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## The Effect of Teacher Competency Training on High Order Thinking-Based Learning

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### Abstrak

Pembelajaran berbasis *High Order Thinking (HOT)* di lembaga PAUD mampu meningkatkan keenam aspek perkembangan pada anak usia dini. Berdasarkan observasi awal, fenomena yang terjadi di lingkungan pendidikan anak usia dini (PAUD) banyak ditemukan bahwa rendahnya kemampuan guru dalam melaksanakan pembelajaran berbasis HOT pada anak usia dini. Hal ini disebabkan kurangnya pengetahuan guru dan minimnya pelatihan dalam meningkatkan kompetensi guru. Maka dari itu peneliti melakukan perlakuan dengan memberikan pelatihan peningkatan kompetensi guru dalam pembelajaran HOT. Sasaran dari kegiatan ini yaitu guru TK dan SD awal di Kota Selong Provinsi Nusa Tenggara Barat yang berjumlah 50 orang. Tujuan dari penelitian ini adalah untuk mengukur pengaruh pelatihan pengembangan kompetensi guru terhadap peningkatan pembelajaran berbasis *high order thinking* di Kota Selong Lombok Timur. Hasil menunjukkan bahwa nilai t-hitung (8,257) > t-tabel (7,745), artinya pelatihan peningkatan kompetensi guru berpengaruh signifikan terhadap peningkatan HOTS baik pengetahuan maupun implementasi guru TK Se Kota Selong.

**Kata Kunci** : *anak usia dini, HOT, implementasi, kompetensi guru, pembelajaran*

### Abstract

High order thinking (HOT) -based learning in Early Childhood Education Institution (ECEI) could improve six developmental aspects of preschool-aged children. The preliminary study revealed that the ECE teachers' ability to conduct HOT-based learning of preschool-aged children was low. This surprising phenomenon was caused by teachers' lack of knowledge and minimum training for improving the teachers' competency. Thus, we conducted a study by holding training on the improvement of teacher's competency in HOT learning. The present study involved sixty participants comprising Kindergarten and elementary school teachers in Selong City, West Nusa Tenggara Province. The present study was aimed at measuring the effect of teacher's competency development training on the improvement of HOT-based learning activities in Kota Selong, East Lombok. The result of the study indicated that the t-count (8.257) > t-table (7.745), meaning that the teacher's competency improvement training significantly affects the improvement of HOTS on both knowledge and implementation of Kindergarten teachers in Kota Selong.

**Keywords** : *preschool-aged children, HOT, implementation, teachers' competency, learning*

## INTRODUCTION

Preschool-aged children are in their golden age phase, where they experience rapid growth and development in 0-6 six years old. Treatments and education should be provided intensively and maximally to optimize a child's aptitude and competency. To support this process, a competent teacher is required. A teacher should understand the competence he or she should possess. Understanding of competency becomes a basis for an early childhood education (ECE) teacher to develop his or her capacity. Good competence will result in a good student (Sandberg & Vuorinen, 2007).

Teacher's competency holds an important role in achieving a classroom learning purpose and effectiveness. Studies on ECE quality clearly point that a teacher's competence is one of the primary factors affecting the learning implementation quality at school and is the determinant of a school's quality (National Association for the Education of Young Children, 2006). Teacher's competency could comprise several aspects such as pedagogical, professional, social, and cultural competency, among others (Katane et al., 2006). Furthermore, Selvi (2010) states that a teacher should possess seven competencies to be a professional teacher. Those are field competence, research competence, curriculum competence, social-cultural competence, emotional competence, communication competence, IT competence, environmental competence, and life-long learning competence. Good teacher's competence mastery becomes one of the indicators determining the learning success, human resources development at school, and the school's success in improving human resources (Niemi & Ritva, 2006).

A vital aspect of competency is knowledge and understanding of the material or pedagogical approach, problem-oriented, and social aspect/ learning attitude-oriented (Johansson, 2003; Pramling & Pramling, 2011; Sheridan, 2001, 2009; Sylva et al., 2010). There is a positive relationship between a teacher's quality and the education quality, teacher's quality and the students' quality, teacher's quality and teaching creativity, meaning that the higher the teacher's quality, the better the education that is provided (Lobman et al., 2005; Tout et al., 2005). Thus, the teacher's ways of carrying out his or her professional task clearly affect the children in ECE. Accordingly, it is important to improve the teacher's competence through a number of attempts; one of them is through training.

Improving teacher's competency could be done using various attempts involving a number of parties such as the government (through its education agency), private parties, universities, and the school itself. Teacher competency could be improved through various attempts such as education and training (Aziz & Akhtar, 2014; Febrianis et al., 2014) and lesson study (Aimah et al., 2017). The training material could be adjusted to the participants' needs based on their field of study. Training may result in a significant effect on the teachers' competency (Awang et al., 2013; Pujiastuti et al., 2012; Widoyoko & Rinawati, 2012). They report that the teacher's competency improvement could be seen from the result of classroom learning implementation, where the teachers become more interactive, communicative, and creative in teaching, thus enhancing the students' learning motivation and interest. Training that is not done based on the participants' need does not significantly improve the teachers' competency, besides, it may waste the teachers' time, energy, and money (Darling-Hammond, 2006).

Teachers' competency development programs should be systematic and accurate. Accordingly, need analysis is required to determine the theme of the training. The preliminary study revealed that the ECE teachers' knowledge of preschool-aged children was low. It could be seen from their curriculum design (Daily Lesson Plan, Annual Plan, Semester Plan) that is not based on HOTS concept and adversely influence its learning implementation. HOTS was not implemented because of teachers' lack of knowledge and minimum training for improving the teachers' competency. Whereas the ECE teachers should meet the criteria of ECE teachers' competency stated in the Regulation of Ministry of Education and Culture (Permendikbud) no. 137 of 2014 concerning National Standard for Early Childhood Education Department.

Teachers' low quality occurs due to the gap of education existing in the region outside Java island. Schools in Java are far more superior regarding their curriculum, teachers' quality, and facilities than that of outside Java island. Lombok is one of the regions where education is still isolated. Based on

the result of the interview and observation, it was found that there are many inadequate learning facilities. This occurs because the teachers have not had a good understanding of teachers' competency standards, in addition to teachers' welfare, which is also not well-treated. Most of the teachers in this area are not graduated from the education/ teacher training field. This condition leads to suboptimal learning activities. Their low economy makes it difficult to select or to create learning media. Besides, the students' parents also do not have an adequate understanding of ECE.

High-Order Thinking Skills (HOTS) refers to a process that requires a child to manipulate information and ideas in a certain way in order to generate new understanding and implication (Heong et al., 2011). Ample research findings show that the HOTS-based learning process positively influences the students' learning achievement (Heong et al., 2011). However, it is interesting to study the best practices in the HOTS-based learning process. A study conducted by Anderson et al. (2001), investigate the Bloom's taxonomy using HOTS, which results in six steps, namely: remembering, understanding, implementing, analyzing, evaluating, and creating process. They propose these six steps to develop HOTS, emphasizing analysis, evaluation, and creation. The implication is that the teachers should teach analysis using an approach that integrates concepts or understanding, organizes, associates one concept with other concepts (Yunos et al., 2010; Zohar & Dori, 2003). Evaluation technique in the HOTS-based approach consists of coordinating, detecting, monitoring, testing, criticizing, or assessing (Anderson et al., 2001).

Implementing HOTS in ECE may improve six aspects of preschool-aged children's development. HOTS-based learning activities could be the basis for children to achieve autonomy, creativity, and critical thinking in addressing real problems in their surroundings (Fisher-Maltese & Zimmerman, 2015; Mustam & Daniel, 2016). HOTS concept in preschool-aged learning activities consists of remembering, understanding, applying, analyzing, evaluating, and creating. The implementation of this concept is grounded on the children's characteristics who possess strong memory and thinking ability. Implementing the HOTS concept may enhance the individual's critical thinking, creative thinking, and problem-solving skills (Quieng et al., 2015). Considering the importance of critical and creative thinking, ECE should be carried out based on the HOTS concept (Sharif & Cho, 2015; Talmi et al., 2018).

Based on the description mentioned earlier, we conducted a study on the effect of competency improvement training on the knowledge and implementation of HOTS-based learning in Early Childhood Education in Kota Selong, East Lombok. The present work involved kindergarten and elementary school teachers in Kota Selong. Such training is still scarce in this region. One of the training materials is HOTS on preschool-aged children. The present study aims to find out the effect of competency development training on kindergarten teachers' knowledge and implementation of HOTS-based learning activities for preschool-aged children in Kota Selong, East Lombok.

## METHOD

The present study was categorized as an experimental study. This experimental study applied the pre-experimental design. This is categorized as a true experimental study since there were still external variables influencing the dependent variables. The present study was conducted using the following procedure, 1) analyzing the problems and needs, 2) determining the training material and method, 3) collecting pretest data/participants' initial skill, 4) Organizing the training, 5) collecting posttest data, 6) implementing the training result in classroom teaching-learning activities, 7) processing the data and drawing conclusions. The population of the present study involved all kindergarten teachers in Kota Selong, East Lombok (n= 346). Fifty samples were taken based on their cluster. The selected participants represented their area in Kota Selong, East Lombok.

The data of the study were quantitatively analyzed using some tests, namely 1) validity test using Pearson's product-moment; 2) reliability test using Cronbach's alpha; 3) Normality test using Kolmogorov-Smirnov test, and 4) Hypothesis test using t-test where the average score of knowledge and implementation before and after the training was given was compared.

## RESULT AND DISCUSSION

Cronbach's Alpha formula was applied to test the reliability of the instrument, where the instrument was considered reliable if it exhibited a score of  $> 0.60$ . The validity test was done using Pearson Correlation Product Moment, where it was considered valid if the  $r_{count} > r_{table}$  value with a significance level of 0.05 (5%), or  $P > 0.05$ . The validity test was done using pretest data. The test result is as follow:

The validity test result showed that the  $r_{count}$  for knowledge and implementation of HOTS was greater than 0.300, meaning that all items of the instrument were considered valid. Further, based on the reliability test, the Cronbach's alpha for knowledge and implementation of HOTS was in the range of 0.812-0.873 and 0.839-0.912, respectively. Both instruments were considered reliable since their score was greater than 0.60. Table 1 below shows the descriptive analysis of the pretest result.

**Table 1. Descriptive Analysis of the pretest result**

No	range	Category	Pretest			
			Knowledge of HOTS		Implementation of HOTS	
			Total	Percentage	Total	Percentage
1	86-104)	Very High	2	7%	3	10%
2	66-85)	High	6	20%	5	17%
3	46-65)	Low	15	50%	16	53%
4	26-45)	Very Low	7	23%	6	20%
Total			30	100%	30	100%
Average			63.66		64.5	
The highest			94		96	
The lowest			32		36	
Standard deviation			7.56		7.12	

As shown in the table above, the majority of kindergarten teachers' knowledge and implementation of HOTS in Kota Selong was categorized as low (50% and 53%, respectively). The score of teachers' knowledge of HOTS (63.66) was categorized as low since it was in the score range of 46-65. The mean score of the implementation of HOTS was also categorized as low since it was 64.5. Table 2 below shows the descriptive analysis of the posttest result.

**Table 2. Descriptive Analysis of Posttest**

No	range	Category	Posttest			
			Knowledge of HOTS		Implementation of HOTS	
			Total	Percentage	Total	Percentage
1	86-104)	Very High	10	33%	11	37%
2	66-85)	High	18	60%	17	57%
3	46-65)	Low	2	7%	2	7%
4	26-45)	Very Low	0	0%	0	0%
Total			30	100%	30	100%
Average			84.46		84.32	
The highest			98		100	
The lowest			56		62	

As shown in the table above, the majority of kindergarten teachers' knowledge and implementation of HOTS in Kota Selong was categorized as High (60% and 57%, respectively). The score of teachers' knowledge of HOTS (84.46) was categorized as very high since it was in the score range of 66-85. The mean score of the implementation of HOTS was also categorized as low since it was 84.32.

The next analysis was the data normality test. The present study applied the One-Sample Kolmogorov-Smirnov test. The data distribution was considered normal if its significance level was greater than 5%. The Z score of Pretest data on knowledge of HOTS was 0.984 with significance value of  $0.487 > \text{Asymp. sig. (2-Tailed)}$  of 0.05. The Z score of the Pretest implementation of HOTS was 0.871 with a significance value of  $0.388 > \text{Asymp. sig. (2-tailed)}$  of 0.05. To conclude, the data were distributed normally.

Once the data distribution was considered normal, the hypothesis testing was conducted by comparing the knowledge and implementation of HOTS before and after the training was conducted, the present study applied paired sample t-test. The result of the t-test is shown in table 3.

**Table 3. T-test Result**

Variable	t-test for Equality of Means			Description
	t-count	t-table	sig. (2-tailed)	
Knowledge of HOTS	8.257	2.021	0,000	Significant
Implementation of HOTS	7.745	2.021	0,000	Significant

Based on the result of the paired sample t-test, it was found that the tcount of knowledge of HOTS was 8257, while the t-table was 2.201. Since  $tcount > ttable$ , in addition to the significance value of  $0.000 < 0.05$ ,  $H_1$  was rejected. In other words, there is a significant difference in knowledge of HOTS before and after the training was conducted.

Based on the result of the paired sample t-test, it was found that the tcount of implementation of HOTS was 8257, while the t-table was 7.745. Since  $tcount > ttable$ , in addition to the significance value of  $0.000 < 0.05$ ,  $H_1$  was rejected. In other words, there is a significant difference in the implementation of HOTS before and after the training was conducted.

This result indicates that a teacher's competency improvement training was able to enhance the teachers' knowledge, which, in turn, improve the learning implementation. This could be seen from the t-test result showing that the value was significant. Educational training is a set of programs containing practical methods and material delivery, where the result is applicable for learning activities. Other studies also found that an effective, planned training that suits the teachers' needs is capable of improving the teachers' competency (Awang et al., 2013; Pujiastuti et al., 2012; Widoyoko & Rinawati, 2012). In the present study, the methods applied during the training were presentation, simulation, and lesson study. By combining these methods, the training managed to improve the teachers' knowledge and implementation. The competency that was developed in training emphasized more on HOTS-related pedagogical competency. It emerges as the teachers' most important competency since it directly relates to the learning activities at school (Johansson, 2003; Pramling & Pramling, 2011; Sheridan, 2001, 2009; Sylva et al., 2010). Training that is not done based on the participants' need does not significantly improve the teachers' competency, besides, it may waste the teachers' time, energy, and money (Darling-Hammond, 2006).

## CONCLUSION

Competency improvement training significantly affects kindergarten teachers' knowledge of HOTS in Kota Selong. This improvement was indicated by a significant difference between pretest and posttest results and significance level. Furthermore, competency improvement training significantly affects kindergarten teachers' implementation of HOTS in Kota Selong. This

improvement was indicated by a significant difference between the difference between pretest and posttest results and significance level.

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