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A critical analysis of the cognitive constructivist and socio-cultural theories as a frame for kindergarten education

Abstract

The concern for how young children learn has been an issue that has agitated the minds of theorists and researchers for a very long time. However, currently early childhood educators are becoming increasingly aware of the impact of both cognitive constructivist and the socio-cultural theories and their implications for teaching and learning in kindergarten classrooms. The study was based on the premise that the teaching and learning in kindergarten classrooms is anchored on the notion that young children actively create their own knowledge by relying on what they already know to construct knowledge within the context of the physical and the social world. The purpose of the study was to examine the impacts of Piaget's cognitive constructivist and Vygotsky's socio-cultural theories of learning on teacher practices in kindergarten classrooms. Three (3) research questions were formulated to guide the study. The study sought to examine the implications of the two theories of learning in terms of teaching and learning and assessment practices in early kindergarten classrooms. In addition, the study revealed contrarities and connections which are inherent in both theories in terms of how children learn. It was recommended to teachers to augment children's effort by engaging them in various learning activities which would eventually help the children to develop the capacity of looking at issues from various angles and engendering critical mindedness. Finally, it was recommended to educational administrators to be conversant with the kindergarten curriculum and see to it that relevant teaching and learning materials are provided to enhance effective teaching and learning in kindergarten classrooms have been highlighted.

Introduction

From the standpoint of Africa and other parts of the world, the education of young children for a very long time has 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 was deeply rooted in the writings of Rousseau, Pestalozzi, and Gesell (Wadsworth, 2003). 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 underscores early childhood curriculum and 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 environments. Piaget's version of constructivism sees the child as a solitary learner while Vygotsky's socio-cultural sees social interactions between children and adults as the bedrock for young children's acquisition of knowledge. As a result, knowledge which is deemed appropriate stems from the socio-cultural practices, beliefs, and experiences of the community within which the child is born. 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 can be predicated on Piaget's cognitive constructivism and Vygotsky's socio-cultural theory 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.

Individual children create their own knowledge through 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 exploring and inspiring 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 & Goicoechea, 2010; Ultamer, 2012).

Statement of the Problem

Many learning environments do not take into consideration the interest of young children because children are usually not given the opportunity to create their own knowledge through interacting with learning materials and with their peers (Kamii & DeVries, 1993).

The Purpose of the Study

The purpose of the study was to critically examine the impact of Piaget's cognitive constructivists and Vygotsky's socio-cultural theories of learning on teaching and learning as well as assessment practices in kindergarten classrooms in Ghana. It also examines the contrarities and connections which are inherent in both theories and how they influence children's learning.

Research Questions

- Which constructivists teaching principles contribute to make young children get meaning out of their experiences?
- What are the points of convergence between Piaget's cognitive constructivists and Vygotsky's learning theories?
- What are the connections between the learning theories of Piaget and Vygotsky?

Literature Review

Constructivist Education in Kindergarten

The theoretical frameworks of Piaget and Vygotsky's appear to underpin the kindergarten curriculum in Ghana because the curriculum gives children the opportunity to create their own knowledge by interacting with learning materials individually and with their peers. 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 already know and constructing knowledge within the context of the physical and the social world. Therefore, by matching 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 refers to a learning environment that takes into consideration the interest of young children by providing opportunities for them to experiment and cooperate among one another in the course of engaging in tasks that have been assigned to them (Kamii & DeVries, 1993).

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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. Kindergarten children are to be offered the opportunity 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 guide young children to construct their own knowledge in the classrooms.

There are several constructivist principles that can guide teaching and learning in kindergarten classrooms. One of them is creating a cooperative sociomoral environment. The sociomoral environment encompasses all facets of interpersonal relationships that cover every aspect of the child's experiences. These relationships tend to impact on children's learning because they engender 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 each individual child wants 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 within the classroom and even beyond the classroom settings. However, 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).

Another important principle is provoking children's interest in the classroom. Children learn better if the activities they engage in are of interest to them. In addition, the interest that a child shows in a particular activity appears to be an indicator of the potentials that the particular child has (DeVries, 1993). The constructivist teacher therefore, is expected to keenly observe children as a means of identifying their interest. 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; DeVries, Zan, Hildebrandt, Edmiaston & Salas, 2006; Wadsworth, 2003).

It also involves selecting 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 providing activities that enhance open inquiry; making sure that activities are in sync with the intellectual ability of individual children; ensuring that the activities make room for variety of responses; ensuring that the activities children engage in have the possibility to trigger off children's curiosity, attracting attention or provoking their interest; and ensuring that the activities provide room for young children to think on their own(DeVries et al., 2006).

The next principle deals with stimulating children's reasoning. According to (DeVries, 1993; DeVries et al., 2006), the constructivist kindergarten teacher is expected to employ questioning techniques and other measures to enhance the thinking capacity of young children. Teachers in kindergarten classroom settings are expected to develop the reasoning capacity of young children through experimenting and exploring different kinds of materials in their environment for the purpose of heightening their intellectual development (DeVries, 1993).

A further principle deals with providing 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.

Linking ongoing documentation and assessment with curriculum activities is yet another principle. 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 (DeVries, et al, 2006).

Another principle worthy of mention is that assessment in constructivist kindergarten classrooms always calls 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., 2006; Kamii & DeVries, 1993).

According to DeVries et al (2006), assessment in kindergarten classrooms focuses mainly 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 insights into children's abilities, interest, reasoning and challenges.

Teachers are also required to use multiple sources to collect assessment evidence. This is because 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 & DeVries, 1993). Again, 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 alphabets, animals, numerals, objects and other concepts.

Teachers are expected to 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. 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). Keen observation is one of the effective mechanisms for monitoring children's development in kindergarten classrooms.

A further principle involves examining 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 children's actions and effective listening skills, the teacher would be in a position to identify the interests and capabilities that individual children have.

Assessment should also be seen 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.

The principle involves examining children's reasoning through their actions and words. One effective mechanism for documenting the reasoning ability of young children is through the observation of their actions. Chittenden (1991) maintains that the preoccupation of the constructivist kindergarten teacher 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. As a consequence, teaching and assessment are interconnected to such an extent that it becomes extremely difficult to split them apart.

The final principle involves making 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.

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 socio-cultural 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.

The assessment procedures underscored by Piaget's cognitive constructivist theory of learning is termed as authentic assessment (Begnato & Yeh-Ho, 2006; Macy & Bagnatio, 2010) Authentic assessment is a play-based assessment or performance-based assessment that involves 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 weakness (Bagnato & Ye-Ho, 2006; Dennis, Reuter & Simpson, 2013). Examples of authentic assessment instruments include interview and observation.

Interview

Interview is useful assessment instrument 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 lookout 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 and anecdotal records, antecedent, behaviour and consequence (ABC), analysis and permanent products or portfolios (Dennis, Reiter & Simpson, 2013).

One of the observation procedures is running records. 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 should be objectively captured and should 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). A second observation procedure involves the keeping of anecdotal records. 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).

A third observation procedure entails ABC Analysis. 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).

Another observation procedure involves incorporating Permanent Products or Portfolios. 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).

The assessment instrument which is predicated on Vygotsky's socio-cultural constructivist orientation is termed as 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 potentials of the child and offer remedial instructions when need be (Burdoff, 1987; Feuerstein, 1979; Palincsar, 1979).

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

The differences between Piaget's cognitive constructivist and Vygotsky's socio-cultural theories of learning can be seen in terms of worldview and philosophical orientation, social influences on development, and language as a tool for development.

First, one major difference between the theories of Piaget and Vygotsky stems from their philosophical traditions and suppositions. Piaget's theory is liberal 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 emphasis the social context as the basis for knowledge acquisition. While Piaget to some extent is regarded as a sort of idealist, Vygotsky's ontological leaning is geared towards realism (Vienna & Stetsenko, 2006; DeVriess, 2000; Duncan, 1995).

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. Vygotsky, on the other hand sees action which constitutes 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; Lourenco, 2012; DeVries, 2000; Duncan, 1995)

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. 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 how young children develop. The next section examines the connections between Piaget' and Vygotsky's theories of learning.

The Connections between the Learning Theories of Piaget and Vygotsky

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

First, one key connection between the theories of Piaget and Vygotsky is that they provide a framework which highlight 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. Hence, 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).

Second, another resemblance between the theories of Piaget and Vygotsky is that both of them acknowledge 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).

Third, an additional similitude between the theories of Piaget and Vygotsky is that they are considered as psychological constructivist theories. These theories emphasise that individual children constructs 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).

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 and their peers and teachers in classroom settings which are usually defined by various form of interactions such as cooperation, collaboration and problem solving constitute the basis of children's development. Therefore, development is nether inborn nor something that has already been planned but it is human action that triggers off development (Pass, 2004).

Implications of the Theories for Educational Policy and Practice

The twin 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. In this regard, educational administrators need to be abreast with the kindergarten curriculum and see to ensure that relevant teaching and learning aids are procured in reasonable quantities for sufficient and maximum interactions by 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 (Metmet & Ali (2007) Mehmet and Ali (2007) further argue that human memory works in the following proportions:

- 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 foregoing retention rates of children's learning above, and the kindergarten classroom setting, it is important for educational administrators to provide useful teaching and learning materials 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 in their new learning activities at all times.

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 and so by keenly observing them, the teacher would be able to predict certain possible questions that a child may be pondering over. Teachers should select activities which are likely to attract a child's interest by taking children through and allowing them to explore those that best suit their interests.

Teachers are 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 engendering critical mindedness in young children.

It also brings to the fore that problem solving activities that young children engage in should be those which 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.

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. 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.

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