ it due to circumstances such as time, feasibility, complexity, examination pressures and curriculum demands among others. This was manifested in some of the responses of the interviewees, exemplified in the following excerpts:

Tr. 9: You know, every teacher wants to teach to satisfy her learners but sometimes due to time factor we forget about them and concentrate on what the syllabus requires of us. But the pupils have to understand.

Tr. 1: I teach to satisfy the syllabus requirements whether it's good or not because that is what is required of me, perhaps that's what can make them pass their exam. And my work will be measured by their passing of these exams or otherwise. Isn't it?

This is in agreement with the findings of Logan's (2008) study in which the teachers were knowledgeable of DI but refused to employ it for the argument of its feasibility, difficulty, complexity, examination pressures and curriculum demands.

The results also indicated that the teachers showed evidence of varying instructional strategies/activities during instruction (Table 12). This suggests that there were traces of good pedagogical practices in the teachers' instructional processes. It might be argued that the teachers might have not really or practically known about DI and its implementation but were simply implementing good pedagogical practices that did not necessarily originate from DI. This was also exhibited in the interview as shown in the following excerpts:

Tr. 2: I follow the syllabus alright but I make sure that majority of my pupils understand the lesson, before I move on to the next aspect of the syllabus. I think that's what's important.

Tr. 9: You know, every teacher wants to teach to satisfy her learners but sometimes due to time factor we forget about them and concentrate on what the syllabus requires of us. But the pupils have to understand, so I try my best to teach in a way that will make them understand better.

This is similar to the findings of a study conducted by Hobson (2008) which revealed that several teachers in the study were not actually following models of differentiation but were simply implementing best pedagogical practices. This again confirms Koeze's (2007) research findings in which the teachers who did not have training on DI implemented good pedagogical practices sporadically and unintentionally used differentiation variables that did not necessarily originate from DI.

Results of the study further indicate that there are variations in the levels of teachers' knowledge of DI. It was noticed that some of the teachers were highly knowledgeable of DI; some were averagely knowledgeable of it while others had little knowledge of

DI. These variations in teachers' knowledge were similarly observed in their practices. For instance, the results of the observation revealed that while some of the teachers regularly varied strategies/activities, majority of them showed little evidence of doing so for their pupils. These disparities in the knowledge and use of DI strategies imply that there may be vastly different types of teaching and learning occurring within the same district under different teachers. For example, while 50% of the interviewees highlighted the need to vary contents for their learners and the means through which they do so, the other half argued that it was not viable and necessary to do so. The teachers in support of content variation reiterated that they did so by simplifying contents for pupils with learning difficulties and upgrading it for gifted learners in order to help and motivate every learner in the classroom to learn and enjoy learning. The other half who disagreed to the variation of content for their learners did so because they think learners are the same and would write the same examinations based on the same content as explained by Tr. 11 in the following excerpt:

I don't vary content for my learners. I have no reason; I try for all of them to understand the same content. They are at the same level so they should be taught the same thing. They'll even write the same exams based on the same content.

These findings are consistent with that of Hobson's (2008) which revealed disparities in the use of DI strategies by teachers of Wrightsville Middle School, USA. Hobson found that there were different types of teaching and learning happening in the same school under different teachers though none of them had training on differentiation. A typical instance in this study is that while 8 of the interviewees reported to teach to satisfy the teaching syllabus, 4 teach to satisfy learners' learning needs and 3 teach to

satisfy both; and these variations were revealed by different teachers teaching in the same Kwabre East District. For example, the teachers who teach to satisfy the syllabus requirement opined that teaching to the syllabus is what is expected of them and that, examinations are based on the syllabus as captured in the following excerpt:

Tr.1: I teach to satisfy the syllabus requirements whether it's good or not because that is what is required of me. Perhaps that's what can make them pass their exam. And my work will be measured by their passing of these exams or otherwise. Isn't it?

These positions support the results of a survey conducted by Moon, Tomlinson & Callahan (1995) in which 50% of middle school teachers said they do not differentiate instruction based on readiness, interest or learning profile because they saw no need to do so. It also affirms claims made by Schumm and Vaughn cited in Durrett (2010) that most general educators feel ill prepared to teach to the diversities of learners' learning needs. This again confirms that many teachers feel that there is no time to cover anything except what the syllabus requires (Tomlinson & Doughty, 2005).

Some of the reasons given by the teachers who teach to satisfy both learners' needs and the syllabus requirements have also been captured in the following excerpts:

Tr. 2: I follow the syllabus alright but I make sure that majority of my pupils understand the lesson, before I move on to the next aspect of the syllabus. I think that's what's important.

Tr. 9: You know, every teacher wants to teach to satisfy her learners but sometimes due to time factor we forget about them and concentrate on

what the syllabus requires of us. But the pupils have to understand, so I try my best to teach in a way that will make them understand better.

The other four teachers who purported to satisfy pupils' learning needs instead of the syllabus have their reasons captured in the following excerpts:

Tr. 6: I teach to satisfy my pupils' learning needs because the syllabus is sometimes impracticable. It is sometimes higher or lower than the level of pupils so I adjust it to suit them.

Tr. 7: I try to satisfy my pupils' needs, but not all of them: I satisfy those who would understand.

Tr. 10: Ooh! What's the use to finish the syllabus if your pupils don't understand your lessons? Because the main motive for teaching is for pupils to understand what was taught.

Tr. 11: I believe in what pupils acquire more than what the syllabus requires. If they know something, it is better than finishing the syllabus.

The findings from the interview further revealed that none of the teachers has heard about differentiation of instruction despite the fact that some of them employed some practices of DI during instruction. This is in discordance with a study conducted by Valiande and Koutselini (2009) which reported that although teachers heard a lot about differentiation, none of them did really know how to practise differentiated instruction and most of them had serious misconceptions about DI. Their study further revealed that although DI is one of the main teaching approaches in the Cyprus curriculum, yet almost none of the teachers in their research practised differentiation of instruction in their classrooms and none of them received a substantial training on

differentiation. DI is not a suggested teaching approach in the Ghanaian educational curriculum, although the primary schools syllabi for the various subject areas suggest to teachers to teach to the needs of all category of their learners. However, there are instructional concepts and practices that are equivalent to differentiation which in effect account for the teachers' use of good instructional practices. Some of these practices include child centred approaches, inclusive education and education for all.

Confirming UNICEF-Ghana's (2013; 2014) report that the Ghanaian education system serves those who fit readily into it, excluding and ignoring those with special learning needs who do not easily do so in the set structure, and affirming that teachers in the Ghanaian education system do not effectively cater for the needs of pupils with learning difficulties in the regular classrooms (Dotse, 2012; Gyasi, 2011; Henne, 2013; Thomas, 2012; Kuyini & Abosi, 2014): The findings of this study disclosed that Kwabre East primary school teachers teach to the middle. The results generally indicated that they scarcely differentiate instruction and scarcely teach to meet the diverse learning needs of individual learners. This is also in agreement with studies conducted by Kuyini and Desai (2008), Kuyini and Abosi's (2011), Agbenyega and Deku (2011), Kuyini and Abosi (2014) which revealed teachers in Ghanaian basic schools' refusal to differentiate to cater for the diverse learning needs of different category of learners in their classrooms due to conditions such as large class size.

5.3 Primary School Teachers' Assessment Practices of DI

Assessment is one of the major components of differentiating instruction in the classroom (Whipple, 2012). There are several aspects of differentiating assessment which include pre-assessing before instruction, pre-assessing learners' readiness to

adjust lessons, providing formative and summative assessments and assessing learning styles (Tomlinson & Imbeau, 2010). Assessments can take several forms and should differ from learner to learner in order to allow every learner to exhibit what he/she has learnt (Tomlinson & Allan, 2000; Wormeli, 2007; Launder, 2011).

Differentiated assessment intends to measure what each learner produces as evidence of their learning (Gangi, 2011). It shows the learners' ability to apply what they have learned through a process (Heacox, 2002; Levy, 2008; Tomlinson & Allan, 2000; Wormeli, 2007). The products are usually how teachers establish if learners have learned and understood the content or not (Wormeli, 2007).

The results revealed a higher level of teachers' knowledge on differentiation of assessment (Table 2). The results from the interview also showed that majority of the teachers were generally knowledgeable of differentiated assessment. With regard to their practices, Table 13 indicated that all the teachers regularly use both formative or summative evaluation and a variety of assessment tools before, during and after learning. Beside this, none of the teachers provided opportunities for students' products to be based upon solving real and relevant problems and none of them allowed for a wide range of product alternatives. Again, almost none of them provided research necessitated assignments to learners. Although Kwabre East primary school teachers are highly knowledgeable of the fact that classroom assessment can be differentiated but their level of practices to that effect is quite low. This could mean that they are not prepared to differentiate assessment due to their own self beliefs or personal conception. For instance, almost all the teachers 93.3% (14) failed to vary assessment options for the reason that pupils should work on the same assessment task since they learn the same content and would be examined based

on the same content. These views are indicated by some of the teachers in the following excerpts:

Tr. 6: Since they learn the same content, they should be evaluated on the same thing.

Tr. 9: I think that since they are in the same class, learn the same thing and write the same exams at the long run; they should work on the same assessment tasks.

The findings are similar to the work of Hobson (2008) and those of Whipple (2012) in which teachers were highly knowledgeable of differentiated assessment but showcased the least level of its use or practice and implementation. Perhaps, demands of education such as examination pressure, high stakes testing, time constraints and curriculum requirements do not encourage them to differentiated assessment. This is illustrated in the following excerpt:

Tr. 1: I think they should work on the same task since that's what the system demands. We all work per the curriculum requirements and we can't treat these children differently in that respect. If we do that to them [...] they'll find themselves wanting in future examinations.

These findings are in contrast with that of Logan (2008) in which majority of teachers (73.0%) who participated in that study disagreed that DI does not prepare students to compete with the real world in terms of standardisation, expectations, testing and examinations. However, the only teacher reported to differentiate assessment for the learners limited it solely providing a variety of theory questions for pupils to choose from during classroom tests and examinations.

5.4 Primary School Environment Support of DI

Learning environment is another area through which instruction can be differentiated (Lauder, 2011). According to Tomlinson (2000), several elements in the classroom environment such as rules, procedures, furniture, available materials and mood can be differentiated. Consequently, the results in Table 5 indicated that majority of the general school and classroom environments did not present physical features that were conducive for learning or differentiation. Contrary to Lauder's (2011) assertions that a differentiated learning environment should be set up for differentiation by providing separate spaces for individual work and group instruction, majority of the classrooms observed in this study did not contain comfortable desks and work areas for individual needs and group instruction. Wormeli (2007) sees learning environment for DI as the physical space vis-avis the way it is arranged. However, almost all the desks in the classrooms under this study were poorly designed and were not designed for quick and easy groupings. The desks were also not favourable for arrangements that enhanced easy teacher and student movement. These are contrary to the assertion that differentiating the classroom environment should provide the students with a more inviting atmosphere to learn (Gangi, 2011). In another instance, the classrooms hardly reflected students' displays or artefacts. Again, the number of pupils contained in all the classrooms was too large to be managed expectedly by the teachers.

Wormeli (2007) projects an aspect within the differentiated learning environment which he terms as 'affect'. Wormeli defines affect as the social and emotional factors that influence learning. Similar to Wormeli's (2007) suggestion that, teachers should adjust to accommodate learners' learning needs by treating them in a way that they would feel safe, comfortable and willing to take risks in their learning in order to

differentiate for affect, the findings of this study shown that almost all the teachers who were observed provided environments in which students felt respected and emotionally safe.

Contrary to Launder's position that the differentiated classroom environment should entail physical features such as favourable furniture, materials, etc, the findings of this study indicate that majority of primary school learning environments were poor for differentiation. Majority of the classroom environments did not provide comfortable desks and work areas for individual needs; they were poorly designed for quick and easy groupings and were poorly arranged for teacher and student movement. This again is in discordance with Gangi's (2011) assertion that a differentiated classroom environment should provide a learner with a more inviting atmosphere to learn.

According to Gangi (2011), a differentiated classroom should be motivating and stimulating to learners by reflecting current content or skill through student displays and artefacts. It was observed in this study that Kwabre East primary school classrooms did not reflect students' display and artefacts, pictures and other instructional materials. The teachers attributed this to non-availability of the TLMs for pupils to produce the artefacts, and unsecured classrooms for artefacts developed by pupils and their exposure to destruction by intruders even when they were available.

Although researchers have not suggested a required number of learners that should be contained in a classroom for effective differentiation, Abbati (2012) asserts that a differentiated classroom should have convenient and manageable class size for DI. Findings of the study reveal that majority of the classes were too large and therefore not convenient for differentiation. Even though GES regulations suggest that pupil-

teacher ratio in a Ghanaian primary school classroom should be 35:1 (GES cited by Ghanaweb.com), the number of learners in each classroom ranged between 37 and 79. This situation might discourage teachers from taking care of each individual learner in their classrooms as reported by one of the teachers (Tr. 4). She asserted that differentiation in lesson planning was not feasible due to large number of pupils in his classroom. This agrees with findings of Abbati's (2012) study where teachers were discouraged by classroom conditions that existed in their schools and could not see it feasible to implement DI. According to Abbati, the teachers in her study were frustrated by large class size and the confusing ways that student learning groups were composed in their schools. This particular finding of the current study is also in concordance with that of Kuyini and Abosi (2014) in which large class size was found to have negative influence on teachers' ability to differentiate instruction. In their study, large class size deterred teachers from differentiating instruction, effectively controlling their class, gaining and sustaining pupils' interests and attention, effectively monitoring and assessing pupils' progress during instruction.

Contradictory to Tomlinson's (2000) position that differentiated classroom arrangements should be conducive enough to support any kind of differentiated activity such as flexible grouping, individualised learning, and peer teaching, among others, the findings of this study revealed that the classroom environments were not convenient for practices of differentiation. The classrooms were characterised by small spaces, overcrowding as well as poor seats and seating arrangements.

Tedesco (2008) affirms that DI is a method of teaching based upon the idea and need to accommodate inclusive education students within the general education classroom,

where all have their educational needs met along with the support of their peers. These are in contrast with how Kwabre East primary school teachers felt and acted towards inclusivity. The results revealed that majority of the teachers (93.3%, 14) were generally hesitant to create learning environments that could accommodate all learners no matter their deficiencies. This is manifested in the following excerpts:

Tr. 8: Well, those special children are equally important but they should not even be part of these children because we the teachers are not trained to teach special children ... [hhhhmmm] I have one special child in my class; he disturbs the whole class the whole day. Most often I can't handle him.

Tr. 10: Well, I don't think I have any idea about how to structure my classroom environment for those children and I don't even know how I'll contain them... They might even be teased by the normal children.

The positions of the teachers for not supporting inclusivity were justified by the fact that they did not have the requisite knowledge, skills and the expertise to cater for the demanding needs of the special children. This was further ascertained by what the only teacher (Tr. 11) who partially support inclusivity said during the interview:

Yea, though I don't have any in my class now, I support them anytime I happen to have one in my class. Some of these children can be included; the partial ones can be included. But the deaf and dumb, the blind and all other severely impaired should be taken to the special schools. Because they have a special way of learning that the normal teacher cannot teach. If we are given the necessary training we can also teach them here; but until then, we can only do little even for the partially impaired.

The later reiterates teachers' perceptions that when they are given the needed training, materials and motivation to that effect, they would do better. This supports the

recommendation made by Brennan (2008) that there is the need to put in place comprehensive, thoughtful plan for professional development of teachers on concepts like DI. Brennan further posits that it is through meeting the needs of teachers that will enable them to facilitate quality learning in the classroom.

It was deduced that all the teachers in this study considered special children only as children with the commonly known disabilities such as visual, hearing, locomotor and mental impairments. For instance, almost all the interviewees (with the exception of Tr. 8 who actually had a mentally challenged child in her classroom) disagreed to having special children in their classrooms. However, children with special needs extend beyond those who are included in those disability categories to cover every learner in the classroom who needs help to succeed (MoE, 2013). Some of these children include those with Attention Deficit Hyperactivity Disorder, children with emotional and behaviour disorders, the gifted and talented, children with a specific learning or subject disability, children from broken homes, child labourers, children living in extreme social and economic deprivations and the dyslectic among several others (MoE, 2013). This confirms an assertion made by SAP (2011) that children in Ghanaian basic schools who have difficulties in specific areas such as reading, writing, arithmetic and speaking etc are not formally recognised as children with special education needs and therefore no provisions are made to support them.

In sum, this study found that out Kwabre East primary school teachers are generally and variably knowledgeable of DI concepts. However, there was a lower level of the teachers' implementation and practices of DI despite their knowledge of it. Teachers scarcely differentiate instruction but employ several good instructional practices in their pedagogies. Again, the teachers poorly use instructional materials. It was also

found that the teachers did not differentiate assessment for their learners. Majority of the classroom environments were not conducive for differentiating instruction.



CHAPTER SIX

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

6.0 Overview

This study investigated primary school teachers' knowledge and practices of Differentiated Instruction. The study was conducted in the Kwabre East District in the Ashanti Region of Ghana. A mixed method approach was used to collect both quantitative and qualitative data. The Research instruments that were used to collect data for this work included questionnaire, observation and interview. The questionnaire was used to collect quantitative data while interview and observation were employed to collect qualitative data. The quantitative data was analysed using the SPSS version 20 where as the qualitative data was thematically analysed. Findings were presented concurrently with respect to the research questions stated.

6.1 Main Findings

The findings of the study revealed that:

1. Majority of primary school teachers possessed at least a fair knowledge on the major concept and practices of differentiation (even though they were not aware that those were concepts and practices DI). The primary school teachers' knowledge of the nine DI components varied. The level of the teachers' knowledge determined was in an ascending order as process, product/ assessment, learner diversity, learner interest, learning environment, lesson planning, general differentiation concepts, content and learning styles. There were disparities in the teachers' knowledge of DI. They were categorised as highly, averagely and lowly knowledgeable of DI.

2. Majority (93.3%) of the primary school teachers scarcely differentiated classroom instruction and scarcely taught to address the learning needs of their learners despite the knowledge they appeared to possess of DI.
3. It was also found that the of Kwabre East District primary school teachers scarcely differentiated assessment in their classrooms. The teachers failed to differentiate assessment to their learners deliberately or unintentionally.
4. Also, almost all the primary school learning environments were quite poor and needed improvement. None of the teachers provided learning environments that were conducive for differentiated instruction. Desks in the classrooms were poorly designed and poorly arranged for quick or easy groupings and individual needs. The classrooms hardly reflected pupils' current content, knowledge or skill through artefacts. However, all the teachers provided classroom atmospheres that made learners feel respected and emotionally safe.

6.2 Conclusion

This study found that majority of Kwabre East District primary school teachers were knowledgeable of DI. There however there were variations in their level of knowledge.

It was also found that the primary school teachers did not actually employ DI in their instructional practices. Although there were traces of differentiated practices during their instructions, these traces were however shown to have emanated from years of teaching experience and use of good pedagogical practices.

Moreover, it was noted that primary school teachers did not differentiate assessment in their classroom practices. They settled for the traditional paper and pen forms of

assessing their pupils' learning. Forms of differentiated assessment options were perceived not feasible by the teachers.

Primary schools' learning environments were found to be poor and unsupportive of DI. It was reported that most of the primary school classrooms were overpopulated, under-resourced and their desks were not conducive for differentiation. Therefore, they scarcely provided learning environments that were supportive of differentiation.

6.4 Recommendations

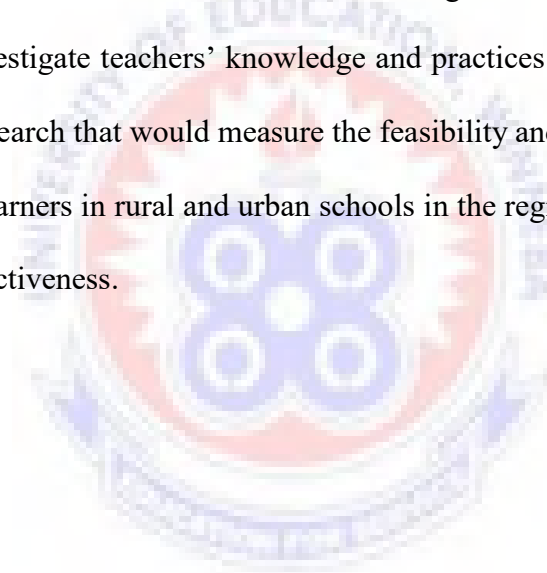
The following recommendations were made for considerations:

1. Since Differentiated Instruction has been proved by several researches as the best practice that can cater for the differing and diverse learning needs as well as the multiple intelligences of learners in our modern classrooms: It is recommended that it should be introduced to Kwabre East basic school teachers by the GES. And the teachers should be encouraged to differentiate instruction in their classrooms rather than teaching to the middle.
2. It is further recommended that in-service and on-the-job trainings and teachers' professional development programmes should be organised for Kwabre East basic school teachers on differentiation of instruction by the GES. The GES should also equip them with the necessary knowledge, skills and support to cater for the needs of all learners in their classrooms.
3. Teachers in the Kwabre East primary schools only focus on the traditional (paper and pen) methods of assessments. However, the GES should encourage and supported them to differentiate assessment by assisting and encouraging them to use alternative forms of assessment that would cater for the diverse needs of their pupils.

4. It is also recommended that the GoG and other educational stakeholders should help structure Kwabre East basic schools and their classroom environments to support differentiation. The classrooms should be equipped with comfortable furniture that would facilitate effective learning and differentiated instruction. The GES must put in place measures that would limit class sizes to the recommended number.

6.7 Suggestions for Further Research

Since this study did not explore a larger sample, it is suggested that a further research be conducted in other districts in the Ashanti Region and across other sections of education to investigate teachers' knowledge and practices of differentiation. Also an experimental research that would measure the feasibility and impacts of Differentiated Instruction on learners in rural and urban schools in the region should be conducted to ascertain its effectiveness.



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www.ghanadistricts.com

www.ghanaweb.com

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www.google scholar.com

APPENDICES

APPENDIX A:

Differentiated Instruction Questionnaire



UNIVERSITY OF EDUCATION, WINNEBA

FACULTY OF EDUCATIONAL STUDIES



DEPARTMENT OF BASIC EDUCATION

RESEARCH TOPIC: INVESTIGATING PRIMARY SCHOOL TEACHERS' KNOWLEDGE AND PRACTICES OF DIFFERENTIATED INSTRUCTION.

The M.Phil student of the above named institution wishes to acquire information for academic purpose through the administration of this questionnaire. You will be contributing immensely to this research if you respond to the items as sincerely and precisely as possible. The information you provide will be treated with utmost confidentiality. Thank You.

Please tick the right option.

1. SEX: Male [] Female []

2. What is your professional qualification? 1 = CERT' "A" [] 2 =
DIPLOMA [] 3 = DEGREE [] 4 = OTHERS, specify:
.....
3. How long have you taught/been teaching?
1-3 years [] 4-6 years [] 7- 9 years [] 10 years and
above []

4. Grade/Class: Class 1 [] class 2 [] class 3 [] class 4 [] class 5 []
class 6 []

Please indicate the degree of your knowledge of the statements in the table as:

1 = Strongly Disagree: (SD)
(NC)

2 = Disagree: (D)

3 = Not Certain:

4 = Agree: (A)

5 = Strongly Agree: (SA)

| | Learner Diversity | SD | D | NC | A | SA |
|----|--|-----------|----------|-----------|----------|-----------|
| 1 | I see all pupils in my classroom as homogeneously the same | | | | | |
| 2 | Pupils in my classroom have the same learning characteristics | | | | | |
| 3 | Every classroom has pupils with learning disabilities/abilities | | | | | |
| 4 | Gifted learners are also special pupils who need extra attention | | | | | |
| 5 | Lessons must be taught to satisfy each learner in the classroom | | | | | |
| 6 | Lessons must be taught to all pupils generally in the same way | | | | | |
| 7 | Every learner in the same class should understand the content after teaching a lesson using the best single method of teaching | | | | | |
| | Learner Interest | | | | | |
| 8 | Every pupil in the classroom has his/her own learning interest | | | | | |
| 9 | Every individual learner has learning culture and expectations | | | | | |
| 10 | Every pupil's interest, cultures and expectations should be considered when teaching (that is, if they have) | | | | | |
| 11 | Individual pupils' life situations impact their learning greatly | | | | | |
| | Learning Style | | | | | |
| 12 | Every pupil in the classroom has his/her learning style | | | | | |
| 13 | Each learner learns through a particular learning style | | | | | |
| 14 | Every pupil's learning disabilities and abilities must be addressed through his/her learning style when teaching | | | | | |
| | Lesson Planning | SD | D | NC | A | SA |
| 15 | Every pupil's needs must be considered when planning lessons | | | | | |
| 16 | Lesson objectives should consider individual learner's needs | | | | | |
| 17 | Lessons should be planned considering pupils' differences | | | | | |
| 18 | The same lesson plan must satisfy all learners in the same class | | | | | |
| | Content | | | | | |
| 19 | Content can be varied for pupils in the same classroom | | | | | |
| 20 | Specifically, contents can be reduced for pupils with learning difficulties and upgraded for gifted learners (in the same class) | | | | | |
| 21 | All learners in the same classroom must learn the same content no matter their learning differences or learning needs | | | | | |
| 22 | Content must satisfy the curriculum needs or examination requirements instead of individual pupil's needs | | | | | |
| | Process | | | | | |

| | | | | | | |
|----|---|--|--|--|--|--|
| 23 | Teaching/Learning activities should mainly/primarily be based or centred on individual pupil's needs during lesson delivery | | | | | |
| 24 | Lessons should be taught strictly in order to complete the syllabus instead of varying instruction to satisfy learner needs | | | | | |
| 25 | Each learner in the classroom should be allowed to choose his/her own preferred way of learning | | | | | |
| 26 | Learner groups in the classroom should be formed based on learners' abilities, interests, styles and learning preferences | | | | | |
| 27 | Students should be provided with the choice to work alone, in pairs or in small groups during teaching/learning | | | | | |
| 28 | Some pupils can be given individual attention during teaching | | | | | |
| 29 | A variety of teaching methods should be used during teaching | | | | | |
| 30 | I am familiar with entering into learning contracts with pupils | | | | | |
| 31 | I am familiar with engaging learners in tiered activities/lessons | | | | | |
| 32 | I am familiar with scaffolding learners in teaching/learning | | | | | |
| | Product/Assessment | | | | | |
| 33 | Questions asked during teaching should only measure pupils' understanding and progress on the content being taught | | | | | |
| 34 | Pupils should be provided with the choice to work alone, in pairs or in small groups during classroom assessment | | | | | |
| 35 | I provide variety of assessment tasks for pupils to choose from | | | | | |
| 36 | A variety of assessment tools/strategies should be employed before, during, and after teaching and learning | | | | | |
| 37 | Every learner must work on the same assessment tasks | | | | | |
| 38 | Assessment should not be separated from learning | | | | | |
| | Environment | | | | | |
| 39 | Classroom environment should be structured to support a variety of activities like flexible grouping or individual work | | | | | |
| 40 | Materials should be varied to satisfy pupils' interest/abilities | | | | | |
| 41 | Learning environment should favor every learner | | | | | |
| 42 | Normal classroom environment should include special children or pupils with disability (physical, emotional, mental etc) | | | | | |
| | General | | | | | |
| 43 | I know much about equity and accessibility for all learners | | | | | |
| 44 | I have enough knowledge on Special Education | | | | | |
| 45 | I have enough knowledge on Inclusive Education | | | | | |
| 46 | I have enough knowledge on Differentiated Instruction | | | | | |

Thank You Very Much for Your Time and Attention

APPENDIX B

Differentiated Classroom Observation Checklist



UNIVERSITY OF EDUCATION, WINNEBA

FACULTY OF EDUCATIONAL STUDIES



DEPARTMENT OF BASIC EDUCATION

Differentiated Classroom Observation Checklist

School:Subject:
..... Class: Class size Professional Qualification:
.....Gender:No. of yrs in teaching:
.....

Part 1: Pre-Observation

Please Circle the appropriate number next to each item : The below scale is
useful

1 = Poor 2 = Satisfactory 3 = Needs Improvement 4 = Good 5 =
Excellent

GENERAL (Physical Environment)

Presents an inviting, relaxed environment for learning 1 2 3
4 5

Provides comfortable desks and work areas 1 2 3 4 5

Is designed for quick and easy groupings of tables and chairs 1 2 3
4 5

Is arranged for teacher and student movement 1 2 3 4
5

Provides work areas for individual needs for knowledge/ability levels 1 2 3
4 5

Reflect current content or skill through student displays and artifacts 1 2 3 4
5

Is a place where students feel respected and emotionally safe 1 2 3
4 5

Class is sizeable enough to be managed expectedly by the teacher 1 2 3 4 5

Part 2: Observation

Please Circle the Appropriate Number Next to Each Item Using the Below Evidence of Implementation

1 = Scarcely/No 2 = Little 3 = Often 4 = Steady

CONTENT

Materials/resources supports the standards and topics 1 2 3
4

Materials/resources are age appropriate 1 2 3
4

Materials/resources are available in adequate number for the class size 1 2 3
4

Materials/resources include appropriate reference sources and materials 1 2 3
4

Teacher uses a variety of materials other than the standard textbooks 1 2 3
4

Teacher differentiates using major concepts 1 2 3 4

PROCESS

Teacher works with total groups, individuals and small groups 1 2 3
4

Teacher monitors individual and small groups 1 2 3
4

Teacher applies assessment information to guide instruction 1 2 3 4

Teacher provides time for students to actively process information 1 2 3 4

Teacher gives specific feedback to individual and/or small groups 1 2 3 4

Teacher meets the diverse needs of learners 1 2 3 4

Teacher uses a variety of instructional strategies and activities to teach 1 2 3
4

PRODUCT

Teacher uses variety of assessment tools before, during and after learning 1 2 3 4

Teacher provides opportunities for student products to be based upon the solving of real and relevant problems 1 2 3 4

Teacher allows for a wide range of product alternatives (oral, creative, etc) 1 2 3 4

Assignments necessitates that students conduct research 1 2 3 4

Teacher works with individual students or groups to determine the form of product 1 2 3 4

Teacher uses both formative and summative evaluation 1 2 3 4

APPENDIX C

Differentiated Instruction Post-Observation Conference/Interview Guide

Part 3: Post-Observation Conference/Interview

Learner Diversity

- 1) Do you think that pupils in your classroom have the same or similar learning characteristics? Yes [] No []. Briefly explain.....
.....
.....
- 2) Do you deliver/teach lessons to satisfy each learner in the classroom or the syllabus requirement?
Why?.....
.....
- 3) Do your pupils have academic, emotional, social and physical needs? Yes [] No []
- 4) How do you identify those needs? (Skip if '3' above is No)
..... ..
.....
.....

5) How do you address those needs?
.....
.....
.....

Learner Interest

- 6) Do you know that every pupil in the classroom has his/her own learning interest, culture and expectations? Yes [] No [] Specify
.....
- 7) Can you mention or explain any of such learning interests, culture and expectations?
.....
.....
- 8) Do you consider every pupil's interest, cultures and expectations when teaching (that is, if they have) Yes [] No [] Briefly explain how you do that.....
..... Skip if answer in (8) above is No

Learning Style

- 9) Do you have any idea about learning styles of pupils? (How students learn) Yes [] No [] Briefly explain if yes
.....
.....
.....
- 10) Do you address each pupil's learning disabilities and abilities through his/her learning style when teaching? Yes [] No []. If yes, How?
.....
.....
.....

Lesson Planning

- 11) Do you consider each pupil's needs when planning lessons? Yes [] No [] Why?
[]
- 12) Do you consider individual learner's needs when setting lesson objectives? Yes [] No []. Why?
.....
- 13) Aside the standard textbook, do you include a variety of materials related to the topics from other sources? YES [] No []. If yes give Examples
i..... ii
.....
iii.....
- If No, Why?
.....

Content

14) Do you vary the content of your lessons for pupils in your classroom? Yes [] No []

15) Do you reduce contents for pupils with learning difficulties and upgrade them for gifted learners (in the same class)? Yes [] No [] Give reasons

.....
.....
.....

Process

16) Should lessons be taught strictly in order to complete the syllabus or be varied to satisfy individual learner needs? Specify

.....

Why?.....

.....
.....

17) Do you employ a variety of teaching methods during teaching? Yes [] No [] Can you mention some of these methods? i

..... ii
..... ii
..... ii

18) Do you engage your students in group work? Yes [] No []

YES [] - How often?

.....

NO [] - Why?

.....
....

19) In which subject(s) do you usually or regularly group your pupils?.....

..... (skip this if 1 above is "NO")

20) How are the groups formed? (knowledge/ability level)

.....

21) Do you engage your students in projects/problem-solving activities?

YES [] - How often?

.....

NO []-

Why?.....

.....

Product/Assessment

22) Do you apply assessment information to guide your instruction? Yes [] No []

23) Do you provide variety of assessment tasks for pupils to choose from? Yes [] No []

Yes – How?
.....
.....

No – Why?
.....
.....

24) Do you agree that a variety of assessment tools and strategies should be employed before, during, and after teaching and learning? Yes [] No []

Environment

25) Do you structure classroom environment to support a variety of activities like flexible grouping or individual work? Yes [] No [] Briefly explain how you do that (If yes)
.....
.....

26) Do you think normal classroom environment should include special children or pupils with physical, emotional, mental and other disability? Yes [] No []

Why?.....
.....

General

27) Do you know of Inclusive Education? Yes [] No [] Briefly explain
.....
.....

28) Do you know of Special Education? Yes [] No [] Briefly explain
.....
.....

29) Do you know of Differentiated Instruction? Yes [] No [] Briefly explain
.....
.....

30) What is the relationship between Differentiated Instruction and Inclusive Education?
.....
.....
..... (skip this if 14 above is “NO”)

Any other any clarification enquiry:
.....

APENDIX D

Samples Transcription of Interview

Learner Diversity

Question: *Do you think that pupils in your classroom have the same or similar learning characteristics? Yes [] No []. Briefly explain.....*

Tr. 1: No, it will not be fair to say that they are similar or same. No two people will be the same, not even twins from the same womb.

Tr. 2: Yes. They are the same. You see, they have almost the same learning characteristics. They behave similarly and think alike. Eeerrrrmmm... I think it is because they are in the same age group, that's why.

Tr. 3: No! How can they be the same? They are not. Period!

Tr. 4: You know; these kids are very funny; they behave as if they live in the same house. They have same learning characteristics since they are in the same age group. I think they are similar in growth and development and sometime when we teach their understanding seem to be at the same level.

Tr. 5: No, they can never be the same because we have pupils who grab whatever you teach them and there are others who would have to be taught again and again by others, or even learn it themselves.

Tr. 8: Not at all. Well, it is because each of them has the way he/she thinks. Their thinking abilities are very different in all aspect. That's how God created it. Some are slow thinkers while others are average or fast thinkers.

Tr. 9: No, because each one of them has his/her own intelligence level and it informs their way of learning. That's why they all don't grab our lessons at a go... they are not the same at all.

Tr. 10: You know, while some of these pupils inherited higher IQ from their parents, others inherited a lower IQ. Again, while some of the children have supportive learning environments that help them to learn, others have not, so they will never be the same or have the same learning characteristics. Ah even we adults are never the same...

Tr. 11: ...They are not the same because some of the pupils are fast learners while others are slow learners.

Question: *Do you deliver/teach lessons to satisfy each learner in the classroom or the syllabus requirement? Why?.....*

Tr. 1: I teach to satisfy the syllabus requirements whether it's good or not because that is what is required of me. Perhaps that's what can make them pass their exam. And my work will be measured by their passing of these exams or otherwise. Isn't it?

Tr. 2: I follow the syllabus alright but I make sure that majority of my pupils understand the lesson, before I move on to the next aspect of the syllabus. I think that's what's important.

Tr. 6: I teach to satisfy my pupils' learning needs because the syllabus is sometimes impracticable. It is sometimes higher or lower than the level of pupils so I adjust it to suit them.

Tr. 7: I try to satisfy my pupils' needs, but not all of them: I satisfy those who would understand.

Tr. 9: You know, every teacher wants to teach to satisfy her learners but sometimes due to time factor we forget about them and concentrate on what the syllabus requires of us. But the pupils have to understand, so I try my best to teach in a way that will make them understand better.

Tr. 10: Oh, what's the use to finish the syllabus if your pupils don't understand your lessons? Because the main motive for teaching is for pupils to understand what was taught.

Tr. 11: I believe in what pupils acquire more than what the syllabus requires. If they know something, it is better than finishing the syllabus.

Tr. 12: I work with the syllabus, it guides me but I satisfy my pupils' learning needs too.

Question: *Do you know that very pupil in the classroom has his/her own learning interest, culture and expectations? Yes [] No [] Specify*

Question: *Can you mention or explain any of such learning interests, culture and expectations?*

Tr. 1: ...Mmmmmmmmmmm No.

Tr. 2: Yes.

Through observation when you observe them you'll see everything.

When I see that there is something wrong with any of them I try to advice him/her. It works that way... sometimes too I tell the head about it.

Tr. 3: Yes, they have.

You see, as a teacher you should have a very cordial relationship with your pupils. So because of how I relate to them they don't find it difficult to tell me about their problems.

I counsel them base on their problems and when it's beyond me I just invite the parents so that we find a way.

Tr. 4: Yes they do.

...through observation, tests... when after tests i realise that their performances are dwindling i interview them and find out the problem. Sometimes to interact with them and find out their problems.

I advice or counsel them when the need arises. When it is a big problem i inform my head teacher and he deals with it.

Tr. 5: You mean my children? Yes they do.

Through observation, their class performance, their attitudes in school and my interactions with them.

I address their academic needs by varying my teaching techniques, strategies and materials. With their emotional needs I talk to them and sometimes to their parents, while I counsel them on their social needs. If it is a material need, I offer a helping hand in terms of money, learning materials and other school items only if it is within my means.

Tr. 6: With the academic needs I give them enough time and offer them special attention but with other needs I just counsel them.

Tr. 9: Yes. I know very well that they have all these problems.

Well, I go to them, talk to them one-on-one and try to find solutions to their emotional problems. If it is academic, I find another way to teach them again. But I don't go into their social problems at all.

Tr. 10: Well, not really. I don't think so.

Learner Interest

Question: *Do you know that every pupil in the classroom has his/her own learning interest, culture and expectations? Yes [] No [] Specify.....*

Can you mention or explain any of such learning interests, culture and expectations?

Do you consider every pupil's interest, cultures and expectations when teaching (that is, if they have) Yes [] No [] Briefly explain how you do that.....Skip if answer in (8) above is No

Tr. 1: Yes I know but I can't explain what they are.

Tr. 2: No please, I don't know anything know like that.

Tr. 4: hmmmmmmmm I know that they have leaning interest and they have their own expectations but I can't really tell what they are

Tr. 5: Yea, I can only explain the leaner interest ... some learners are interested in calculations, others in creative arts and others in sporting activities. Yea, that's it!

Tr. 6: Well, I don't think they have. I may be wrong but that's what I think.

Tr. 8: The pupils might be interested in reading, writing, singing, dancing drawing and other activities. Each of them likes to do something.

Tr. 9: [hhmmmmmm...] I know that some of these pupils learn for example through class participation while others learn better with their friends and as such groupings will help them. That's what I can say.

Tr. 11: Actually, what I know is that some of the pupils learn on their own while others 'chew and pour'.

Tr. 14: Well, I think they have but don't have much idea about these things. You know, it's a bit technical.

Learning Style

Question: *Do you have any idea about learning styles of pupils? (How students learn) Yes [] No [] Briefly explain if yes*

Do you address each pupil's learning disabilities and abilities through his/her learning style when teaching? Yes [] No []. If yes, How?.....

Tr. 1: No please

Tr. 2: No, I don't know

Tr. 3: mmmmmm I think I've forgotten

Tr. 4: No

Tr. 5: Learning styles? ... I don't know about that.

Tr. 6: No, I don't think so

Tr. 7: No

Tr. 14: I don't know please.

Tr. 8: Yea I know but for explanation I cant. I can't explain.

Tr. 9: Yes I do. I want to be simple here; it is when a child feel comfortable learning with his friends or in a group. Am I wrong?

Tr. 10: Yes. Some of these children of these children learn best when they are taught by their friends or their teacher.

Tr. 11: Yes, I think that some learn when their friends teach them while some learn best when they are engaged in group work. That's how best i understand it.

Tr. 12: What I know is that students' learning styles entails that, some students learn by listening, others by role-playing and others through visuals.

Lesson Planning

Question: *Do you consider each pupil's needs when planning lessons?* Yes []

No [] *Why?*

Do you consider individual learner's needs when setting lesson objectives?

Yes [] No []. *Why?*

Tr. 7: Yes I do. When I'm planning my lessons I have almost all my pupils in my mind, so I make sure that I cater for them in advance as possible as I can.

Tr. 12: Yes I consider my students so that cater for the needs of each learner when I'm teaching them.

Tr. 5: Yes I consider them. It is very important to. If I will consider their needs during teaching then it needs to start from lesson preparation.

Tr. 4: Yes I know but it is not possible to consider every learner in lesson planning their lessons. They are too many. Imagine I'm to consider all these learners in my lesson plans, wont it be too much for me.

Question: *Do you vary the content of your lessons for pupils in classroom?
Yes [] No []*

*Do you reduce contents for pupils with learning difficulties and upgrade them for
gifted learners (in the same class)? Yes [] No [] Give reasons*

Results of the study again revealed that, 6 out of the 15 participants (

Tr. 2: Yes, sometimes when I see that some of them are finding it difficult to catch up
I reduce the difficulty of the content.

Tr. 6: Yes. Since my learners have different learning abilities, I sometimes mould
the content of my lessons to satisfy their understanding levels. You see that
boy sitting there, when he finishes his assignment he'll be disturbing the
others so I usually give him extra task so that i can occupy him.

Tr. 8: Yes, I adapt the content, but not all the time. You know it's not easy
considering their number. But it is very important... so that they will motivated

Tr. 10: Tr. 12) knew that lesson contents can be differentiated for learners in the same
classroom while the remaining 9 did not know. All the six unanimously stated
that since learners have different learning abilities, contents can be varied in
order to motivate every pupil to understand the lesson so that they can all
benefit from it.

Tr. 12: Yes, it's very important. Since pupils' learning abilities are not the same; they
shouldn't always learn the same thing. By the end of the day every child is
supposed to benefit from the lesson. Do you know that the high achievers get
bored when the content is way below their knowledge level? [...] The same
thing happens to the low achievers when contents are too difficult for them. So

contents can be varied so that they will all benefit. In fact, it even motivates and encourages all of them to learn.

Question: Do you provide variety of assessment tasks for pupils to choose from?
Yes [] No [] Yes – How?..... No – Why?.....

Do you agree that a variety of assessment tools and strategies should be employed before, during, and after teaching and learning? Yes [] No []

Tr. 1: No, I think they should work on the same task since that's what the system demands. We all work per the curriculum requirements and we can't treat these children differently in that respect. If we do that to them... they will find themselves wanting in future examinations.

Tr. 2: Yes. I give them several options to choose from. I provide a variety of theory questions for pupils to choose from during class tests so that each one of them will have something comfortable to do.

Tr. 6: Since they learn the same content, they should be evaluated on the same thing. Period!

Tr. 9: no, not at all. I think that since they are in the same class, learn the same thing and write the same exams at the long run; they should work on the same assessment tasks.

Tr.10: No, I don't vary them. I always give them the same assessment tasks to know if they have all been able to grasp what I taught them, but frankly I don't vary.

Tr. 11:No.... Well, assessment and evaluation are based on lesson objectives; and since the objectives are the same, they should work on the same tasks.

