

Conceptual Model of Whole Brain Teaching – Based Visual Literacy for Early Childhood Learning

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ABSTRACT

This research aims to analyze Whole Brain Teaching – based visual literacy model design in early childhood learning of age 5-6 years. The research methods used are literature studies. In early childhood, it is essential to pay attention to the development of motor skills and language because both of these abilities help early childhood in expressing themselves, either idea or emotional. The whole brain teaching model essentially maximizes the role of the brain and involves the use of the senses, gestures, collaboration, and communication by the giver and recipient of the message. On the other hand, early childhood expresses ideas and flavors about the surrounding environment with movement and speech. Body and language movements demonstrate the learning ability of early childhood to interpret visual messages accurately. The whole brain teaching model-based visual literacy has six stages: class-yes, five class rules, teach-okay, scoreboard, hands and eyes, and switches.

Keywords: whole brain teaching, visual literacy, motor capability, language proficiency, early childhood.

INTRODUCTION

Early childhood, in its growth and development, was an active learner (Bredekamp & Copple, 1997). The brain plays an essential role in rapid childhood development. In this era of sustainable development goals, early childhood development needs to get significant attention as it affects the broader education system (Hagglund & Samuelsson, 2009). Thus, early childhood education plays a vital role in preparing citizens around the world who are responsive to the surrounding changes for global resilience (UNESCO, 2004).

Early childhood learning begins with knowing everything in the surrounding environment, such as a house, kitchen, or garden. The surrounding environment in everyday life provides a direct experience to the child during learning or playing. During the expertise of its setting, the body and mind must work actively to manage the information surrounding it (Froebel, 1995).

Early childhood is an individual who needs to be given freedom of exploration. Nevertheless, it also needs to be balanced with the mentoring of adults and the surrounding community. Learning and playing must be integrated into early childhood learning. Basically, each child has the competence and willingness to understand the surrounding that needs to be developed. Freedom of exploration can be realized by prioritizing children's interests and ideas and balancing the position of adults and children (Johansson & Samuelsson, 2006). Thus, three aspects need to be fulfilled in early childhood education, namely the integration between play and learning, integration between mentoring and learning, and the relationship between children's experience in daily life and learning (Samuelsson & Kaga, 2008).

According to neuroscience research, early childhood learning must be game-based. It is significant for brain development and facilitating children to develop strategies and motoric

skills, develop language skills and socialize with surrounding people, as well as become a creative individual in solving problems. Child Learning readiness and recognizing the school world can be stimulated through playing activities (Zigler et al., 2004). Experience during play provides a stimulus to the development of child intelligence (Bronfenbrenner, 1994; Engel et al., 2013). However, it is not the case with early childhood learning practices in Indonesia. Early childhood who entered the playgroup and kindergarten was introduced with an academic-focused curriculum such as reading, writing, and counting. Such conditions cause early childhood to be far from learning experiences oriented to playing activities. Early childhood education focused on the academic impact on the slow development of children's socio-emotional (Elkind, 2008).

The Indonesian government has adopted policies and programs that prioritize early childhood education and development for the last nearly two decades (World Bank, 2016). There is an increase of early child education instituts in East Java annually, namely in the year 2015, there are 16,724 institutions, the year 2016 there are 18,163 institutions, in the 2017 there are 20,154 institutions, and the year 2018 increased to 25.271 institutions. Especially in Jember, in 2018, there are 2.201 institutions, which include: 1.263 kindergartens, 543 study group, 20 nursery garden, and 375 similar early childhood education units. In quantity, the increasing number of institutions, teachers, and children in early childhood education becomes a positive appreciation to equalization education, but not necessarily the quality of learning in each institution is also better.

Based on the observation at the two kindergartens in Jember, East Java, children at 5-6 years old have a passive in the process of learning and less creative. Besides, some children have not been able to share with their friends. That problem is affected by several factors. The teacher dominates learning activities; children do not involve actively, no other models, monotonous, out of children's interest. Consequently, motor skills are less developed and the lack of opportunities for children to explore their creativity.

The emergence of such problems resulted in the learning of the proses not correctly as expected. Therefore, in need of a learning model that can overcome the problem. In addition to using the perspective of the Whole Brain Teaching (WBT) model, the research also uses visual literacy, which affects the development of motor and language of early childhood. Visual literacy is the learning ability to interpret message vision accurately and to make the message (Pattersson, 2007). Improved writing and reading ability in early childhood is by drawing. By drawing, it can give great freedom to understand its meaning (Davido, 2016). The ability to understand the child's visual meaning is categorized as a child who has visual literacy height while having difficulty understanding the meaning visually, the child is classified as a child who has visual literacy low. Young visual literacy in children affects the motor and language aspects of early childhood.

LITERATURE REVIEW

Physical ability is defined as an individual's ability to use his body to solve problems, express ideas and emotions, and manipulate objects. According to this definition, one of the fundamental characteristics of this type of physical ability is the ability to use the body in different activities requiring skills to achieve one's goals. Motor capability (crude and fine motor) is part of kinaesthetic intelligence. For example, a child can manipulate objects (Gardner, 1983). Kinaesthetic-physical information also involves ability in coordinating body movements, balancing body movements, body strength, the flexibility of movement, speed movements, tactile, and haptic skills (Fograty, 1991; Gardner, 1993; Pohl, 2000).

Papalia and Olds (1995) explained that the language development of children aged 4-6 years past two phases, as follows: (1) the ability to hear and record voices of the language understood by them, (2) the ability to express the word and use it for communication, for example, to declare the agreement, and to interact. Language intelligence in children aged 4-6 years can be identified from the blatant behavior of their language, among which are: (1) enjoying the interaction of speech, (2) tell a short or straightforward story, (3) remember your name, place, date, small things quickly, and (4) enjoy reading books (6) such as spell words, love to listen, (7) enjoy language games, (8) enjoy to listen to the radio, and have good grades in reading language lessons and writing (Martini & Edwita, 2014). Currently, the study shows more clearly how writing and reading can be developed naturally by children (Beaty, 2013), how children understand their world through playing exploration, and how children's brains take information and make a rule to help children use it. The research has changed thinking about how children thrive and how to support their growth (Roskos, Christie, & Richgels, 2003).

The survey in California, Arizona, Texas, Montana, Louisiana, Minnesota, Missouri, Florida, Pennsylvania, Arkansas, Tennessee, and Alabama, explains that 70% of instructors assessed the WBT system better and superior to other teaching systems. Whole Brain Teaching or brain learning is trying to enable the whole brain to play a role in learning activities, and the implementation of the whole-brain teaching model is indispensable in improving motor skills and language in children. Learning activities with whole-brain teaching emphasize the interaction between teachers and students so that learning becomes enjoyable (Biffle, 2013). Meanwhile, learning models that exist during this time pose boredom to the students. The studies have also explained that Whole Brain Teaching can improve the performance of learning outcomes (Clark, 2016), allow teachers to understand how we learn in practical ways to teach (Jensen, 2005).

Whole Brain Teaching is formerly known as "Power Teaching," which is an educational reform created in 1999 by Crafton Hills, Chris Biffle, Jay van Delfin, and Chris Rekestad (Wong, 2005). Whole Brain Teaching is a participatory model of learning, where the teacher uses techniques to engage the child in education and to make the class easy in the learning activities. The core activity of Whole Brain Teaching is to attract the attention of the audience by involving five senses, gestures, cooperative/cooperation, and communication so that learners are more focused on the material teachers are given (Biffle, 2013). This learning activity emphasizes the interaction between teachers and children.

The superiority of the Whole-brain Teaching model is that it can involve all brain quadrants, as well as to increase child involvement (Biffle, 2013). It can be accomplished by using multi-modalities in the class (Calhoun, 2012). Multi-Modalities include guided media, graphs, and diagrams (visuals), music, discussion (oral), gesture, drama, and storytelling (kinaesthetic) (Palasique, 2009). Whole Brain Teaching is learning with an instructional approach derived from an overview of neurolinguistics based on right and left brain functions (Biffle, 2013). They are learning engagement by activating the entire brain (Stearns, 2016) and is based on the principles of cooperative learning (Alford, 2014). Brain-based education can also help to increase the recall rate of children (Inci & Erten, 2009). Therefore, the teacher needs to understand the relevant teaching style, how the brain functions produce something interesting (Dufford, 2004).

There are six essential elements in the Whole-brain Teaching showing the function of components to the human brain.

Table 1. Six elements in WBT and its relation to the brain

Elements	Brain Parts	Function
Class-Yes	Pre- Frontal Cortex	An excitatory center in the brain. This area is like a power outlet that must be unlocked, by repeating Class-yes, then the other part of the brain processes stimulation
Five class rules	Pre-Frontal Cortex,	Attention Grabber
	Broca	Hear
	Wernicke,	Speaking
	Visual Cortex	Viewed
	Motor Cortex	Motor Hand System
	The Limbic System	Create gestures
	Hippocampus	Long-term memory
Teach-Okay rules	Same as Five class rules	Student activities in the classroom.
Scoreboard Keys	Limbic System's Emotions	Create gestures
	Amygdala (Mighty OhYeah, Mighty Groan!)	Recognizing joyful and euphoric feelings
Hands and Eyes	Pre-Frontal Cortex	Focus all mental activity by seeing and hearing teacher explanations
Switch	Kawasan Broca	Enable hearing Ability
	Kawasan Wernicke	Enable Speech ability.

Sumber: Biffle, C (2008).

There are seven techniques known as "the big seven" to use Whole Brain Teaching in learning, namely:

Table 2. Seven techniques to use WBT in learning

Stages of Whole Brain Teaching	Implementation in learning activities	
	Teacher's activities	Children's activities
1. Class - Yes	<ul style="list-style-type: none"> Teachers convey the rules and techniques of whole brain teaching. Teacher says the <i>class</i> 	<ul style="list-style-type: none"> Children listen and pay attention to teacher explanations. Children follow the teacher's direction The child replied
2. Five Class Rules	<p>The teacher conveys class rules consisting of:</p> <ul style="list-style-type: none"> First, the child raises one finger hand (when attendance) Second, the child grows two fingers side for permission to speak Third, hand-picked three fingers to exit the class Fourth, if the teacher says Teach, children replay Okay, then discuss with the group. 	<ul style="list-style-type: none"> Children listen and pay attention to teacher explanations. Children practice the first to fifth rules

Stages of Whole Brain Teaching	Implementation in learning activities	
	Teacher's activities	Children's activities
	<ul style="list-style-type: none"> Fifth, if teachers say hand and eyes during the lesson, then children answer hands and eyes by both sides and placing them above the table. 	
3. Teach-Okay	<ul style="list-style-type: none"> The teacher divides children into a small group consisting of 2 children in 1 group. The teacher instructs each group to perform activities such as discussing observing, writing, coloring, cutting, pasting, and paying attention to the teacher's explanation. Teachers say "Teach" to children and children teaches the material to their small group of friends using gesture 	<ul style="list-style-type: none"> Children gathered in groups. The child pays attention to the explanation and follows the teacher's instruction. The child replied "Okay" and taught each other the material to a friend of his small group using gesture
4. The Scoreboard	<ul style="list-style-type: none"> The teacher gives a satisfactory score (smile/4 stars"satisfactory") when the child performs well in the whole brain teaching step with movement/gesture. Teachers give a less satisfactory score (smile picture/2 stars "less satisfactory") if the child does not do well stages of whole brain teaching with gestures/gesture 	<ul style="list-style-type: none"> Children observe the score given by the teacher
5. Hand and Eyes	<ul style="list-style-type: none"> Teacher says hand and eyes Teacher redefines from The scoreboard results 	<ul style="list-style-type: none"> The child responds to hand and eyes by immersed both sides and putting them on the table. Children observe teacher explanation
6. Switch	<ul style="list-style-type: none"> Teachers divide the group back, the child with a high score paired with a child with a low and sufficient value. Teacher says Switch, then 	<ul style="list-style-type: none"> The child divides the group already determined by the teacher.

Stages of Whole Brain Teaching	Implementation in learning activities	
	Teacher's activities	Children's activities
	the child's high value teaches a child whose value is low and the child whose value is enough.	
7. Mirror	<ul style="list-style-type: none"> Teachers instruct the child to re-explain the material using gesture Children teach their friends who have been divided into previous groups Teachers help the child to make conclusions that have been learned using "gesture." 	<ul style="list-style-type: none"> The child pays attention to a material explanation from his friend using gesture Children make conclusions of materials that have been studied using "gesture."

Source: *Whole Brain Teaching* (Biffle, 2013)

This Whole Brain Teaching model gives the child the freedom to visualize, draw, and communicate (Wolken, 2017). This model is very flexible and can be used for all age groups ranging from children to students (Preslee, Kharsati, & Prakasha, 2017). The Whole Brain Teaching does not only have a fun-to-grade stewardship technique unless it has a pleasant knowledge and character that is in a child.

The Whole Brain Teaching model is unique because it is implemented in a pleasant (Preslee et al., 2017). Its power lies in the suppression of mastery, or the submission of understanding or ability of a child's ability to reveal the concept or material that the teacher delivered (Alford, 2014). Activities created by the teacher by making the child not burdened and relaxes during learning. Engaging the child in every joyful step of knowledge will make the child is fostered to understand learning. Furthermore, the role of teachers in the model of Whole Brain Teaching is as a driver for children to learn to be able to construct their knowledge through various citizens, including aspects of communication. Children are involved in understanding the idea of learning by communicating with each other and share knowledge with their partner. It is following the opinions of Silver and Smith (1996) The teacher's assignment is: (1) involving the child in every learning assignment; (2) regulate the intellectual activity of children in classes such as discussion and communication; and (3) help children understand the subject matter and monitor their understanding.

Brain-based learning is based on the theory that every brain is unique and that not all children learn in the same way, and everyone can learn (Duman, 2006; Tufekci & Demirel, 2009). Brain-based learning differs from the traditional method because it emphasizes meaningful learning is no longer memorization (Tufekci & Demirel, 2009). In the stage of the learning model of Whole Brain Teaching, there is a gesture that is meaningful symbolic movements, which have a positive and beneficial meaning to help the child in developing the motor aspect (coarse and smooth) and understand what it teaches.

One of the essential physical developments during early childhood was the advanced development of the brain and nervous system (Moulson & Nelson, 2008; Nelson, 2009). Although the brain continues to evolve in early childhood, the brain does not develop as fast as infancy (Santrock, 2011). When children reach age 3, the brain is three-quarters of the size of an adult brain. At the age of 6, the brain has reached approximately 95 percent of the adult

brain volume (Lenroot & Giedd, 2006). Whole Brain Teaching based on the four quadrants of the entire brain (Davis, 2011; Pretorius, Steyn, & Johnson, 2012; van Oordt, van Oordt, & du Toit, 2014). Approximately 90% of the population, the left cerebral hemisphere, is responsible for logical, analytical, quantitative, and fact-based knowledge; While the right region dominates the dominant support and coordinates of intuition, emotion, spatial perception, and kinaesthetic ability (Wong & Wong, 2015).

The Whole Brain Teaching movement is also to train children in developing muscles. Early childhood is an ideal opportunity for children to learn to establish control over their muscles and movements. During this critical period, the neural pathways develop (in the brain) through the myelination process. This process lasts from birth until the age of 4 years, then continues slower until the age of 20 years. Myelination process allows children to develop control over motor functions (Leppo, Davis, & Crim, 2000) because it can be concluded that model Whole Brain Teaching strongly influences on motor ability in early childhood.

Visual literacy is the learning ability to interpret accurate visual messages and to create words (Heinich, Molenda, Russell, & Smaldino, 1999). International Visual Literacy Association (IVLA) describes the four visual definitions of literacy. (1) A group of human vision competencies can develop by viewing and at the same time owning and integrating other sensory experiences, (2) educated ability to interpret visual Simbo communication, (3) ability to translate visual images into verbal language and vice versa, (4) ability to search and evaluate information in visual media (Pettersson, 1993). "Literacy" can be defined as the ability to read and write messages on the service from three objectives: (a) recording and preserving experience; (b) reflecting, exploring, and expanding one's thoughts and feelings; and (c) communicating and sharing ideas with others (Edwards & Willis, 2000). A long history of early research literation (Whitmore et al., 2004) shows that young people's interactions with text, whether with an electronic display, product packaging, published books, or pencil marks on paper, involve practices that include semiotic, multimodal, and social (Kress, 1997, 2003; Rowe, 2008; Siegel, 2006).

Currently, research shows more clearly how writing and reading can be developed naturally by children (Beaty, 2013), how children understand their world through playing exploration, and how children's brains take information and make a rule to help children use it. The research has changed thinking about how children thrive and how to support their growth (Roskos, Christie, & Richgels, 2003). Pre-school children's literacy activities are involved in various literacy behaviors, such as hearing stories, discussing stories, composing stories, scribing "letters" on family and friends, writing their names, and making their marks like prints. At present, there is a consensus in society, that literacy research is a process that starts from birth, when babies start experimenting with their language (Temple, Nathan, & Burn, 1993 in Beaty 2015). Writing and reading along with the skills of speech, thinking, emotion, social, and the motor is an aspect of development that children can master by playing with their circled material. However, this does not mean that the development of writing and reading takes place naturally without any support from adults (Beaty, 2015: 351). Children need active and regular interactions with printed and verbal languages and writings.

CONCLUSION

Early childhood learning needs to emphasize the principle of integration between play and learning, integration between mentoring and learning, as well as the relationship between the child's experience in daily life and learning. Game-based learning is very significant for brain

development and facilitating children to develop motoric strategies and skills, develop language skills and socialize with people around them, and become creative individuals in solving problems. The learning can be done by the Whole Brain Teaching method, which emphasizes the interaction between teachers and students so that learning becomes enjoyable. The main characteristic of the process is to use an instructional approach derived from an overview of neurolinguistics based on right and left-brain functions. The Whole Brain Teaching method, which is integrated with visual literacy, is able to affect the motor development and language of early childhood.

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