



The Effectiveness of Using Mind Mapping Method to Improve Child Development Assessment

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ABSTRACT: This study aims to determine the effectiveness of using mind mapping method in improving early childhood educator's skill in mastering the child development assessment. This research is quasi-experimental using a pre-test and post-test design. The population was the entire classes of early childhood education training held by LPK Yayasan Indonesia Mendidik Jaka Sampurna at Cileungsi, Bogor. The participants were 45 early childhood educators. This study used three research methods which are implemented from learning methods in child development assessment was as pre-test and post-test. Data were collected by using two instruments to measure early childhood educators for child development assessment. The data were analyzed by using t-test to measures the differences data in pre-test and post-test. The results showed that the use of mind mapping methods can help early childhood educators to improve their mastery of the development assessment concept which averages 51.9 percent. It showed significant results with t-test value is 18,266 ($N = 10, \alpha = 0,0$). This capacity building is reinforced by various qualitative findings which arise from early childhood educators' awareness to change the old learning style into learning by mind mapping method as a learning method that follows how the brain works. This study also found that early childhood educators as adults who are in the stage of formal thinking have shown an understanding that mind mapping method are appropriate, fast, easy and practical in mastering various development assessment concepts. Early childhood educators believe that they can use the method for mastering other material concepts.

Keywords: Assessment, Brain-based teaching, Mind mapping

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1 INTRODUCTION

Child development refers to sustainable, predictable biological, psychological and emotional changes that occur in humans between birth and late adolescence. The order of development is the same for all children and can be explained in terms of the development of milestones. When children develop at different levels, which are determined by the complex interactions between the environment and genetic factors, (1) the age of achievement for each range of milestones is broad. It is important not only to realize the average age of achieving milestones (i.e. the age at which half of the standard population reaches a milestone) but the age limit as good (i.e. the upper age limit at which certain milestones should have been reached). It will help doctors to convince parents/caregivers, monitor child development closely or refer children to specialists for detailed assessment and further management.

It is also important for doctors to assess the quality of skills rather than recording the age at which the milestones were achieved. For example, a child may have acquired enough language skills to allow him to speak in phrases, but he may not be skilled at using language for conversation purposes. The basic architecture of the brain is built on a continuous process that begins before birth and continues into adulthood. Maximum brain development occurs in the brain in the first three years of a child's life and hence is called the beginning of the development phase. It is important to recommend that parents engage in appropriate stimulation activities with their children, starting from the period of the newborn (Choo et al, 2019).

Assessment of child development is one of the competencies that must be mastered by educators in various early childhood education institutions. This is in line with the qualifications and competencies of early childhood educators which are confirmed in Law number 14 of 2005 concerning teachers and lecturers as well as the implementation of them in the national education minister's regulation number 16 of 2007 concerning teacher qualifications and competencies.

Assessment to support learning, the first and most important of these objectives, refers to the use of assessments to provide teachers with information that can serve as a basis for pedagogical decisions and curricula. The information presented in previous chapters on early learning about the course of episodic development in certain children and the enormous variability among young people in the background and preparation for school, about the centrality of adult responses to healthy cognitive and emotional development leads to the conclusion that what preschool teachers do to improve learning must be based on what each child brings into the interaction. An assessment that is widely understood is a set of tools for knowing this. The second reason for assessing young children is to diagnose suspected mental, physical, or emotional difficulties that may require special services. The two final objectives can be combined under the assessment rubric to make policy decisions. Each of these goals represents an important opportunity for test or assessment data to inform the assessment if the test or assessment is used carefully and well. There is no type of assessments can fulfill all of these goals; the intended purpose will determine what type of assessment is most appropriate. And there is a lot to remember about the development status of young people, including attention status and their newborn self-regulating abilities, which makes judgments more challenging than other populations (Bowman, Donovan, & Burns, 2001).

Related to the first assessment, interpretation is a dynamic assessment that requests information from various sources that are collected over time, reflected childhood experiences and interpretations of the educator or caregiver. The second assessment is formal assessment. These actions are

the first step in the process of obtaining information about children and families. Through intervention by practicing ideas or hypotheses proposed by the initial assessment procedure and more information will be obtained so that it can serve a dual purpose of perfecting assessment and improving intervention. Thirdly, the assessment has limited value without instructions or intervention. The meaning of an assessment is closely related to its usefulness and contribution in making decisions about practices or interventions or confirmation of children's continuation.

The main objectives of the assessment are to support learning and development for children and classrooms, to identify children who may need additional services, and to assist in communicating progress or obstacles with parents effectively. During the ongoing assessment, it is carried out by observing, documenting, and analyzing the abilities of children displayed in the classroom in activities when children apply their understanding and skills and integrate what they learn. Data on children's results are collected for each classroom and program to guide recipients in the ongoing improvement of the program. It also informs goal setting, ordering program materials, and planning professional staff development. Authentic assessment combines teaching, learning, and assessment to encourage thinking, learning, and full participation of higher children through all parts of the daily routine. Sustainable and authentic assessments must provide information in all domains including social and emotional development, intellectual development, language, and early literacy development, creative development, physical development, health; early learning in mathematics, science, social studies; and use of technology (NAEYC, 2003).

Guidelines when choosing and utilizing valuation methods, namely:

1. Using development and learning theories that are appropriate for planning and evaluating children and looking beyond cognitive skills to assess all children.
2. Use assessment tools and processes that are validated by reliable, cumulative, and in research that is understood by children.
3. Using children's involvement in class activities naturally, not artificially made activities, to measure children's development.
4. Documenting children's growth, development and learning over the anecdotal observations and reports, interviews of parents, providers and children; products and work samples of children; standard checklist; and children's self-assessment.
5. Involve all staff members who have regular contact with children.
6. Organize assessments in order to avoid stress for children or teachers.
7. Use the results of the assessment as a guide to curriculum and teaching decisions and the need for interventions for individuals and classrooms.
8. Use the results to determine the need for a special screening and/or intervention (NAEYC, 2003).

Almost all early childhood educators rely on some form of informal monitoring of child learning to design programs and plan curriculum, to engage in pedagogy. However, relatively few early childhood teachers systematically observe, record, evaluate, and document children's learning even though the need for systematic documentation is quickly applied in various directions, including the standard performance of new Head Start children. Teachers can learn to observe and document children's skills, knowledge and achievements as they participate in class activities and routines, interact with peers and work with educational materials. The forms of assessment embedded in the curriculum, for example, are contextual methods that allow the opportunity for children to demonstrate their knowledge or skills through active involvement in class activities (Bowman et al., 2001).

Understanding the concept and practice of assessment will provide a real picture of the teacher's competence in reviewing, finding and deciphering reports of child development appropriately, easily understood and meaningful, especially for children and parents. The quality of the process and results of the assessment also provides an overview of the quality of the learning and/or playing process that has been carried out as well as the development results obtained by each child. Thus, the mastery of children's development assessment skills becomes the needs and competencies inherent in every early childhood educator.

The assessment ability of early childhood educators includes the competency section which is rarely the material for fostering early childhood educators. Based on a preliminary study, almost all research subjects had never been trained and given material about child development assessment. The absence of training in assessment of skills is also felt by early childhood educators in different areas, both early childhood educators in formal institutions (kindergarten or Raudhatul Athfal) and non-formal institutions (Playgroups, Pos PAUD, and BKB PAUD).

Early childhood educators can conduct assessments to find out the child's development that has been achieved and not. Assessments carried out by early childhood educators can map the abilities of each child from each stage of development according to age. Educators can make appropriate efforts to help the development of children based on the results of the assessment. Educational assessment standards include attitudes, knowledge, and skills. The Minister of Education and Culture of the Republic of Indonesia in the Regulation of the Minister of Education and Culture of Indonesia Number 146, 2014 states that assessment is a process of collecting and processing information to measure the ability of children's learning outcomes. In early childhood education, it is better to know child development assessment.

Assessment can be defined as the process of gathering information about specific aspects of a child's knowledge, behavior, skill level, or personality for the purpose of making evaluative decisions (Meisels, 2001). Assessment can be done for different purposes. Screening and diagnostic tools are developed to identify and place decisions for each child. Screening is a short procedure that determines whether a child's performance is quite different from other forms of comprehensive knowledge testing. If there is suspicion of delay, the diagnostic assessment provides more in-depth information about the specific nature of the problem. For example, screening tools such as Ages and Stages of Questionnaires Bricker, D., & Squires (1999) will be provided to determine whether there is a reason to worry about the development of Sean's language. If the results of screening show a delay, in-depth assessment is the type of specific delay, strength, and needs of children, and recommendations for intervention. Assessment can also be used to identify curriculum and teaching strategies that are appropriate for each child and to document children's progress over time. For example, teachers can develop Sakara's systematic plan to document progress in attending assignments and identification that helps their teaching strategies. This type of assessment is referred to an assessment program. The assessment tool program can also be used for program evaluation purposes when comparing the group performance of children before and after teaching. For example, teachers can collect data about children's language and literacy years, before they start reading picture books, and then at the end of the year.

There are various experts provide a definition of assessment which involves processes and the technique. Assessment as a process to get information used for make decisions about students, curriculum, and programs, as well as education policy (Anthony, 2001, pp. 4–5). According to The assessment is determining the process through observation or tests on innate characteristics or someone's behavior, characteristics the program, and then set in numbers, ratings or

scores(Wortham, 2005, p. 2). Assessment can be done by making a guide observation or observation to get an assessment about child development. Teachers is involved in ongoing, strategy, and purposeful assessment and evaluation. Daily, they are active in documenting what the children in their classroom know and will need to know, the progress being made toward learning and developmental goals, and whether various aspects of their program are supporting each child growth (Kostelnik, Soderman, & Whiren, 2007, p. 166).

Child development assessment is a process that is carried out systematically to obtain information about children's abilities and development. The results of the assessment will be reports or information for teachers and parents in designing programs and needs that are appropriate to the achievement of children's development. According to Feeney, assessment authentic, namely assessment carried out during the activity learning children in life settings real and under circumstances natural(Feeney & Moravcik, 2006, p. 132). Authentic assessment can be used in various natural circumstances, for example, when children learn and play. Authentic assessment is done for measure development progress children in behavior maturity, skills, preparation stages and understanding of a concept in children. The following are some deep recording techniques observation. 1) Anecdotal Record is descriptions or depiction in writing of child behavior. 2) Running Record is another method used to record behavior children in detail described in narrative form and based on the sequence of events. 3) Time sampling is to take notes how often or to see the frequency of behavior occurs within the time period determined. 4) Event sampling used as the time sampling, for example, when a behavior tends to occur within certain time compared to happening within a period that can estimated. 5) Checklist is list of sequential behaviors that are in the inside is arranged in the system from a category. 6) The use of this technique includes activities in taking picture, using audio / video tape for various series of events (Feeney & Moravcik, 2006).

In assisting efforts to master children's development skills, this study was conducted to examine mind mapping method as an alternative to help early childhood educators master the concepts and practices of assessment. Early childhood assessments include assessments that include activities to gather information about children which are later needed to understand children correctly and to provide support in learning and development (Slentz, 2008, p. 11). The results of a study, 64.3% of kindergarten teachers in the Rawamangun Sub-District area, DKI Jakarta has learned, understood, and appraised child development appropriately. While 35.7% of teachers still have not been able to plan, implement, and report a comprehensive assessment of child development. Early childhood educators have not been able to plan learning in which there are appropriate and comprehensive development assessments. The teacher only writes results in general or sometimes not at all. There is no detailed format of assessment or instrument lattice yet to assess children. This shows that the teacher is not able to plan to record and make the development report properly (Hartati, 2012).

There are several principles that must be followed by model developers and assessment executors. The principles of early childhood assessment according to Bagnato (2007, pp. 2–6) are as follows:

1. Parents as Partner

One important part of the assessment is the role of parents. In order to get a good understanding of child development, collaboration between teachers and parents is needed

2. Developmental Appropriateness

The technique and content of the assessment must be adapted to the characteristics of the child's development.

3. Utility
Assessment must bring benefits to the development of children, needs of institutions and parents.
4. Acceptability
Objectives, techniques, and assessment instruments should be agreed upon by parents and teachers as professional staff at the field.
5. Authenticity
Assessment of child development should be carried out in a natural context in order to produce information authentic.
6. Collaboration
One important part of the assessment is the role of parents. To get a good understanding of child development, the role of parents is needed. In this regard, there must be collaboration between the teacher and parents.
7. Convergence
Convergence from several perspectives (family, professionals) provides a better information base.
8. Equity
Assessment must be able to accommodate individual differences. The principle of justice is considered and mandated as essential for teaching materials.
9. Sensitivity
Assessment implementers must be given the opportunity to carry out assessments that are able to detect the complexity of child development so that the slightest development can be identified.
10. Congruence
The assessment techniques and instruments must be in accordance with the characteristics of the child, including those who have distinctive development and those who have mild to severe defects varies.

Armstrong distinguishes management into 2 models, namely authentic assessment and standardized assessment (Armstrong, 2009, pp. 131–132). Authentic assessment including informal assistance carried out in a natural, appropriate context. Whereas standardized assessment or formal assessment, on the other hand, its implementation is almost always in artificial settings far from the real world of children. Authentic Assessment Model is an assessment model based on the real conditions that arise from the behavior of children during the process of activities and the results of these activities. Authentic assessment is carried out when children are involved in play activities, must be done naturally under conditions planned by the teacher (DIKMAS, 2015, p. 8). Authentic assessment has certain characteristics. There are six characteristics as important dimensions of authentic assessment, they are:

1. Structured recording
Authentic assessment is not a process of passively observing children's behavior but involves the use of schedules and procedures. Both of them must have been tested and validated by professionals.
2. Developmental observations
Observations for authentic assessments are based on hierarchy's functional competencies that follow the stages of the development path. Every initial competency is prerequisites for the next in order of expected or desired behavior.
3. Ongoing assessment

Authentic assessment of early childhood development takes place in a manner continuous for various times and opportunities different so that a comprehensive picture of child development can be obtained.

4. Natural competencies

One of the strengths of authentic assessment is its attention to the typical behavior of children in various daily routines that are familiar to children. Such natural behavior reflects the competencies gained or arising in recurring home and school situations.

5. Familiar people

Authentic assessment is carried out by figures close to the child, who know the characteristics and privileges of children a lot, are involved in repeated interactions with children every day, and of course, are familiar to the child.

6. Everyday routine.

Authentic assessment is based on natural situations that occur in the form, activity, and typical routines of children. This routine uses the influence of repeated cues in the physical environment and interactions with adults and peers (Bagnato, 2007).

Learning method and training for early childhood educators have not been widely used by using the mind mapping model. Mind mapping method comes from how individuals learn based on the brain works. The basic reference theory for gaining this understanding at this time is learning theory based on the work of the brain that is known as brain-based learning (Jensen, 2008, p. 12). This theory is a learning theory that optimizes brain function. If the brain does not have a disability the learning process that optimizes the brain can run normally. Eric Jensen gave a new paradigm of the teaching and learning process based on how the brain works. One of the core thoughts and conclusions of the big theory is an explanation of how the approaches, methods, and techniques of learning and learning are carried out about learning through understanding, interpreting and optimizing all functional brain capacities.

Roger Sperry has found that the brain has two hemispheres, the left hemisphere, and the right hemisphere (Lienhard, n.d.). According to Sperry, the two hemispheres of the brain work very differently. The left hemisphere thinks rationally, and the right hemisphere thinks emotionally. Sperry's finding showed that it is useful for making education more enjoyable, comfortable and able to bring out the hidden potential of students.

As a form of development of Sperry's thoughts and findings, Tony Buzan discovered a new method of recording (the meaning of remembering) called mind mapping. The new method records the way of working according to the workings of two left hemispheres and the right brain. When taking notes, you should not only use text but also use images. If necessary, enrich the note with color, because the brain is happy with the color. The shape of the note is then like a picture of a piece of neuron or nerve cell. Mind mapping method that was first designed by Buzan in 1970 was a technique based on students' understanding and interpretation. It is used to represent knowledge graphically and can help teachers explain complex structure and relationship concepts and to integrate new knowledge graphically with the existing knowledge. This is an example of a non-linear approach to learning that encourages students to think radically and uses only keywords and images that are connected non-linearly. In the mind map, only words, clauses, and important phrases are used and the note becomes a combination of images with several words (Blessing & Olufunke, 2015).

According to Buzan, T. & Buzan (1996) mind maps are expressions of brilliant thinking and, therefore, a function of the human mind which provides a universal key to unlock the potential of

the brain. He connects assimilation of graphical information with the way of the brain regulates information. This is a visual learning method that is categorized under the extended family of graph organizing tools built on a diagram. Other examples of organizing tools for the graph include concept maps, tree diagrams, organizational charts, and spider diagrams. Thomas, (2007) defines mind maps as strong graphs techniques that utilize a variety of cortical skills like words, pictures, numbers, logic, rhythm, colors and spatial awareness in one powerful way. Therefore, it provides the freedom to explore an infinite stretch of the brain.

The description of Buzan's thinking concept is in line with what was conveyed by MacGregor who revealed that mind maps are a method of making notes for thinking and are thinking skills in learning acceleration (Sandy, 1992). This gives an understanding that mind maps can be a method for someone to accelerate learning in mastering various concepts and meanings. As a method, Porter revealed that mind maps involve both the left and right hemisphere of the brain that is incorporated in a system to process words, logic, and sequences (Windura, 2013).

Mind mapping method is widely used in learning because it is brain-based so that it facilitates the process of mastering the material. The Mind Mapping method has an effect on student motivation (Jones et al., 2012) and can improve writing skills (Riswanto & Putra, 2012). The assessment carried out by early childhood educators using the observation method Bellman & Byrne (2013), there has been no research to help early childhood educators conduct assessments using the Mind Mapping method.

Mind maps record information like the brain does, like tree branches, to make it easier for individuals to remember the main points. Buzan's steps, both related to the findings of the mind mapping method and related to his provocative statements about brain awareness, can be a method of actions that need to be developed in order to train and foster learning and how to learn adults. Early childhood educators as adults need to be given the opportunity to understand and empower their brain functions in increasing their capacity to carry out professional tasks.

Wycoff, (1991) broadens the understanding and the use of the mind map method to broader fields. Wycoff tried to develop the application of the Buzan concept into a learning strategy using the following steps:

1. Effectively understand the learning material;
2. Make interesting and colorful presentations;
3. Choose a theme that is focused on writing;
4. Write reports that can grab the attention of readers;
5. Effectively detailing personal agendas, such as daily schedules, telephone listings, and so on

Mind mapping consists of imaginative ways of registering ideas and are effective and useful recording methods in idea generation by associations (Buzan, 1974; Goel & N. Singh, 1998). The author argues that the normal linear method for recording ideas does not use the brain efficiently so that it develops a mind map which is a dynamic way to record information. Mind maps consist of main ideas which are summarized as central images or word phrases. From the central idea, it emits the main theme of the subject as a branch. Branches consist of keywords, images or topics that are presented in related lines and they are divided into higher level sub-branches. The branches usually decrease in size and thickness which means that they are thick in the middle and finer towards the periphery. Small branches of the inner branch radiate to a much larger outer branch. To help the memory process and remember, mind maps utilize appropriate visual images which are useful for describing various themes and topics (Buzan, T. & Buzan, 1996). In addition,

several different colors are used to distinguish areas of mind maps and help to divide different categories. The map represents the team's mental model and it will represent group ideas that help create a big picture of everything the group wants to put in. Mind maps highlight the use of artistic and textual instructions to help the organization of ideas generated by the group. The main steps that must be followed to make a mind map are:

1. Start in the middle of a blank page with the main idea to give freedom to spread in all directions in a free and natural way.
2. Use words, pictures or images for a central idea. However, central images are more interesting and give the brain more buzz.
3. Use color to excite the brain because color adds extra spirit and life to the mind map and adds energy to the creative thinking process.
4. Connect the main branch to the central idea and connect the branches to the first and second levels. The brain works through associations, connecting various things together. Linking branches helps to better understand and remember the path.
5. Curved to provide a more flexible mind map and use images if they are deemed appropriate.

The mind mapping method model is a set of concepts that give an idea of how learning and learning are based on the workings of the mind. This model can be used by various ages, especially adults in mastering various concepts when studying in training or lectures. The learning process in adults is often influenced by various factors so it is very possible to master the concept of being weak and easily forgotten. To overcome this, the mind mapping model can be used as an appropriate model, especially for early childhood educators in mastering the concepts and practices of early childhood development assessment.

Using mind maps, it is possible for early childhood educators to use and empower the potential thinking power to map and understand several concepts and practice flows of child development assessment. Early childhood educators can use writing lines that describe concept maps in the mind that can be given symbols or signs to make it easier to remember. Early childhood educators can map a number of core concepts, basic and meaningful according to the way of the thinking process.

2 METHODS

This research is quasi-experimental research using nonequivalent control-group design (Gall, Gall, & Borg, 2007). The quasi-experimental design used in this research is a pre-test and post-test design. The population research was the entire classes in early childhood education training participants held by LPK Yayasan Indonesia Mendidik Jaka Sampurna at Cileungsi, Bogor, in 2014. The participants were 45 early childhood educators. The sample of this research was taken randomly purposive from participants in the early childhood education course. The data collected consists of learning implementation mind mapping method data. Learning implementation data were obtained from the test that measures the ability of child development assessment by early childhood educators.

3 RESULTS AND DISCUSSION

The results of this study can be illustrated by the pre-model development assessment skills score data with the lowest score achieved is 4 and the highest score is 20. From the distribution of scores obtained the mean of 6.7, the median of 6.9 and mode 6. The data shows that the average achievement of the development assessment mastery is still very low, even in qualitative measures it can be categorized as not yet seen the mastery of early childhood educators' assessment. There is only one participant who has an initial picture of an understanding of assessment that is quite good because he has worked in a company and is familiar with the employee assessment process.

Table 1. Pre-test Scores

Data	Pre-test Scores
Mean	6.7
Median	6.9
Mode	6.0
Lowest Score	4.0
Highest Score	20

Table 2. Post-test Scores

Data	Pre-test Scores
Mean	15.54
Median	15.26
Mode	15.00

Table 3. Difference Pre-test and Post-test Scores

Data	Pre-test Scores	Post-test scores
Mean	6.7	15.54
Median	6.9	15.26
Mode	6.0	15.00
Lowest Score	4.0	
Highest Score	20	

Mastery score data on post-test of early childhood educators obtained a mean score of 15.54, the median of 15.26 and mode 15. The data provided an overview of the mastery of developmental assessment skills after early childhood educators tried to use mind mapping method. The use of mind mapping method helps early childhood educators learn to understand a concept by using potential mind maps. The data of child development assesment mastery result in pre-model activities and post-use method can be described the comparison of scores and percentage increases for each subject of the study. Based on these data it can be concluded that there was an increase of an average of 51.9% of early childhood educators' child development assesment mastery of pre-method compared to post-use method. The results of the test analysis of the mean differences

between the two results obtained the results of t count of 18.266 ($N = 11$, $df = 10$ and $\alpha = 0.00$). The results of the t-test showed that there was a significant increase in mastery of child development assessment in early childhood educators after following the use of mind mapping method.

The research findings illustrate that mind mapping method can be considered as one of the appropriate and practical learning and learning method for early childhood educators as adults. At the cognitive level (formal thinking ability), adults (early childhood educators) can reflect on learning mistakes that have been done previously, especially when following previous formal education levels (elementary to high school). Early childhood educators can find out for themselves the various mistakes in their learning process and find out for themselves the right way to update the way of learning. When they are given a little enlightenment about how to master the concept by using mind mapping method, they try in groups to learn, understand and use.

Early Childhood educators generally recognize that memorizing is a wrong, ineffective and easily forgotten way. They tried to use the mind map model as a new way of mastering concepts in child development assessment training material. When they succeeded in using the mind map model, they grew the belief that this model became the choice of a suitable model not only because it fits the way the brain works but they feel suitable, easy and practical as a way of learning adults. Through the use of mind mapping method, early childhood educators can imagine the flow of knowledge, the place to store and the basic description of that knowledge.

The early childhood educator learning strategy that uses the mind map method begins with examining the focus of the discussion, evaluating how to study with the old model, understanding the way the brain works in mind maps, drawing draft illustrations of mind maps and developing draft mind maps along with help of visuals, colors, and images. In the early stages, early childhood educators were given an orientation on the focus of mastery of concepts in child development assessments. The discussion of this focus is important as an effort to recall variously related knowledge or intersect with the knowledge in question. In the next stage, early childhood educators are invited to recognize the mind map model and its relation to the way the brain works. At this stage, early childhood educators also get a way to use mind maps to master the development assessment concept. In the third stage, early childhood educators try to reflect on their own main ideas from the assessment concept into the map of mind maps on folio paper. They try to make a flow of mind maps that illustrate how concept maps work. In the final strategy, early childhood educators illustrate mind maps with the concept of assessment by helping meaningful words, visual images, colors and flow (schema).

The mind mapping method is one of the learning options that can be used by adults (early childhood educators) who are in the development of cognitive levels of formal thinking. Early childhood educators can receive, search, organize/store and store and reproduce various knowledge (factual, concepts, procedures and metacognitive) through the use of mind maps. In addition, early childhood educators who are at the level of formal thinking are able to reflect on weaknesses and mistakes in the old ways they learn. The process is closely related to reasoning abilities possessed by early childhood educators as individuals who are at the stage of formal thinking (Thornton, 2008, p. 226). The use of a mind map model helps early childhood educators make mastery of concepts more meaningful. The meaning of the concept in the early childhood educator mind map model is accompanied by display concepts, concept sequences and concept marks with color. The excitement of the process is a means for early childhood educators to build

concepts and understandings that are meaningful and also come from initiatives and the way their brains work (Jensen, 2008).

The Mind mapping method is more effectively used in the learning process. The results of the study state that the mind mapping method is more effectively used compared to conventional methods. This implies that the mind mapping method has the capacity to help students associate ideas, think creatively, and make connections that may not be conventionally achieved by taking notes. Therefore, the results of this study conclude that the mind mapping method is one of the effective learning strategies that can be used by teachers to overcome many of the problems encountered in the learning process and to improve the output of students (Blessing & Olufunke, 2015).

Another study stated that students view the mind mapping method as an effective strategy in helping them write. Mind mapping methods can improve students' writing skills. Thus, the mind mapping method is an effective tool to help students plan and organize their writing by encouraging students to get a comprehensive and in-depth understanding of the topic of writing. Students who have inadequate drawing skills take a long time to make mind mapping because they are usually more focused on making effective mind maps with good visual aids without an estimated time to make a good writing product. However, this weakness can be overcome by the teacher giving clear instructions to remove student doubts and a limited time frame for students to make mind maps more efficiently (Yunus & Chien, 2016).

Assessment of early childhood development differs in characteristics from advanced classroom assessment. The development of early childhood is very fast, so an assessment is needed to find out whether the child is developing well (Suyadi, 2017). In carrying out an assessment of early childhood development, careful planning is needed by using techniques and instruments (tools) that precisely measure the object. Teachers are very important to have the ability to assess children's development. The mind mapping method can make it easier for teachers to assess their students.

Mind mapping method is an effective strategy to help writing activities. The assessment carried out by the teacher is an inseparable part of writing activities (Yunus & Chien, 2016). So that the mind mapping method can be used effectively to assist in planning and organizing comprehensive assessment results. By using the mind mapping method, the teacher can map the aspects of the assessment that will be carried out by the teacher towards the students, making it easier for teachers in the assessment process.

4 CONCLUSIONS

The use of mind mapping method has helped early childhood educators as adults who are at the level of formal thinking reflect on how to learn effectively. The results of these reflections led to a process of reasoning that all time they used many ways of learning is wrong, monotonous, and inefficient. This result is also the basis for early childhood educators in using the mind map model.

The use of this model has helped early childhood educators to improve their mastery in the development assessment concept which sought an average of 51.9 percent. This capacity building is reinforced by various qualitative findings which are shown by the early emergence of awareness of early childhood educators to change the old model (style) in learning towards using mind mapping as learning method that follow how the brain works. This study also found that early

childhood educators as adults who are in the stage of formal thinking have shown an understanding that mind map method are appropriate, fast, easy and practical learning method in mastering various development assessment concepts. Early childhood educators believe that they can use the model for mastering other material concepts. The early childhood educator learning strategy that uses the mind mapping begins with examining the focus of the discussion, evaluating how to study with the old model, understanding the way the brain works in mind maps, drawing draft illustrations of mind maps and developing draft mind maps with the help of visuals, colors, and images. In the early stages, early childhood educators were given an orientation on the focus of mastery of concepts in child development assessments. The discussion of this focus on the important as an effort to recall variously related knowledge or intersect with the knowledge in question. In the next stage, early childhood educators are invited to recognize the mind map model and its relation to the way the brain works. At this stage, early childhood educators also get a way to use mind maps to master the development assessment concept. In the third stage, early childhood educators try to harness their own main ideas from the assessment concept into scribbled mind maps on folio paper. They try to make a flow of mind maps that illustrate how concept maps work. In the final strategy, early childhood educators illustrate mind maps with the concept of assessment by helping meaningful words, visual images, colors and flow (schema).

The mind mapping method helps organize existing knowledge and ideas. It started from a generic idea at the center, through increasing specificity at the extreme outside. By presenting ideas in different colors and with visual stimuli, it helps trigger learning and understanding. The mind mapping method is not inherently structured with the goals and action-oriented but helps to identify factors related to a topic without focus on results. Mind mapping methods have the benefit of stimulating creative thinking. Students can see actively by studying the potential of the mapping method, and how to help graphical representation in the steps of making ideas. The mind mapping method is very helpful in accelerating learning and the ability to remember information by surrounding a central idea with a network of related ideas that emanate.

5 REFERENCES.

- Anthony, J. N. (2001). *Educational Assessment of Student*. New Jersey: Merrill Prentice Hall.
- Armstrong, T. (2009). *Multiples Intelligences in the Classroom*. Virginia: SCD.
- Bagnato, S. J. (2007). *Authentic Assessment for Early Childhood Intervention*. New York: The Guilford Press.
- Bellman, M., & Byrne, O. (2013). Developmental assessment of children, (January), 4–9. <https://doi.org/10.1136/bmj.e8687>
- Blessing, O. O., & Olufunke, B. T. (2015). Comparative Effect of Mastery Learning and Mind Mapping Approaches in Improving Secondary School Students' Learning Outcomes in Physics. *Science Journal of Education*, 3(4), 78–84.
- Bowman, B. T., Donovan, M. S., & Burns, M. S. (2001). *Eager to Learn. Eager to Learn*. Washington DC: National Academy Press. <https://doi.org/10.17226/9745>
- Bricker, D., & Squires, J. (1999). *Ages and stages questionnaires: A parent completed, child-monitoring system* (2nd editio). Baltimore, MD: Brookes Publishing.
- Buzan, T. & Buzan, B. (1996). *The mind map book: How to use radiant thinking to maximize your brain's untapped potential*. New York: Plume.
- Buzan, T. (1974). *Use Your Head. Innovative Learning and Thinking Techniques to Fulfil Your Mental Potential*. BBC books.
- Choo, Y. Y., Yeleswarapu, S. P., How, C. H., & Agarwal, P. (2019). Developmental assessment: practice tips for primary care physicians. *Singapore Medical Journal*, 60(2), 57–62. <https://doi.org/10.11622/smedj.2019016>
- DIKMAS, D. (2015). *Pedoman Penilaian Hasil Pembelajaran*. Jakarta, Indonesia.
- Feeney, S. D. C., & Moravcik, E. (2006). *Who Am I in The Live Of Children*. New Jersey: Pearson Merrill Prentice Hall.
- Gall, M. D., Gall, J. P., & Borg, W. R. (2007). *Educational Research: An Introduction* (4th ed.). New York: Longman Inc.
- Goel, P. S., & N. Singh. (1998). Creativity and innovation in durable product development. *Computers & Industrial Engineering*, 35(1–2), 5–8. [https://doi.org/http://dx.doi.org/10.1016/S0360-8352\(98\)00006-0](https://doi.org/http://dx.doi.org/10.1016/S0360-8352(98)00006-0)
- Hartati, S. (2012). *Tingkat Pengetahuan Guru TK tentang Asesmen Perkembangan Anak Usia Dini di TK Kelurahan Rawamangun, DKI Jakarta*. Jakarta.
- Indonesia, D. P. dan K. Menteri Pendidikan dan Kebudayaan, Pub. L. No. No. 146 (2014). Indonesia.
- Jensen, E. (2008). *Brain-Based Learning. Pembelajaran Berbasis Kemampuan Otak*. Yogyakarta: Pustaka Pelajar.
- Jones, B. D., Ruff, C., Tech, V., Snyder, J. D., Tech, V., Petrich, B., ... Koonce, C. (2012). The Effects of Mind Mapping Activities on Students' Motivation. *International Journal for the Scholarship of Teaching and Learning*, 6(1).
- Kostelnik, M. J., Soderman, A. K., & Whiren, A. P. (2007). *Developmentally Appropriate Curriculum, Best Practice In Early Childhood Education*. New Jersey: Pearson Education Inc.
- Lienhard, D. A. (n.d.). Roger Sperry's Split Brain Experiments (1959–1968). *The Embryo Project Encyclopedia*.
- Meisels, S. J. (2001). Fusing assessment and intervention: Changing parents' and providers' views of young children. *ZERO TO THREE*, 4–10.

- NAEYC. (2003). *Early Childhood Curriculum, Assessment, and Program Evaluation*.
- Riswanto, & Putra, P. P. (2012). The Use of Mind Mapping Strategy in the Teaching of Writing at SMAN 3 Bengkulu , Indonesia. *International Journal of Humanities and Social Science*, 2(21), 60–68.
- Sandy, M. G. (1992). *Pice of Mind*. Jakarta: Gramedia Pustaka Utama.
- Slentz, K. L. (2008). *A Guide to Assessment in Early Childhood*. Washington: Washington State.
- Suyadi, S. (2017). Perencanaan dan Asesmen Perkembangan Pada Anak Usia Dini. *Golden Age: Jurnal Ilmiah Tumbuh Kembang Anak Usia Dini*, 1(1), 65–74. Retrieved from <http://ejournal.uin-suka.ac.id/tarbiyah/index.php/goldenage/article/view/1251>
- Thomas, H. S. (2007). *Today's topics on creativity engineering system division*. Massachusetts.
- Thornton, S. (2008). *Understanding Human Development*. New York: Palgrave, Macmillan.
- Windura, S. (2013). *Mind Map Langkah Demi Langkah*. Jakarta: Elex Media Computindo.
- Wortham, S. C. (2005). *Assesment in Early Childhood Education*. New Jersey: Pearson.
- Wycoff, J. (1991). *Mindmapping: Your Personal Guide to Exploring Creativity and Problem-Solving*. Berkley; Reissue edition.
- Yunus, M. M., & Chien, C. H. (2016). The Use of Mind Mapping Strategy in Malaysian University English Test (MUET) Writing. *Creative Education*, 76, 619–662.