High Order Thinking Skill and Literacy Base Technological Pedagogical Content Knowledge (TPACK) in Order to Improve Students Learning Quality of in Job Primary School Teacher's Professional Educational Program

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Abstract: Quality of learning by teachers nowadays, have not became a serious focus of interest. As the result, the quality of the graduate student is at low rate. The purpose of this research is to develop and apply *Technology Pedagogical Content Knowledge* (TPACK) for the Injob Primary School Professional Educational Teacher Program (PPG in position). The methods applied on the study were combination of qualitative and quantitative and R&D by 4D outline modification, they are; define, design, develop, and disseminate. The subjects of the study are 42 students of The Student of the Injob Teacher of Professional Educational Program which divided into two class of control and experiments each within 21 students. The result of the study is a TPACK model base on literacy and high order thinking skill with significance of the pretest and posttest achievement at 0.001, which indicates that literacy base TPACK model and high order thinking skill effects to the quality of the Injob Teacher Professional Educational Program learning as the student experience Literacy base TPACK model and high order thinking skill learning.

Keyword: technology pedagogical content knowledge, literacy, high order thinking skill, learning quality, students of the Injob Teacher Professional Educational Program.

1. Preliminary

Learning quality is one of components of the new paradigm of Indonesia's higher education management which vital to be acquired by a teacher or a teacher candidate. The paradigm contains initial attribute, they are; relevant to people's need and the graduate employee, having academic atmosphere at the department program implementation, and the availability of institutional commitment of the leaders and staffs toward an effective and productive organization management, the department sustainability, as well as an efficiency of selective programs based on proper and availability. Those dimensions giving strategic levels and functions in designing and developing an excellence oriented educational program for the future. Learning quality identical to how an individual carry out learning compatible to the learning material and students' characteristic (Seknum, 2014). However, in 4.0 industrial revolution era, a

teacher must not only delivers course based only curricula but he/she must also develop literacy and high order thinking skills (Muhali, 2018)

Traditionally, literacy means competencies of applying language for reading, writing, listening, and speaking. On today's terms, literacy refers to reading and writing competencies in an appropriate level to communicate in a literate community (Hartati, 2016). Literacy believed by people of advanced countries as vital needs for every human being as world society that rapidly mobile. In 2003, the UN held conference in Praha to discuss literacy intelligence considering the importance of literacy for the world society as the vast growing of information technology. According to Ferguson (in Hartati,2016) some components of literacy process needs to be given attention at school, particularly, at the elementary level. Those components are: (1) basic literacy; (2) library literacy, (3) media literacy, (4) visual literacy, and (5) technology literacy. As Indonesian, we hope to become world's society, means the five components must be applied in our educational life at school and education ecosystem.

Student's literacy skill has strong association with high order thinking or as we known as HOTS (High Order Thinking Skill). High order thinking skill is not only ability to think by memorizing only. It requires other higher skill, such as analytic, synthetic, and evaluate. High order thinking skill emerge as an individual receive new information where the information post into memories and the information is being associated to one an another in order to achieve goals or found answers which make possible to solve a puzzling situation. Therefore, as teacher as educator as well as student's facilitator must have competencies in delivering literacy base learning and high order thinking skill to develop students' competencies in high order thinking skill as well as literacy skill.

Indonesian students' evaluation result, as described by Sajidan (2018) indicates that Indonesian students have a poor and low literacy skill in critical thinking and problem solving. It considered as the lowest students literacy skill in the world. According to PISA survey in 2015, describes that students in Indonesia is not carefully in reading given information , and they are unable to verify any logical information based on scientific evidences. Considering the case, any teacher and teacher candidate must seriously take the case into action. Teacher as educator must improve educational quality by any courses, one of them by improving learning, providing learning materials, and proper facilities. Teacher were demanded to have knowledge about how to delivers a course to students by integrating contents with curricula based on learning the students characteristic which known *as pedagogical content knowledge*.

Entering the 21st centuries, marked by massive technology of information, by challenge, one of required skill by a professional teacher is ICT and high order thinking skill implementation. Both skills, considered as fundamental skills in the upcoming 21st centuries, (Henriksen, 2016). In order to answer the challenges, a significance theoretical frame in applying information and communication technology by teacher was developed from Pedagogical Content Knowledge (PCK) is called Technological Pedagogical Content Knowledge (TPACK). The ideas of TPACK focused on how technology was made specially in order to meet the needs of pedagogic in providing the

appropriate teaching content of certain konteks (Koehler&Mishra, 2009). Every elements of knowledge portrays a needs and the importance of the aspects in teaching. However, for an effective learning requires more than every parts of the elements. As for teacher with TPACK, knowledge technology, pedagogic, and dissynthetic content and were used in designing students' learning experience (Koehler, Mishra, Ackaoglu, & Rosenberg, 2013). Therefore, one of the solutions of the problem is by applying literacy based TPACK model and high order thinking skill so the teacher may create a quality learning which requires students to master literacy skill and high order thinking skill. Quality must be apply as dimensional criteria which functioning as indicators in professional development, either one associated with the educational institution employment or as class room learning activities.

However, in reality, as revealed by the initial study, teacher or educator candidates still unable to perform certain series of required standard competencies. It was demonstrate by already infield teacher whom likely confused every time they were facing learning which requires technology and students high order thinking. Therefore, literacy base TPACK and high order thinking skill will improve a teacher's learning quality and emphasize on how teacher integrates technology in their teaching practice, rather than emphasizing on what teacher integrates on their teaching practices.

The aim of the study is to develop and apply literacy base TPACK and high order thinking skill as well as to find out the effect of literacy base TPACK and high order thinking skill toward the injob PPG Students as candidates of teacher in implementing learning. The subjects of the study were 21 students of injob teacher PPG SD. The research implemented by using a specially TPACK model WEB application which base on literacy and high order thinking skill.

2. Research Method

The study applies quantitative approach by quasi experiment by nonequivalent control group design. The subject of the study are the 2018/2019 students of Injob Teacher professional educational Program. 42 students used as sample, divided into two groups A and B, A was experimental group and B was control group. The design of the study displays as follow (Rusefeendi, 2010. Page. 53):

$$O \qquad X1 \qquad O$$
$$\overline{O \qquad X2 \qquad O}$$
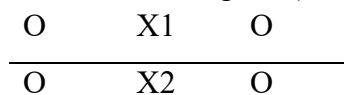
Picture 1. Non-equivalent Control Group Design

Keterangan:

O = protest or posttest result

X1= treatment toward experimental groups by applying Literacy Base TPACK and High order thinking skill

X2= treatment toward control group by applying conventional learning model

Picture number one, displays students of control and experiments group were given protest examination. Afterward, treatments were applied, and ended with posttest. The

experimental class was given Literacy Base TPACK and High order thinking skill, while control class was not given any treatment by the researcher. The instruments were designed to measure student's learning quality.   The recent instrument has been approved by proper, validity, and reliability examination. The data analysis researches apply independent sample t-test of SPSS 22 for window. Before conducting hypothesis test, data spread out normality test by applying Shapiro wilk test and homogeneity variant test among groups by applying Levene's test.

3. Result And Discussion

3.1. Description of Learning Quality Result

The initial learning quality earn by pretest. The pretest scores divided into categories of very good, good, fair, and poor. Good was given to students whom earn score over 80, fair was given to scores 70-80, poor was given to scores below 70. The control and experimental group pretest and posttest result display in the following table:

Table 1. Learning Quality Result Description

N	Pretes		Postes	
	control	**eksperiment**	**control**	**eksperiment**
	21	21	21	21
Mean	64.04	62,47	70,04	89,38
Std. Deviation	8,6	8,9	8,6	4.2

3.2. Learning Quality Hypothetical Test

Before hypothetically tested, data must be normality and homogeny tested. Normality and homogeny test indicates data distribution was normal and homogeny, afterward hypothesis test applied by independent sample t-test and the result as follow:

Table 2. T-test of Pretest and Postest Learning Quality Result

t'	Df	Sig (2-tailed)	Kesimpulan
3.934	24.4	0,001	H_0 ditolak

The output table above displays information of significance score as result of comparison test of the PPG student's learning quality competencies by the experiment and control group scores 0,001. The score was higher 0, 05 which concludes that Ho is decline, and H1 is accepted. It means, there are significance improvement differences between PPG students which apply TPACK (experimental group) within the group of student which do not apply TPACK (control group).

The learning quality pre and post hypothesis test by independent sample t-test indicates that there are learning quality differences among student which apply literacy base TPACK and high order thinking skill with those who do not apply TPACK and high order thinking skill. It is because TPACK and high order thinking skill model gave chance for students to construct their own knowledge independently. By integrating

TPACK learning model levels with technology literacy learning by WEB and high order thinking skill, an educator will be able to improve learning quality and design technological based learning which adapted to materials and students characteristics. It is corresponded to Wood&Ashfield (2008) statements that explain in order to develop a literary and learning quality, a teacher must be able to think innovatively and adjusted with technology.

Learning quality shaped by how teacher implementing learning, create students' activity and learning result *Astin, 1984). When a teacher enables to formulate integrative, attractive, and motivate learning for student, he/she will be able to create an excellence learning and improvements on student's learning achievements. It is meet the TPACK learning concept which integrates learning and teaching. The connection between technology literacy and high order thinking also improves literary learning and students thinking skill.

Technology literacy by WEB which completed with subjects matter, leading questionnaire, and discussion forum enrich teacher's academic competencies of PPG Injob student. Moreover, literacy base TPACK and high order thinking skill is an collaborative learning, A learning which involve students to interact with other in discussion, perspectives sharing, and question and answer. Collaborative learning demand student to think in any perspectives and high order thinking. Finally, as elaborate by Christopher, Thomas & Tallent-Runnels (2004) that the more people gain information associate to knowledge from many kinds of resources, the more information that can be applied. Furthermore, by discussion forum students getting information about cases in on going learning. The discussion trigger students certain prespective and they were demanded to be able to solve as the leaning quality improves, Dolman, De Grave, Wolfagen&Van Der Vleuten (2005).

By the elaboration above, it is clear that literacy base TPACK and high order thinking skill may improve PPG students learning quality. And by their competences , they will be able to create an innovative, learning activity grows and students learning achievement.

4. Conclusion

The result of the study is a literacy base TPACK and high order thinking skill learning model. Applying literacy base TPACK and high order thinking skill proves it is successfully improving the injob PPG students learning ability. The significance of the study by t-test score which indicates that students achievement whom given treatment of literacy base TPACK and high order thinking skill perform a higher learning quality compare to the other group. The literacy base TPACK and high order thinking skill model is expected to become learning alternatives and continuously implemented in order to improve teachers learning and competencies.

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