

A CRITICAL ANALYSIS OF THE COGNITIVE CONSTRUCTIVIST AND SOCIOCULTURAL THEORIES AS A FRAME FOR KINDERGARTEN EDUCATION

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Abstract

The concern for how young children learn has been an issue that has agitated the minds of theories and researchers for a very long time. However, currently early childhood educators are becoming increasingly aware of the impact of the cognitive constructivist theory of learning and the sociocultural theory of learning on teacher practices in kindergarten classrooms. Thus, the main thrust of the paper was to examine the affordances of the two theories of learning in terms of teaching and learning and assessment practices in early childhood classrooms. In addition, the contrarities and connections which are inherent in both theories would be extensively discussed.

Introduction

From the standpoint of the Western world, for a very long time, the education of young children has always been anchored on theories of learning and development. These theories often highlight how young children gain consciousness and understanding about the world within which they find themselves. Traditionally, this conception about how children construct their own knowledge is deeply rooted in the writings of Rousseau, Pestalozzi and Gesell. The theories of these personalities were later refined and improved upon by Piaget and this crystallised into the genetic epistemology or cognitive constructivist theory of learning which constitutes one of the theoretical frameworks underpinning early childhood curriculum. As observed by Kamii and Ewing (1982), Piaget's cognitive constructivist theory which underscores early childhood curriculum aims at providing learning experiences which are suitable for children's age and level of development while at the same time providing room for them to construct their own knowledge. This suggests that

children tend to construct their own knowledge and understandings about the world and its phenomena whenever they are given the opportunity to explore their environment.

Piaget's version of constructivism sees the child as a solitary learner. However, Vygotsky's sociocultural theory which has become an integral part of the theoretical frameworks for the early childhood curriculum presents another view of children's development in which social interactions between children and adults become the bedrock for young children's acquisition of knowledge. As a result, knowledge which is deemed appropriate stems from the sociocultural practices, beliefs, and experiences of the community within which the child is born. Vygotsky situated his work in a tradition which dates back to Dewey (1805, 1952); Hegel (1807, 1967); Marx, (1867, 1977); Lenin (1870, 1924) and Parker and Goicochea (2000). However, there are also points of convergence between the two theories with respect to how children develop. Thus, the kindergarten curriculum and approaches to teaching and learning in kindergarten classrooms are predicated on Piaget's cognitive constructivist theory and Vygotsky's sociocultural theory both of which highlight how young children construct knowledge and their understandings about the world around them. The two theories are anchored on constructivism. Constructivism is a meaning-making theory that gives clarification about the nature of knowledge and how young children learn. Children's actual understanding about concepts stems from the processes involved in knowledge creation which usually hinges on the interactions between children's prior knowledge and new experiences they go through in life. Thus, individual children create their own knowledge through the interplay between what they already know such as ideas, events and various forms of activities they engage in and outside kindergarten classrooms. Therefore, a kindergarten teacher serves as a guide, facilitator and a partner in exploration and as well inspires children to interrogate issues that play out in every learning context.

These processes serve as means of helping young children make meaning about the world around them (Simpson, 2008; Fox, 2010; Matusov & Hayness, 2000; Parker & Goicochea, 2010; Ultamer, 2012). The thrust of this paper therefore, is to critically examine the affordances of Piaget's cognitive constructivist theory (Wadworth, 2003) and Vygotsky's sociocultural theory (Wertch, 1983) in terms of teaching and learning, and assessment practices in kindergarten classrooms. It also examines the contrarities and connections which are inherent in the theories. The paper will be configured as follows; first, the affordances of the two constructivist

theories in terms of teaching and learning, and assessment practices in kindergarten classrooms would be highlighted and examined; second, the contrarities which are inherent in both theories would be extensively discussed and finally, the elements that connect both theories would be examined to unearth the commonalities that are inherent in both theories.

Education in Kindergarten Classrooms

The theoretical frameworks of Piaget and Vygotsky's underpin the kindergarten curriculum in Ghana. The teaching and learning in kindergarten classrooms is therefore, anchored on the notion that young children actively create their own knowledge by relying on what they currently known to construct knowledge within the context of the physical and the social world. Therefore, by juxtaposing their prior experiences with their current experiences they are able to identify patterns and trends from their new experiences for the purpose of understanding the world around them (DeVries, Zan, Hilderbrant, Edmiaston & Sales, 2006). Constructivism education therefore, refers to a learning environment that takes into consideration the interest of young children by providing opportunities for them to experiment and cooperate among themselves in the course of engaging in tasks that have been assigned to them (Kamii & DeVries, 1993).

Constructivist Principles of Teaching in Kindergarten Classrooms

In kindergarten classrooms, teachers who subscribe to the constructivist principles of teaching are expected to have an in-depth knowledge about the roles they are expected to play in every facet of the teaching and learning process. Teachers who often use teaching approaches which are characterised by telling and directing children's activities have no place in constructivist kindergarten classrooms. Nonetheless, if they want to remain relevant within the context of constructivist kindergarten classrooms, they ought not to see themselves as frontal agents for producing knowledge. Rather they should make room for kindergarten children to actively engage in a variety of activities for the purpose of making meaning out of their experiences (DeVries et al, 2006). Thus, constructivist teachers act as facilitators hence, they only assist young children to construct their own knowledge in the classrooms. The constructivist teaching principles in kindergarten classrooms include creating a co-operative sociomoral environment; provoking children's interest; teaching in terms of the kind of knowledge involved; selecting content that challenges children: stimulating children's reasoning: providing adequate

time for children to explore and linking ongoing documentation and assessment with curriculum activities.

Institute a Cooperative Sociomoral Environment

The creation of a sociomoral ambiance within the kindergarten classroom is one of the principles underlining constructivist approaches to teaching in kindergarten classrooms. The sociomoral environment encompasses all facets of interpersonal relationships that cover every aspect of the child's experiences. These relationships tend to have an impact on children's learning because it engenders holistic development of children in terms of intellectual, physical, emotional, moral, social and spiritual aspects of life (DeVries, et.al 2006). Thus, a constructivist teacher is expected to consider children's needs and what individual children want to learn and then incorporate them into the curriculum. This eventually creates a classroom environment where children consider the views of their peers in their daily interactions with certain elements within the classroom and even beyond the classroom settings. In addition, children tend to see each other as equals hence, in the course of engaging in group activities they are inclined to value the views expressed by their colleagues with respect to how a task assigned to them by the teacher should be accomplished. However, this does not mean that the children have the liberty to do whatever pleases them. The teacher exercises modicum of checks and controls to make sure that none of them infringes on the rights of other children or engages in acts that are untoward (Kamii & DeVries, 1993).

Provoke Children's Interest

Children learn better if the activities they engage in are of interest them. In addition, the interest that a child shows in a particular activity appears to be an indicator of the potential that a child has. The learning environment in kindergarten classroom should be configured in such a way that the interest of individual children becomes an overriding factor in determining the elements that should be incorporated into the curriculum (DeVries, 1993). This implies that if a kindergarten curriculum is crafted within the context of children's interests, it is likely to provoke the interest of individual children to engage in certain activities. This has the possibility of providing a platform for the teachers to have inkling and insights about the uniqueness that individual children bring into the classroom context. The constructivist teacher therefore, is expected to keenly observe children as a means of identifying the interest of individual children. This would make it possible for the teacher to

incorporate appropriate activities into the curriculum to help individual children harness the uniqueness that each of them brings into the classroom context (DeVries, 1993). However, DeVries, Zan, Hildebrandt, Edmiaston and Salas (2006) outline the following parameters to guide teachers in a constructivist kindergarten classroom in the course of selecting activities for a particular lesson: First, the teachers should select materials and activities which are likely to attract a child's interest. DeVries et al (2006) further argue that the selection of materials and activities along these lines could take the form of displaying variety of materials for children to explore the possibility of identifying materials that best suit their interest. Second, there is the need for the teacher to explain the relevance of each material on display.

However, in the course of explaining the uses of each of the materials on display the teacher is expected to observe individual children for a while to establish whether some of them would be attracted to any of the materials or activities on display. Again, for the purpose of establishing the uniqueness or the interest that individual children bring into the classroom context, there is the need for the teacher to keenly observe what children do instinctively because this is a precursor for identifying a child's interest. Young children do not always express their viewpoints on whatever activities they are engaged in. However, by keenly observing them, the teacher would be able to predict certain possible questions that a child may be pondering over. In addition, there is the need for the teacher to find out from individual children what they want to learn.

However, some of the young children are usually not in a position to figure out what they want to learn hence, there is the need for the teacher to devise ingenious ways of helping young children who find themselves in such situations. For example, whenever a situation of this nature presents itself, the teacher can fall on one of the children's expressed interest as a basis of finding out if other children would like to engage in a similar activity.

Finally, there is the need for the teacher to give individual children sufficient time to decide as to which of the activities best suit their interest (DeVries, 1993). In short, selection of materials and activities that are of interest to the child, identifying the uniqueness that each child brings to the classroom and providing sufficient time for children as to which material best suits their interest tend to influence children's learning.

Teach in terms of the kind of Knowledge involved

Piaget's categorization of knowledge is very useful for constructivist teaching in kindergarten classrooms. This comprises physical knowledge, logico-mathematical knowledge, and arbitrary conventional knowledge (Wadsworth, 2003). Physical knowledge for example is created when children observe how an object reacts to certain actions undertaken by them. For instance, when a child pushes a ball and observes it rolls along. In the course of observing the reactions of the object in question, the child tends to construct a kind of knowledge termed as logico-mathematical. For example, when a child pushes a cube and comes to the realisation that the movement differs from that of the ball, then the conclusion he or she might draw is that the difference between the objects is not based on the nature of the objects but it stems from the knowledge constructed within the child's mindet in terms of the differences in the movement patterns of the two objects.

Therefore, the logico-mathematical relations constitute the basis of intelligence. Hence, individual children within the kindergarten classrooms are capable of becoming intelligent if only they are engaged in requisite activities within the kindergarten settings. As a consequence, physical activities are not only meant to help children understand the physical world but are also geared towards developing the intelligence of individual children as well. The third type of knowledge which is termed as arbitrary conventional knowledge is a kind of knowledge that can be acquired through other people (Kamii & DeVries, 1993). Hence, within the classroom context this sort of knowledge is usually transmitted to children through teachers. For example, arbitrary knowledge comprises names of objects and concepts. The import of the three types of knowledge for kindergarten teachers is that it helps them to employ differing approaches in teaching the various knowledge forms. If it is arbitrary, the kindergarten teacher is expected to tell or show children the object in question. If it is physical, the teacher is expected to engage children in varieties of activities to enable them establish the reactions therein. These sorts of activities can be done on individual basis or in small groups. In addition, if it is logico-mathematical, the teacher is expected to provide experiences which would help children to construct their own knowledge (Kamii & DeVries, 1993; DeVries, et al 2006).

Select Content that Challenges Children

Several authors (DeVries, 1993; Kamii & DeVries, 1993; DeVries et al., 2006) argue that constructivist teachers should engender the culture of inquiry-based learning in kindergarten classrooms and evaluate the kindergarten curriculum by taking into consideration the following issues; provide activities that enhance open inquiry; make sure that activities are in sync with the intellectual ability of individual children; ensure that the activities make room for variety of responses; ensure that the activities children engage in have the possibility to trigger off children's curiosity, attract attention or provoke their interest; and as well ensure that the activities provide room for young children to think on their own. On this score, DeVries et al (2006) maintain that in the course of selecting activities for young children, the teacher is expected to determine whether the content is relevant for enhancing the development of individual children in the classroom settings. The import of this is that when activities are selected on the basis of its challenging nature, the possibility is that it can enhance the intellectual development of young children because as they engage in various activities the children are able to integrate their learning experiences by drawing linkages and disconnections across different content areas.

Stimulate Children's Reasoning

According to DeVries (1993) the constructivist kindergarten teacher is expected to employ questioning techniques and other measures to enhance the thinking capacity of young children. DeVries et al. (2006) posit that there is the need for the teacher to consider the following with respect to the line of questioning and the corresponding answers:

First, there is the need for the constructivist teacher to find out what exactly is the thinking of the child on issues relating to the activities that individual children are engaged in within the classroom context. Through good questioning skills and the corresponding answers that are provided to the questions, the teacher would be able to craft follow-up activities for the purpose of clarifying certain doubts that a child earlier on might have had about certain issues that came up in the course of engaging in certain learning activities. As children become used to the interest and value that the teacher attaches to their questions, they are likely to be emboldened and inspired to share their views on issues being discussed in class no matter how worrying the issues might seem to be. However, when a teacher has the tendency of not listening to children's wrong ideas about issues that come up during class

discussions, the children would definitely not express their views in class. The snag about this situation is that the teacher would not know the challenges that individual children would be going through to enable him or her take remedial measures to address them accordingly.

Second, the preoccupation of the constructivist teacher should be to motivate young children to engage in activities that are of interest to them. In some instances the mere presentation of materials that are rich in educational opportunities would trigger off children's interest and desire to experiment and explore certain activities. The teacher is therefore, expected to ask questions that would open the door for young children to engage in practical tasks. Nonetheless, once the child has succeeded in an accomplished task, the teacher is expected to interrogate the child further to find out from him or her how each of them did it.

From an analytical perspective, five fundamental issues which impinge on how young children learn come to the fore. First, the teacher's ability to employ good questioning skills to help young children to explore the deeper meaning of some issues that come up in the various activities that they are engaged help children to learn. These activities which can be done on an individual basis or in a group context is crucial for children's development.

Second, it also brings to the fore that problem solving activities that young children engage in are likely to influence children's intellectual development. These insights are very crucial for constructivist teachers because it helps them to configure inquiry-based learning in kindergarten classrooms with respect to physical knowledge in such a way that the development of children can be enhanced. For example, a young child may be hitting a ball against a pile of sticks and then a teacher comes in and instructs the child to pick several stones and erect a pile and hit the stones from a distance with a ball as the child did in the case of the sticks. The child is then asked by the teacher to compare and contrast the reactions of the ball in both cases.

Third, Kamii and DeVries (1993) argue that teachers have certain roles to play whenever young children are engaged in activities which best serve their interest and abilities. The teacher is expected to find ingenious ways of focusing children's thinking on a particular part of the activity which is likely to enhance their development.

Fourth, the teacher is expected to augment children's effort with very useful suggestions to help them figure out the various perspectives that a particular learning material has as they are engaged in various learning

activities. This would eventually help the children to develop the capacity of looking at issues from various angles which is at the heart of the quest of engendering critical mindedness in young children. For example, in a kindergarten classroom two young children may be trying to figure out the rate at which an orange can roll on the ground from one end of the class to another. The teacher might suggest to the children to rather compare the rate at which a football and an orange roll on the ground from start to finish. However, there is the likelihood that the children might ignore some of the suggestions of the teacher particularly in a classroom context where the teacher has succeeded in making the children autonomous thinkers (DeVries, 1993).

Finally, teachers in kindergarten classroom settings are expected to develop the reasoning capacity of young children. Hence, activities should be configured in such a way that room would be given to the children to experiment and explore different kinds of materials in their environment for the purpose of heightening their intellectual development. Meanwhile, it is important for kindergarten teachers to take cognisance of the fact that if so many questions are asked within one particular activity session there is the likelihood that the children might lose interest in the activity they are engaged in. However, interventions by the teacher become useful when it has a direct bearing on a particular task that a child is trying to accomplish. Nonetheless, these interventions have the possibility of opening up a window of opportunity for children to have insights about certain concepts, thereby opening up a new world of possibilities for them (DeVries, 1993).

Provide Adequate time for Children to Explore

Young children are not in a position to construct knowledge and its attendant complicated interrelatedness within a short span of time. On this score, DeVries et al (2006) posit that there is the need for kindergarten teachers to give children sufficient time to explore whatever task they have been engaged in. This stems from the fact that they need adequate time to acquaint themselves with the nature and workings of the materials they are interacting with. Children usually need adequate time to revisit certain themes that have bearing on activities they earlier on engaged in for the purpose of deepening their understandings about certain issues that featured in the activities. For example, in a kindergarten classroom children may be given one week to learn about domestic animals; the next week might be set aside for the study of

insects and finally the subsequent week might be earmarked for the study of different colours. However, one week for each of the activities in class is a limited time for children to even understand the workings of the materials, let alone engage in painstaking probing and investigation because it takes some time for them to become used to the learning materials. Thus, when children are given adequate time and materials to engage in activities, there is the likelihood that they would find answers to issues regarding the relationships and differences that exist between two objects.

Link ongoing Documentation and Assessment with Curriculum Activities

Assessment constitutes part and parcel of the teaching and learning process in kindergarten classrooms. In constructivist kindergarten classroom context, the import of assessment is twofold; first, it is meant to assess the progress children have made in a particular instructional segment. Second, it is also meant to establish the level of effectiveness of the various segments of the curriculum. In light of this, kindergarten teachers usually keep records about individual children's growth, development and academic progress. In addition, constructivist kindergarten teachers usually study the records of individual children for the purpose of finding out the progress that each of the children has made over a period of time in specific areas of learning.

The information that the teachers obtain from the records usually serves as a signpost of children's level of development. The assessment of children's performance and reasoning ability usually take place whenever children are engaged in learning activities in class and on the playground. This suggests that kindergarten teachers must assess curriculum primarily on the basis of the opportunities that it offers children to construct knowledge which are characterised by regular patterns and interconnections (DeVries, et al, 2006). The next section examines constructivist assessment practices of teachers in kindergarten classrooms.

Assessment in Constructivist Kindergarten Classroom

According to DeVries et.al (2006) and Kamii and DeVries, (1993) assessment in constructivist kindergarten classrooms always call for teachers who have the requisite knowledge about how young children develop and the characteristics that define the various age ranges of the children who are to be assessed. In addition, they must be well informed about the various forms of alternative assessment or authentic assessment practices which are suitable for recording the growth and development of children and evaluating the kindergarten curriculum. DeVries et al argue that the following principles

which constitute the basis for conducting meaningful assessment in kindergarten classrooms stem from the constructivist orientation to assessment.

Embed Assessment in Classroom Activities

According to DeVries et al (2006), assessment in kindergarten classrooms is mainly focused on the curriculum content and teaching practices within the classroom settings. This stems from the belief that assessment is performance-based. Hence, it focuses on the activities that young children engage in within the classroom settings. Thus, through the assessment of children's classroom activities, the teacher is able to record how young children construct knowledge as they explore and experiment with learning materials, interact with their peers in small group settings and in whole class settings. The information that teachers obtain from this exercise serves very useful purposes because it provides kindergarten teachers with insights into children's abilities, interest, reasoning and challenges.

Use multiple sources to collect Assessment Evidence

Teachers can make well-informed decisions about young children when they obtain information from different sources such as observation and checklist. Keen observation is one effective mechanism for obtaining reliable information about how a child learns without interrupting activities that children are engaged in. Kamii and DeVries (1993) observe that teachers can record classroom activities in the form of narratives in journals. They further argue that a checklist is one of the effective and efficient means of documenting children's level of attainment with respect to arbitrary conventional knowledge such as knowing the names of the letters of the alphabet, animals, numerals, objects and other concepts.

Set time aside for Systematic Observation of Children

The recording of the learning that goes on in kindergarten classrooms is a step-by-step and well-organised process but a herculean task in assessment as well. This is so because at the end of the exercise there are bound to be a number of challenges that the teacher has to contend with. First, if the teacher collects a lot of data he or she might not be in a position to review them. Second, if the data are limited in scope, the information that emanates from them might not reflect the abilities of the children who have been observed. Meanwhile, on regular basis, kindergarten teachers have been observing children mentally by

taking note of the actions and pronouncements that individual children make in class (DeVries, 1993). DeVries further argues that casual observation is limited because it lacks purpose. Thus, the data that emanate from it might not have a bearing on the realities on the ground in terms of children's abilities. Therefore, keen observation is one of the effective mechanisms for monitoring children's development in kindergarten classrooms.

Examine Curriculum through Children's Actions and Words

According to DeVries et al (2006) the actions and words of children in kindergarten classrooms are possible interest and capability indicators that kindergarten teachers can latch onto for the purpose of incorporating requisite elements into the kindergarten curriculum to help young children develop the uniqueness that each of them brings into the classroom context. Through keen observation of children's actions and effective listening skills, the teacher would be in a position to identify the interests and capabilities that individual children have. Hence, on the basis of the information the teacher obtains from these sources he or she would be well-informed to select the requisite materials and set up various forms of activities to cater for the needs of individual children. As a consequence, constructivist teachers usually take records of individual children through keen observation and effective listening for the purpose of monitoring the progress that the children are making within a particular time frame. Moreover, it is meant to meet the performance standards and goal demands established by the directorate of education. Nonetheless, DeVries (1993) observes that whenever kindergarten teachers begin to implement constructivist assessment practices, the concern has always been whether they would be able to meet the curriculum demands of the district directorate of education.

View Assessment as Process that takes Place over Time

As Kamii and DeVries (1993) observe, "Assessment of children's understanding of their experiences in early childhood settings should be perceived as a process for the collection of data over a period of time instead of an occurrence"(p.56). This suggests that if a kindergarten teacher relies on information that emanates from one instance of individual children's performance to make definitive statement about a child's performance, the teacher is not likely to get a complete picture about the actual level of development of individual children. This stems from the belief that the data

which highlight children's development over a period of time provide insights into the real level of children's development.

Examine Children's Reasoning through their Actions and Words

Chittenden (1991) maintains that the examination of the reasoning of children is a scenario where the kindergarten teacher assumes "a finding out attitude" (p.32) or a viewpoint toward assessment. The preoccupation of the constructivist kindergarten teacher in this scenario is one of inquest in which the main concern is to reflect on whatever activities that children are engaged in as the basis for monitoring children's reasoning capacity rather than relying on test scores to determine children's level of reasoning. Thus, based on the teacher's findings with respect to the reasoning ability of individual children, the teacher then could rely on this data to fashion out remedial actions to help young children develop their reasoning capabilities. As a consequence, teaching and assessment are interconnected to such an extent that it becomes extremely difficult to split them.

One effective mechanism for documenting the reasoning ability of young children is through the observation of their actions. For, example, in the course of drawing the head of a dog with its mouth wide opened, a child in a particular kindergarten class used dark colours in painting every aspect of the dog's head. At the end of the drawing session the child held the piece of art work in front of a light source. However, the child could not see the teeth of the dog, the child's astonishment, informed the teacher that he did not understand the role colours play in projecting the features of objects. The teacher then intervened by instructing him to use a different colour to highlight the teeth of the dog. Thus, the children's errors provided very useful information for the teacher to fashion out appropriate interventions to help young children to correct certain errors they make in the course of engaging in activities.

Make Assessment a Collective Endeavour

Assessment in kindergarten settings is a herculean task because it comprises observing, recording and interpretation of children's understanding and actions within the kindergarten classroom settings. Therefore, there is the need for kindergarten teachers to involve parents, children and other teachers in the assessment process. Compiling and deliberating on data that emanate from teachers' observation with others who are conversant with how children learn has the possibility of augmenting and broadening the scope of the interpretation of the data. It is therefore, important for teaching assistants and

pre-service teachers to assist the classroom teacher because it would be extremely difficult for one teacher to observe all the learning of individual children within the classroom at the same time (DeVries et al, 2002).

DeVries further argues that parents also constitute very important partners in the assessment process because they provide very useful insights with respect to how children apply some of the concepts and skills they have learnt in class within the home settings. In addition, children are seen as partners in the assessment process. For example, in a kindergarten classroom where children's views are highly valued by the teacher, there is the likelihood that the children would always be ready to inform the teacher about some of the activities they often engage in within the home settings. In the next section, we will highlight and examine the differing assessment instruments that Piaget's cognitive constructivist theory and Vygotsky's sociocultural theory have to offer the world of assessment which is oriented towards constructivism.

The two roads of Piaget and Vygotsky in Kindergarten Classroom Assessment Procedures

The assessment procedures in kindergarten classroom are often influenced by the theoretical underpinnings of Piaget's cognitive constructivist theory and Vygotsky's sociocultural theories of learning. However, a painstaking examination of the assessment procedures in both cases reveal the following remarkable differences with respect to assessment instruments for gathering information about the growth and development of young children in kindergarten classrooms.

Authentic Assessment: Piaget's Instrument of Assessment

The assessment procedures underscored by Piaget's cognitive constructivist theory of learning is termed authentic assessment. For a very long time, the use of standardized, norm-referenced test was the preferred method for assessing young children's progress in learning. Recent research findings have revealed that the use of standardised, norm reference tests to determine children's progress in kindergarten classrooms is flawed (Macy & Bagnatio, 2010). A promising alternative to standardized, norm reference test is the use of authentic assessment (Begnato & Yeh-Ho, 2006). Authentic assessment (which is also termed play-based assessment, naturalistic or performance – based) is the collection of information by familiar and knowledgeable care

givers with respect to a child's behaviour and functional abilities as they unfold in kindergarten classroom settings.

Information obtained from authentic assessment can provide a collective picture of a child's strengths and weaknesses (Bagnato & Ye-Ho, 2006; Dennis, Reuter & Simpson, 2013). As a consequence, evidence gathered from authentic assessment tends to underscore the strengths and weaknesses of young children in specific learning contexts. In addition, it serves as a platform for kindergarten teachers to judge how young children put into practice their knowledge and skills in real life contexts. The following constitute examples of authentic assessment instruments:

Interview

Interview is one of the major authentic assessment instruments. This assessment instrument is very useful because it tends to highlight the capabilities of young children across a wide spectrum of learning contexts. Authentic assessment along the lines of interview is a collaborative affair between the teacher and the parents of the individual children and others who are well-informed about how young children learn. Hence, the kindergarten teacher needs assistance from teaching assistants, other teachers and parents of individual children before the requisite information about children's level of development can be ascertained through interview (Banks, Santos & Roof, 2003).

Observation

Observation is another assessment instrument for obtaining information about the growth and development of individual children in kindergarten classrooms (Dennis, Reuter, Simpson, 2013). In the course of observation, the preoccupation of the kindergarten teacher is to look out for certain capabilities that a child demonstrates in the course of engaging in activities (Neisworth, & Bagnato, 2004). The data that emanate from observation constitute a key component of authentic assessment procedures for gathering information about the children's level of development. Assessment instruments which fall under observation include running an anecdotal record, antecedent, behaviour and consequence (ABC), analysis and permanent products or portfolios (Dennis, Reiter & Simpson, 2013).

Running records is an observation mechanism which is geared towards finding out the sequence of events that happen over a period of time. This observation procedure tends to provide details about the behaviour of young children over a period of time. It is incumbent upon kindergarten teachers who

are employing this observation procedure to be objective as much as possible so that the real behaviours of children that unfold during the observation are captured instead of the teacher's judgement of what might have happened. Kindergarten teachers are expected to include the following information: date and time of the observation, names of children involved, location of the episode and what individual children said (Dennis, 2002).

Anecdotal records provide room for the kindergarten teacher to focus on a particular behaviour of individual children over a period of time for the purpose of fashioning out effective mechanism for determining the level of development of children in a group context and on individual basis as well (Dennis, Reiter & Simpson, 2013). The ABC analysis is an observation procedure which aims at recording the behaviour of a child by first establishing what triggered off the behaviour as well as what happened after the behaviour was sparked off. These factors help kindergarten teachers to establish the reasons why individual children behave in a particular way (Clay, 2000).

Portfolio assessment might consist of samples of a child's work, photos, graphics or audiotapes. These products are incorporated into a particular file for the purpose of gathering information about certain works that the child has done over a period of time. The purpose of portfolio assessment is to monitor the progress of the child over a period of time (Gullo, 2006). Meanwhile, a blend of these data collection procedures is likely to give kindergarten teachers insights into the uniqueness that individual children bring into the kindergarten classroom context. This information would then serve as a compass to enable the kindergarten teacher to effectively plan the curriculum to make it possible for young children to harness their individual potentials.

Dynamic Assessment: Vygotsky's Instrument of Assessment

The assessment instrument which is predicated on Vygotsky's sociocultural constructivist orientation is termed dynamic assessment (Feuerstein, 1979). This is an assessment procedure in which the individual child being assessed is usually guided by a teacher whose responsibility is to identify the potential of the child and offer remedial instructions when need be. According to Palincsar (1979), dynamic assessment usually gives an indication about the performance of a child as well as how the child is likely to perform in future. Hence, the performance of a child who is being assessed through the medium of dynamic assessment is meant to inform future instruction. From a Vygotskian perspective, even though conventional statistics measures tend to

indicate children's performance in a test score, they fail to highlight the stage of development of young children. Nonetheless, dynamic assessment tends to highlight a child's level of development.

The various types of dynamic assessment include Learning Potential Device and Test-Train-Test (Palincsar, 1979). Palincsar further argues that the variations stem from the nature of task a child is to engage in, the sort of support that is given and the result that is provided at the end of the assessment. For, example, the Learning Potential Device (LPD) which is the brainchild of Feuerstein (1979) is structured in such a way that the tasks aim at finding out children's level of critical thinking. Hence, it takes a child who has the ability to think critically to be able to respond appropriately to issues that are raised in the assessment protocol.

In the course of administering the LPD, the examiner freely interacts with individual children who are being examined but in the same breath the teacher takes note of the areas where the child might experience difficulty. The examiner also takes note of how the child employs reminders and prompts to resolve challenges that come up in the course of the exercise. The results that emanate from the assessment serve as a signpost for identifying the abilities that individual children have with respect to content and the strategies a child employs in resolving the problems and its possible impact on the development of children.

Another form of dynamic assessment is termed Test-Train-Test (Burdoff, 1987). This sort of assessment underscores the fact that within the context of pre-test and post-test, some modicum of learning takes place because of the guidance that is provided. In short, this type of dynamic assessment tends to portray certain aspects of competencies of children that conventional assessment is likely to gloss over. In the following section, the contrarities which are inherent in Piaget's cognitive constructivist theory of learning and Vygotsky's sociocultural theory of learning in relation to exploring teacher practices in kindergarten classrooms are examined.

Contrarities Inherent in Piaget's and Vygotsky's Theories of Learning

The differences between Piaget's cognitive constructivist theory of learning and Vygotsky's sociocultural theory of learning can be seen from the following perspectives:

Worldview and Philosophical Orientation

First, one major difference between the theories of Piaget and Vygotsky stems from their philosophical traditions and suppositions. Piaget's theory is libe-

in nature. To some extent, the theory emphasises individual children's acquisition of knowledge and autonomous development. However, Vygotsky's theory underscores the social context as the basis for children's development. Moreover, Piaget's theory to a great extent has been influenced by philosophers such as Plato, Descartes, Rousseau, Gesell, Raymond and Kant.

On the other hand, Vygotsky's theory has considerably been influenced by the philosophical orientation of Dewey, Hegel, Marx, Engels, and Lenin which emphasise the social context as the basis for knowledge acquisition. Nonetheless, the ontological stance of Piaget is extremely difficult to pinpoint because he incorporated varied Western European sources into his work. While Piaget to some extent is regarded as a sort of idealist, Vygotsky's ontological leaning is geared towards realism (Vienna & Stetsenko, 2006; DeVries, 2000; Duncan, 1995).

Social Influences on Development

Second, the theories of Piaget and Vygotsky have striking differences with respect to how social factors shape the development of young children. Piaget admits that children develop within the social context. Piaget further argues that a young child's development stems from the cooperation and conflicts that he or she experiences in the course of engaging in activities with other children within the social context. Thus, Piaget excludes the historical heritage of preceding generations which have been accumulated over the years and eventually incorporated into cultural artefacts as the basis of children's development.

Vygotsky, on the other hand sees actions which constitute the basis of children's development as a social phenomenon rather than a factor that determines children's development as it is in the case of Piaget's theory. In this vein, Vygotsky maintains that the development of young children is not influenced by the mere engagement in activities but rather via collaborative activities with other people within the social context (DeVries, 2000; Duncan, 1995).

Trajectory of Development

Third, even though the theories of Piaget and Vygotsky acknowledge the essence of children's development, they differ in terms of how development unfolds in young children. For example, in the case of Piaget, the intellectual capacity of the child to learn is first created within and it is just after this that the capabilities which have been created within would have relevance in terms

of a child's cognitive development which is usually predicated on the conflicts and collaborations that a child experiences in the course of interacting with certain elements and other people within the social context. However, in the case of Vygotsky the relationships that a child forges with other people within the social context constitute the basis of cognitive development. Thus, on the basis of these variations, Piaget's theory is often termed "inside-out" while that of Vygotsky's is referred to as "outside-in theory" (Lourenco, 2012; DeVries, 2000; Duncan, 1995)

Language as a Tool for Development.

Finally, another striking inconsistency about the theories of Piaget and Vygotsky arise from their conceptions about the role language plays in the cognitive development of young children. Piaget observes that children, to some extent use similar words as it is in the case of adults to express their views with respect to certain concepts in science. However, the meanings they attach to the concepts differ from that of adults. As a consequence, children's understanding of concepts in science develops in a step-by-step process which eventually leads to the development of children's understanding and application of science concepts for the benefit of society. This notion of development is likely to enhance the learners' ability to go beyond the status quo and create something novel for society. However, Vygotsky argues that language is a tool for children's acquisition of scientific concepts. This stems from Vygotsky's conception that children acquire scientific concepts through schooling (DeVries, 2000). In short, the two theories give us different insights as to how young children develop. In the next section, we will examine the connections between Piaget' and Vygotsky's theories of learning.

Connections between the Theories of Piaget and Vygotsky

The similarities between the theories of Piaget and Vygotsky can be seen from the following perspectives:

Framework for Understanding Human Psyche

First, one key connection between the theories of Piaget and Vygotsky is that they provide a framework which highlights how the intellect of young children develops. For the purpose of providing insights into how young children acquire knowledge, both Piaget and Vygotsky employed the genetic research model to explain the developmental processes of the intellect of young children. Both Piaget and Vygotsky acknowledged that the psyche of young children goes through qualitative changes over a period of time. Therefore,

there is a remarkable difference between the intellect of adults and young children. The qualitative transformations that take place in the course of a child's interactions with peers, adults and certain elements in the environment are crucial factors for engendering the intellectual development of children (Pass, 2004).

Dialectics as Basis for Development

Another resemblance between the theories of Piaget and Vygotsky is that both of them acknowledged dialectics as the basis for enhancing the intellectual development of young children. Even though Vygotsky employed the Marxist brand of dialectic reasoning for the purpose of enhancing the development of young children, Piaget's dialectic reasoning was idealistic in nature. In spite of this difference, both Piaget and Vygotsky conceded that dialectic reasoning engenders qualitative development of young children over a period of time (Devries, 2000).

Psychological Constructivist Theories

An additional similitude between the theories of Piaget and Vygotsky is that they are considered as constructivist theories. These theories emphasise that individual children construct their own knowledge on the basis of the interplay between what they already know and their interactions with new elements such as events and ideas that they come into contact with within the environment. Therefore, constructivism in any of its forms rejects the conventional notion that human experience is inborn which only lie in wait for the right time to unfold (Duncan ,1995).

Action as the Basis for Development

Finally, another connection between the theories of Piaget and Vygotsky is that human action is considered as a catalyst for engendering the development of young children. The theories emphasise that the relationship that is forged between individual children, their peers and teachers in classroom settings, which are usually defined by various forms of interactions such as cooperation, collaboration and problem solving constitute the basis of children's development. Therefore, development is neither inborn nor something that has already been planned but it is human action that triggers off development (Pass, 2004).

Conclusion

The examination of the affordances, contrarities and connections which exist between the theories of Piaget and Vygotsky has indeed been very instructive because it has brought to the fore how the theories influence teacher practices in kindergarten classrooms as well as the convergences and divergences which are inherent in the theories. First, the affordances of the theories in terms of constructivist's principles of teaching and learning, assessment practices in kindergarten classrooms and the implications of the theories for teaching and learning in terms of their emphasis on activity-based learning in kindergarten classroom have been unearthed.

Furthermore, the contrarities that exist between the theories with respect to the worldview and philosophical orientation, social influences on development, trajectory of development, and language as a tool for development have extensively been examined. The differences which are inherent in the theories are very relevant because they present differing perspectives about how young children learn. These insights would help kindergarten teachers to employ relevant constructivist teaching and learning principles and its attendant assessment practices to help young children develop their individual uniqueness.

Again, the connections which are inherent in the theories in terms of framework for human development, dialectics as basis for development, psychological constructivist theories and action as the basis for development have also been discussed. The similitude between the theories gives kindergarten teachers insights into how the active involvement of children in learning activities promotes children's construction of knowledge about their world. The theories therefore, provide insights into the developmental dilemma of young children. However, the similarities between both theories suggest that the theories can be merged. Nonetheless, any attempt to employ an eclectic approach for the purpose of merging the theories has the possibility of resulting into an incoherent theory instead of an integrated theoretical framework which Piaget and Vygotsky tried to construct. Thus, the theories should remain as they are because each of them tells half of a good story hence, each can be used to complement the other.

Implications of the Theories for Educational Administrators

The theories of Piaget and Vygotsky emphasize activity based learning in the kindergarten classrooms for children to construct their own meaning. It is implicitly and explicitly clear that the learning environment of kindergarten classrooms should be well resourced with the relevant teaching/learning

materials for maximum effect. For that to be realised, educational administrators need to be abreast with the kindergarten curriculum and ensure that relevant teaching and learning aids are procured in reasonable quantities for sufficient and maximum interactions of learners with the aids for meaningful learning to take place.

Research has shown that the more a learning activity addresses the five senses, the more effective the learning activity becomes and has more permanency. According to Mehmet and Ali (2007), the human memory works in the following proportions and so people will remember:

- 10% of what they read
- 20% of what is heard
- 30% of what they saw
- 50% of what they saw and heard
- 70% of what they said, and
- 90% of what they did and said

When due consideration is given to the retention rates above, and the kindergarten classroom setting, it is important for educational administrators to provide useful teaching aids that young children can interact with and construct their own meaning of the world around them. It is also important for sufficient time spaces to be allocated to learners accompanied by much creativity in leading kindergarten children to exhaust all the range of possible experiences that they generate in coming into contact with their new learning activities at all times.

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