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CHARACTERIZATIONS ON BENDING EFFECT ON CUSTOMIZED SPLITTERS USING VARIOUS RADII OF ELLIPTICAL-SHAPED BLOCKS

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Abstract

Macro-bending effect unto polymer optical fiber (POF) based splitters study is done to analyse the performance and characterizations using several bending radii of geometrical blocks that hold a customized prepared polymer fiber splitter. A pair of etched fibers with similar core diameters are attached to the ellipse-shaped blocks built using matching refractive index material where the blocks were built with various bending radii. The tapered fibers were lapped closely with some forces exerted upon them in order to stimulate the splitting of modes between the two fibers. This study is done by experimental set-up where each of the splitter ports is connected with optical power meter to measure the power output while pressure is exerted. Characterization is executed in order to investigate and analyse which bending radius gives the most optimize splitting ratio with considerable low loss for the particular splitter prepared. As for normal force of 0.3 lbF, the optimum splitting ratio with low loss is specified having bending radius, Rc, of 13 mm whilst for external force of 3.0 lbF, bending radius is found to be 19 mm. Small bending radius stimulates the radiation of rays into the second fiber while larger Rc gives longer coupling length that optimize the splitting ratios. Efficiencies between simulated values and experimental values are also analysed.

Keywords: Macro-bending, Splitters, Geometrical blocks, Bending radius.

1. Introduction

Polymer optical fiber is widely used as an effective medium in short-haul communication system. One of the important components used in short distance communication system is splitters. Known methods used to develop splitters are fused technique as shown by [1], Y-splitter [2], side-polishing, chemical etching, thermal deformation, molding and splitter developed by industries that gives high performance [3]. This study aims to develop user-friendly and inexpensive splitters with low excess loss using POF splitter kit consists of different bending radii and several pairs of splitters.

This device is described as user-friendly since the various blocks having different bending radius will allow different amount of rays to couple to the second fiber therefore the splitter will give various splitting ratios instead just one splitting ratios as conventional splitter does and giving the users the option to set the demanded splitting ratios. Thus, this technique of splitter development [4] has the advantage of low-cost installation, environmental-friendly [5] with considerable low losses. There have been studies on bent losses [6-7], however, this study covers bigger bending radius since we use ellipse-shape blocks for the splitters. Ab-Rahman et al. [4] shows the study of etching process done unto the splitter which is important since the etching process duration affect the thickness of the core-cladding thickness, while in the other hand, Durana et al. [6] shows that bending effect of larger angle is unappreciated as compared to smaller bending radius. However, the study did not show the effect of power output of a splitter. While Musa et al. [7] shows the bending is independent of wavelength, they also show that as the bending radius is larger, the transmission of modes decreases using ray optics simulation. However, the study does not show experimental results or using circular fiber as shown in this study since the study [7] focus on planar waveguide.

In this study, two strands of POF were etched beforehand for about 25 mm long. The etching process duration was one hour to two hours long using harmless chemical solvent; acetone. The purpose of this etching process is to strip off cladding layers so when the fibers are lapped to each other, the modes that travel from the first fiber can be transferred to the second fiber. However, due to the etching process that eliminates the whole cladding layers around the fibers including the regions that will not be lapped, geometrical blocks that are built to hold these fibers were carved with grooves around the edges and the material that is used to build the blocks was acrylic, which has the same refractive index matching as the cladding layers. Thus, it will assist to prevent the modes from radiated out to the air and causes excessive losses. This particular splitters will be attached to different ellipse-shaped blocks each with different bending radii to analyse the effect of macro-bending unto the developed splitter with core diameter between 0.75 mm-0.85 mm and etching length of 25 mm long with two external forces exerted upon the splitters, namely, normal force and given force.

Force is used in this study in order to minimize the air gap that existed between the lapped fibers. The combination of the parameters is aimed to observe the best bending radius that give optimum splitting ratio and low excess loss for the particular splitter. The overall objective of this study is to analyse the bending effect of the particular splitter having similar core radius that was lapped in the middle and attached to different bending radius of elliptical-shaped blocks. Since bending of fibers or splitters affect the propagation of rays in the waveguide therefore this

study shows the behaviour of the splitting ratios, excess losses and insertion losses of the splitter developed using lapping technique having varied bending radii.

2. Experimental Setup

Experimental procedure is shown in Fig. 1 where the flowchart briefly shows the process of the splitter characterized using different bending radii. A customized platform as shown in Fig. 2 and ellipse-shaped blocks are built using refractive index matching materials, i.e., acrylic that has similar refractive index of cladding, 1.459. The reason is to replace the etched cladding layers so that the modes radiated from the first fiber can be prevented from radiated out to the air, thus, it will be reflected back to the cores. The shapes of the blocks are similar, however, only the radius of the bending varied with 10 mm, 13 mm, 16 mm, 19 mm, 22 mm, 25 mm and 28 mm particularly.

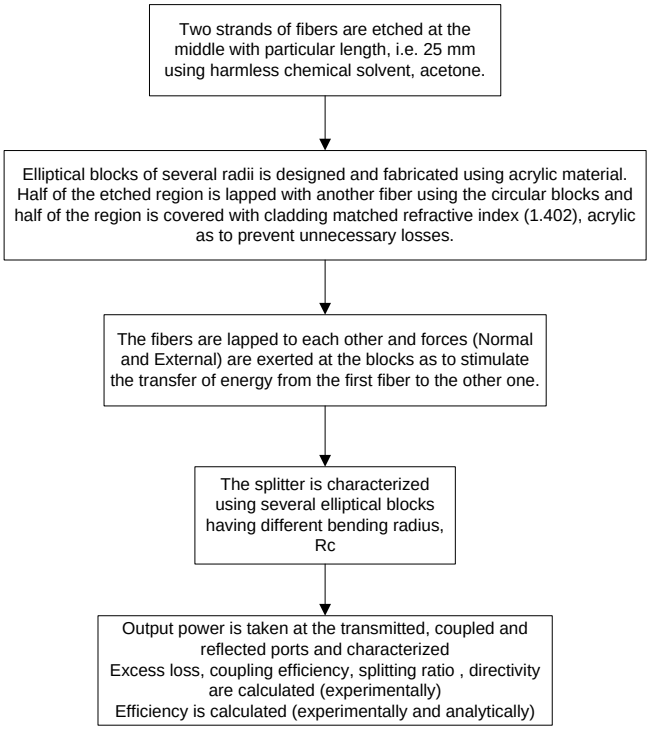

Fig. 1. Flowchart of Experimental Procedure.

POF fiber of 30 cm length is etched in the middle area with etching length of 25 mm. The diameter of the cores after an hour of etching is between 0.75 mm-0.85 mm. At this diameter, the cladding layers have been etched fully which left only the cores at the particular area. The pair of POF strands are placed at the middle groove of the ellipse-shaped blocks.

When lapped together, two forces were imposed onto the blocks at the other end of the groove, particularly, normal force, Fn of 0.3 lbF and given force, Fc of

3 lbF. The force is imposed on the blocks therefore also the coupling regions between the two etched area. Normal force is assumed as the normal stress existed between the two fibers when touching while no excess pressure existed. Thus, air gap between the two fibers is assumed to exist.

Source of 650 nm red light is injected into input port, P1 and went through coupled port, P3, throughput port, P2 and reflected port, P4. Throughput port, P2 is the port where the rays from the source propagate directly under the same waveguide while coupled port, P3, is the port where the rays are coupled into when the core of the propagated rays is lapped to the other core and the rays are transferred to the second core and propagate along the new waveguide. Reflected port, P4, in the other hand is the port where the propagating rays that flow from the first fiber to the second fiber went under some reflection to the P4 port instead of propagating through coupled port, P3. The values of all output power at all the ports are recorded accordingly.

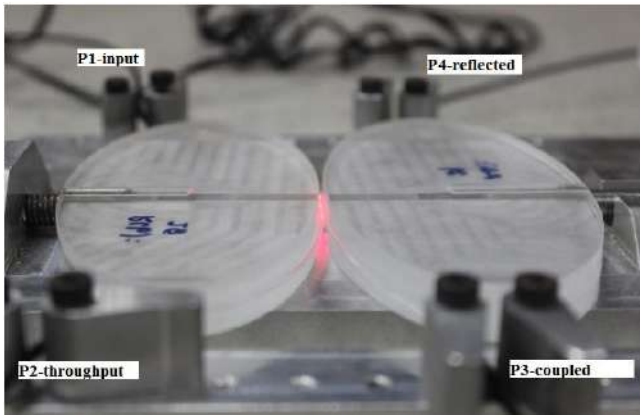

Fig. 2. Customized Splitter using Ellipical-shaped Blocks and Various Radii.

Force gauge as shown in Fig. 3 is used to exert pressure intended unto the blocks and the fibers. Different bending radius were used for the particular splitters to observe and analyse the characteristics and behavior of the splitter when different bending were applied unto the fibers with the existence of normal force and given force. Bending radius or macro-bending is known to have stimulated the radiation of modes from one fiber to another.

Fig. 3. Force Gauge used to Exert Pressure onto the Splitter.

3. Results and Discussions

Figure 4 shows the data collected from the force gauge where normal force was imposed onto the splitters with average value of 0.3 lbF. Figure 5 in the other hand shows the average force of 3.0 lbF when the gauge exerted onto the blocks for few seconds. During the force exertion, readings of output power at coupled port, throughput port and reflected port were recorded.

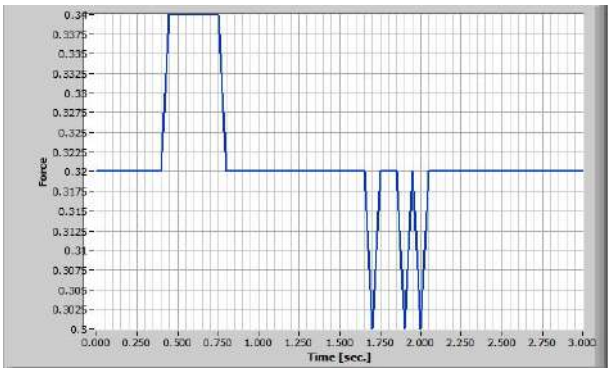

Fig. 4. Pressure of Fg of 3 lbF is Exerted upon the Splitters.

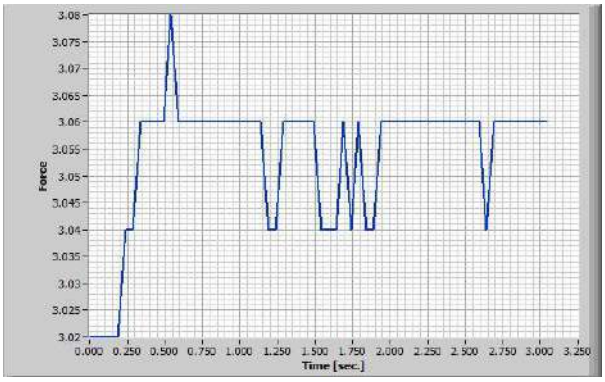

Fig. 5. Normal Force, Fn of 0.3 lbF is Exerted on the Splitter.

When the pair of splitter is attached to different bending radius blocks of radii 10 mm, 13 mm, 16 mm, 19 mm, 22 mm, 25 mm and 28 mm, different values of output powers were obtained. Characterizations on each of the bending radii were analysed with the existence of different forces. As shown in Fig. 6. to Fig. 12., the Rc is the radius of the blocks respectively as mentioned above. Figure 6 shows the splitting ratio of coupled port for all the bending radii at normal force and given force.

As shown in the figure, the splitting ratio of the given force shows higher percentage compared to the normal force. This is due to the small existence of gap between the fibers compared to the small force of 0.3 lbF that gives lower

splitting ratio due to the air gap between the fibers. This in particular prevented the propagation of modes being transferred from the first fiber to the second one. From the data shown, we can see that at normal force, the bigger the bending radii, the lower the splitting ratio.

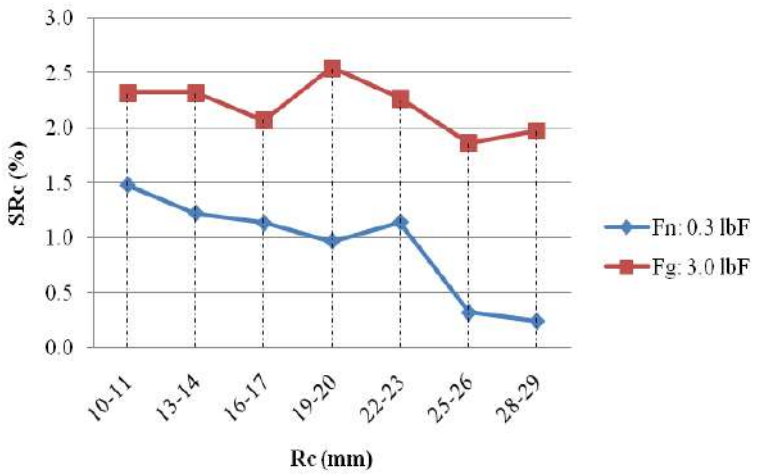

Fig. 6. Splitting Ratio of Coupled Port for each of the Bending Radii at Normal Force and Given Force.

However, when the force is bigger, the splitting ratio difference is smaller when the bending radii increases from 10 mm to 28 mm. When normal force was imposed, bending radius of 10 mm shows the highest splitting ratio and bending radius of 28 mm shows the lowest splitting ratio. The bending radius of 4 mm shows more critical bending rather than other bending radius, thus, more modes radiated out from the first fiber to the second fiber. As the bending radius gets bigger, low critical bending was imposed and less modes propagate out from the first fiber to the second fiber due to the small stimulation of bending factor.

However, in the case of higher force exertion, the air gap existed has cease and the fibers were close in proximity. Thus when the bending radius is small, i.e., 10 mm, 13 mm and 16 mm, the critical bending stimulates more modes to transfer from first fiber to the second one. However, when the bending radius gets bigger, i.e., 19 mm, 22 mm, 25 mm and 28 mm, and less critical, bending ceases to become the factor of mode transferring between the fibers, rather the small gap between them counts as the factor that encourage the modes to propagate to the second fiber. The given force has closed the gap and makes the fibers closed in proximity thus, the percentage of modes propagate to the other fiber is higher than when the gap is bigger. Thus, the difference of splitting ratio when the bending is 10 mm has small different when the bending is 28 mm.

Nonetheless, the bending plays important performance parameter since although the gap is closed, small bending radius gives the highest splitting ratio. As can be observed, the splitting ratio is small overall, this is due to the other factor that results the small coupling between the fibers. The diameter of the cores and 25 mm of etching length is quite long for this developed splitter. The region

that is not lapped to each other exposes the bared core area and most of the rays that travelled along the bare area gets lost into the air. Thus, fewer modes were transferred to the other fiber.

Figure 7 shows the splitting ratio at the throughput port. Splitting ratio of the normal force is higher for all the bending radius compared to the splitting ratio of the given force. More modes stay at the first fiber rather than transferred to the other fiber when normal force is imposed. From the figure, as the bending radius gets bigger and flatter, the splitting ratio at throughput port is higher. Again due to the critical bending radius of small bending, i.e., 10 mm, 13 mm and 16 mm, the modes get radiated from the first fiber to the second fiber more than when the bending radius is less critical and bigger. Thus, the rays stay at the throughput port when there is no stimulation factor that helps the modes to propagate to the other fiber.

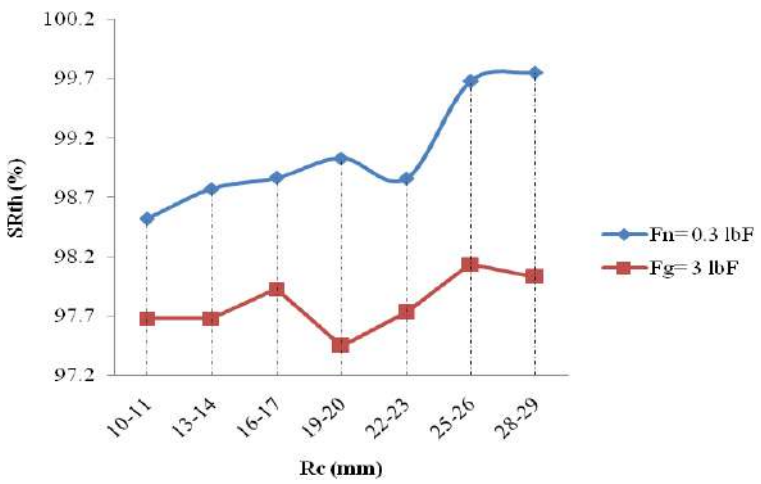

Fig. 7. Splitting Ratio at Throughput Port.

As for the given force, when the gap is closed and the fibers are closed in proximity, although the bending radius gets bigger, the less existence of gap between the fibers help the modes to get transferred from the first fiber to the second one. Thus, lower percentage of rays propagate in the throughput port. However, for small bending radius, more modes get transferred to the second fiber due to the radiation of the bending factor.

Figure 8 shows the excess loss for the developed splitter. The excess loss shows small significant different when the bending radius get bigger for both normal force and given force. For normal force, for most of the bending radii, low excess loss was obtained due to less modes get transferred from the first fiber to the second fiber. When the gap is closed, at the small bending radius, excess loss is bit higher due to the critical bending of the fiber. The length of the bare core area is also a factor that contributes to the loss. When bending is less critical, less radiation stimulates the propagation of modes from the first fiber to the second one, thus, lower the loss.

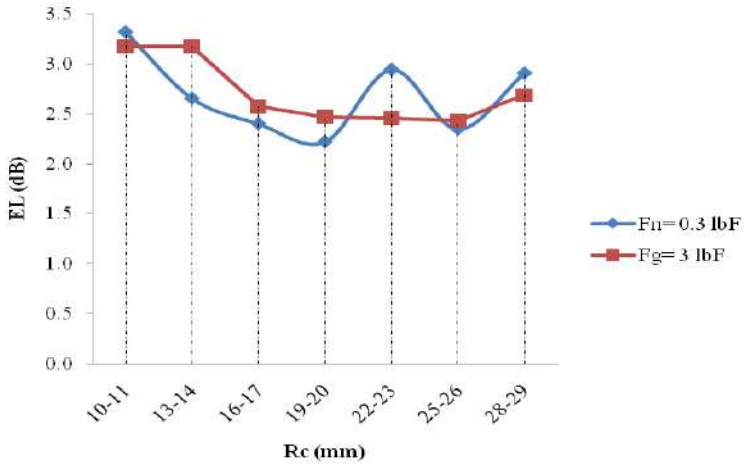

Fig. 8. Excess Loss for the Splitter at Each of the Bending Radii at Normal and Given Force.

In Fig. 9 and Fig. 10, insertion loss at the throughput port shows similar characteristics as the excess loss, thus, similar factor that contributes to the loss. Insertion loss at the coupled port in the other hand where for normal force it is higher than the given force which is due to the gap that existed between the fibers. Most of the loss is contributed to the length of the etching area that is not lapped to the other fiber. For given force, the loss is quite similar for all the bending radii. Therefore, bending radius has small impact onto insertion loss.

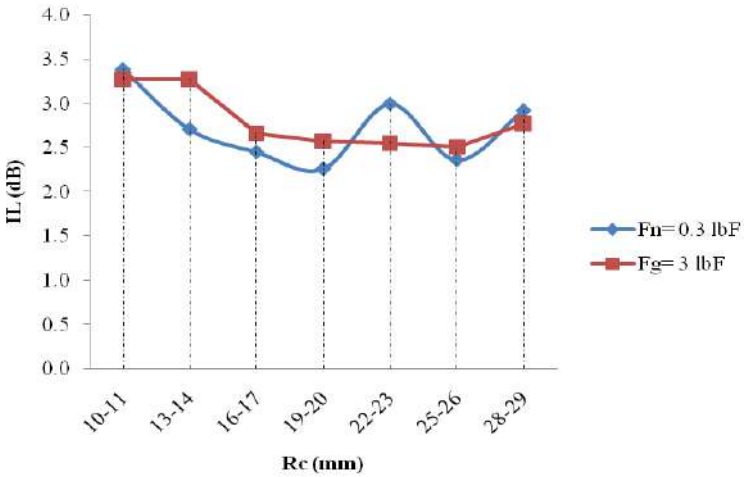

Fig. 9. Insertion loss at Throughput Port for the Splitter at Each of the Bending Radii at Normal and Given Force.

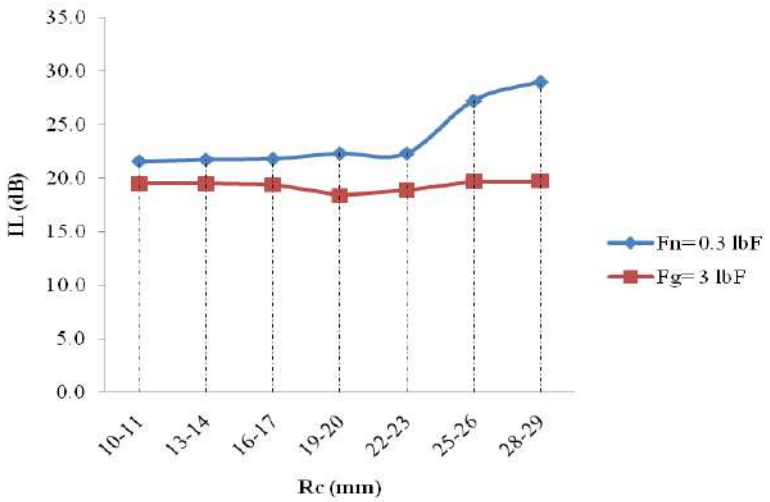

Fig. 10. Insertion loss at Coupled Port for the Splitter at Each of the Bending Radii at Normal and Given Force.

Figure 11 shows the directivity at the reflected port where directivity of the given force is higher than directivity of normal force. When the bending radius gets bigger, directivity decreases. Higher loss is observed when small bending radius is used in the platform. This is due to the more rays or modes that get transferred from first fiber to the second fiber. Thus the directivity at the reflected port is higher. However, when the bending radius is biggest, the directivity increases. This is because the coupling length between the fiber is longer and more rays are reflected at the particular port.

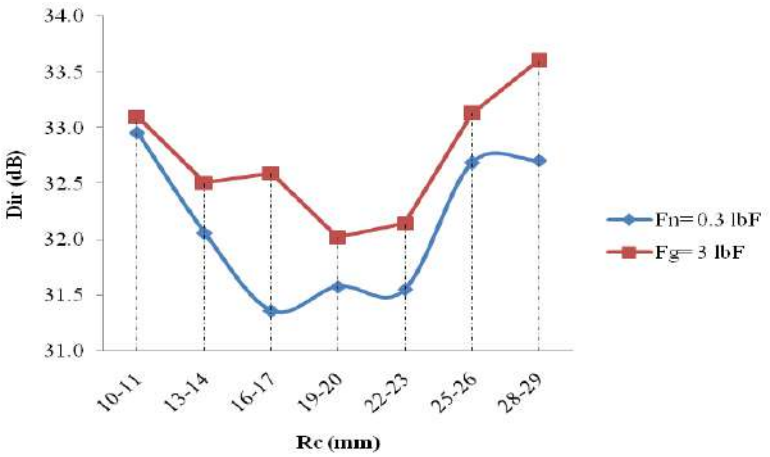

Fig. 11. Directivity at Coupled Port for the Splitter at Each of the Bending Radii at Normal and Given Force.

Figure 12 shows the splitting loss at the coupled ports for each bending radius at both normal and given forces. Splitting loss at bigger bending radius is higher due to the low splitting ratio of the modes. More modes were propagating to the second fiber when bending radii is smaller. Less splitting loss is observed when force of 3.0 lbF is imposed unto the splitters compared to the normal force since the air gap prevents the modes to be mostly propagates along the second fiber. However, by analyzing the profile, the splitting loss shows consistent loss when given force is imposed when bending radii varies due to the small variation of splitting ratio when the bending radii get bigger.

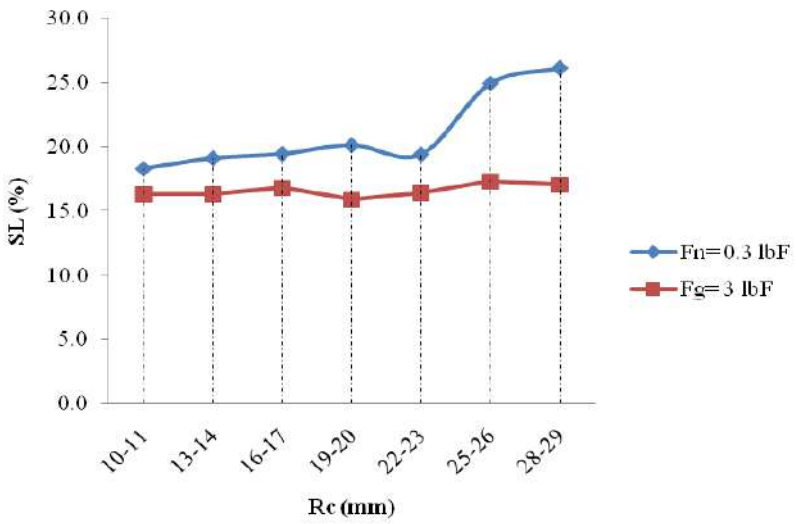

Fig. 12. Splitting Loss at Coupled Port for the Splitter at Each of the Bending Radii at Normal and Given Force.

4. Comparison of Efficiency between MathCAD Simulation and Experimental

The efficiencies of the splitter are compared to simulated efficiency of two lapping fibers having different coupling length, Lc according to the bending radius, Rc of the elliptical blocks. Coupling efficiency obtained by Coupled Mode Theory (CMT) by Ogawa [8] is integrated with Hertz's Law of elliptical point contact which shows in the Eq. (1) below:

$$\eta = \int_0^1 \sin\left[\left(\frac{1}{\sqrt{\pi}}\frac{\sqrt{NA(n0,n1)}}{\sqrt{k(\lambda)\cdot(a)}\cdot(n0)}\right)\left(\frac{(t)\cdot(1-t)^{1/4}}{a}\right)(2\cdot C)\cdot[1]\right]^2 dt \qquad (1)$$

Simplified CMT [8] shows that the longer the coupling length, the higher the coupling efficiency and the values of efficiencies in this study are plotted as in Fig. 13 for each coupling length. The coupling length, Lc for each bending radius, Rc of 10 mm, 13 mm, 16 mm, 19 mm, 22 mm, 25 mm and 28 mm are 2 mm, 3 mm, 4 mm, 6 mm, 8 mm, 9 mm and 10 mm respectively.

The efficiencies are shown for each Lc where the highest efficiency is 1. However, the range of efficiencies simulated ranges from 0.06 to 0.71 or 6% to 71% depending on the coupling length. From Fig. 13, the longer the coupling length, the higher the coupling efficiency.

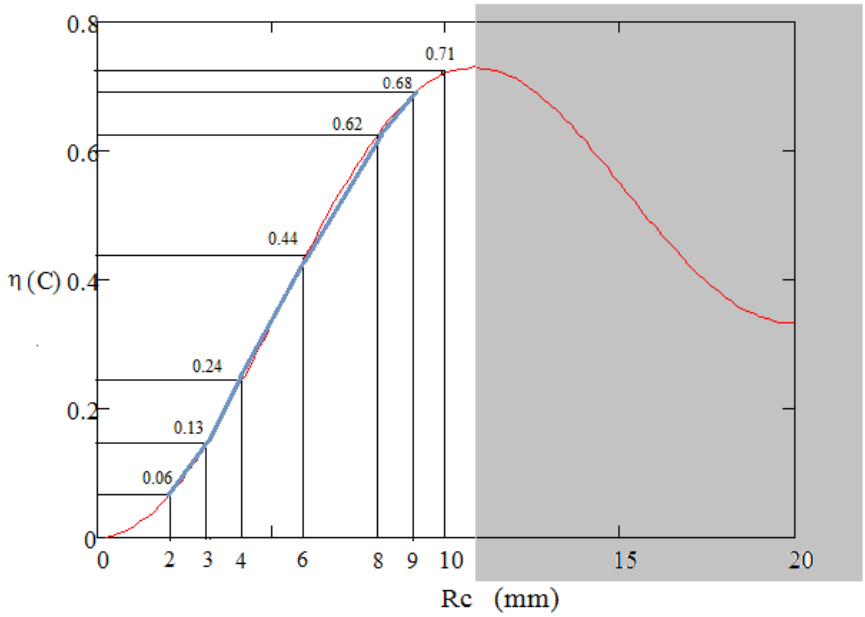

Fig. 13. Coupling Efficiency Obtained by MathCAD Simulation Using CMT and Hertz's Law Integrated Equation.

Figure 14 shows the plotted values of efficiency between the simulated efficiency of CMT and Hertz's Law and experimental splitter efficiency having different bending radii and coupling length. From the graph, the pattern of both graphs are similar although the different values of efficiencies between the simulated and experimental values show losses that are due to insertion losses of the fibers, imperfect alignment between the fibers and the meters and long tapered length of the cores where bending results in stimulating the rays to radiate out of the fibers. However, due to small bending radius of 10 mm, 13 mm and 16 mm, the values of the efficiencies are higher that simulated values since the analytical formulae does not account bending parameter.

Smaller bending radius of the splitter stimulates the rays to radiated and transfer from the first fiber to the second fiber extensively. However, as the bending radius gets larger, bigger bending angle is observed, thus, bending hardly affect the coupling and splitting of the splitter, rather, the longer coupling length between the lapping cores helps the coupling between the fibers. The larger bending slows the radiation rate of the rays to the second fiber. In addition to the experimental condition of the fibers, i.e., insertion losses and long tapered length, therefore, the efficiencies of the splitter in experiment are lower than the simulated values at larger bending radius and longer coupling length.

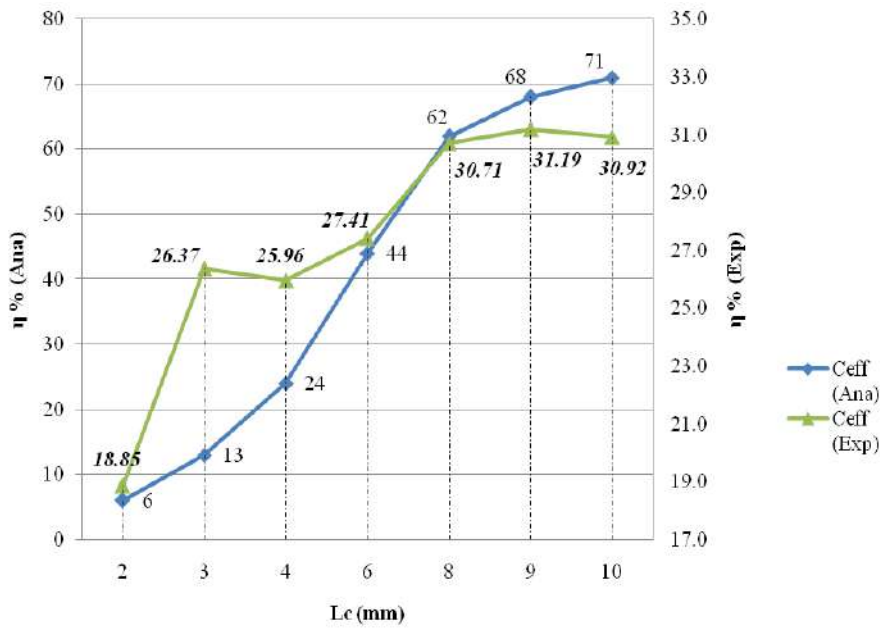

Fig. 14. Comparison between Coupling Efficiency by Simulation and Efficiency by Experimental.

5. Conclusions

Characterizations and analysis done show which bending radius is optimum for the prepared splitter. For the particular splitter, for normal force imposed, the bending radius that gives the highest splitting ratio is 10 mm, 22 mm and 13 mm. However, for the smallest excess loss, the bending radius that gives the minimum loss is 19 mm, 16 mm and 13 mm. Thus, the optimum bending radius with highest splitting ratio and lowest excess loss is 13 mm for splitter of core diameter between 0.75 mm -0.85 mm, etching length of 25 mm with force of 0.3 lbF which is normal force. For given force exertion, 3.0 lbF, the bending radius that gives optimum splitting ratio is 19 mm, 22 mm and 13 mm.

For lowest excess loss, the bending radius that gives minimum loss is 19 mm, 16 mm and 25 mm. Thus for this particular splitter with given force, the best bending radius that gives optimum splitting ratio and low excess loss is 19 mm bending radius. Therefore knowing the compatible bending radius for the prepared splitter of core diameter, Dc of 0.75 mm-0.85 mm, etching length of 25 mm for both normal force and given force, we can develop an efficient splitter that can give the highest splitting ratio with minimum losses based on the study done for multimode step-index fiber.

This study also analyses the efficiency of the splitter having different bending radius and coupling length. The pattern of efficiency is quite similar, however, due to insertion losses of the lapping fibers and long tapered length of the cores lead to low efficiency observed for experimental values.

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CURRENT ISSUES IN PEDAGOGY AND PRACTICE FOR EARLY CHILDHOOD, ELEMENTARY AND SECONDARY EDUCATION

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ABSTRACT

After analyzing some paths of research on affectivity in pedagogical relations, I present the main findings of two recent research projects carried out in Early Childhood, Elementary and Secondary schools based on the views of 2nd and 3rd cycle primary school pupils. The first,among other methodologies, analyses pupils' narratives to bring to the fore their (dis)satisfaction as regards the quality of relations with their teachers. The second is based on an analysis of data gathered through interviews and application of the Relations with Teachers sub scale from the Academic Experience Questionnaire, pointing out the qualities pupils appreciate in their teachers, chiefly as regards relations, in line with their age group and gender and looking at some implications for the teacher education.

Keywords*: Pedagogical relations; Affectivity; Pupils' views.*

Despite the heavy investment in teacher education, difficulties continue to be felt in the area of pedagogical relations. Little has been done regarding this facets of the teaching activity, either in initial training or in ongoing training. Especially in the former, the problem of pedagogical relations is dealt with (if at all) in a haphazard, non-systematic and non-grounded manner. However, when teacher education needs are analysed or the effects of the initial shock with the reality are studied, it can be seen that this is a relevant and well - referenced domain. We also know that a large proportion of teachers, throughout their careers, are unable to overcome difficulties concerning relations, which has a negative impact on the success of the pupils, and the teachers' well-being and sense of professional fulfillment, as studies have shown. While it is true that the current socio-economic and cultural climate challenges teacher education to come up with innovative answers in fields such as curricular development or information and communication technology, we cannot forget that the relational dimension is the true *crux* when it comes to creativity, capacity for self control and self affirmation, and in tandem lends the teachers the ability to decentralize, and work in a team. As well as these skills and competences of a personal and social nature, teachers need to feel "equipped" to know how to observe and analyze educational situations through the application of research techniques and tools, and have the ability to "look" at the information in the light of a multi referenced theory that enables them to carry out good diagnoses and devise suitable responses for the different contexts.

It is up to the research to build knowledge about this reality, supplying the reference frameworks and methodological guidelines that provide the background to this dimension of professional training of teachers and their praxis. This text derives from our conviction that, as well as other dimensions of the pedagogical relationship, it is necessary to produce knowledge concerning the relevant affective dimension of the lives of teachers, pupils and the interaction between the two.

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The dominant pedagogical relation in modern times "*smothered*" any expression of affectivity for a long time, given that the ideal relation was considered the transmission of knowledge and the keeping of a distance between the master and the pupil. In line with this thinking, and despite the gradual and progressive impact of other pedagogical models that highlighted the role of affectivity and its expression in the pedagogical relation, research has not paid particular attention to its study.

In this article, after clarifying some crucial concepts to enable analysis of the topic, we review the research and pedagogical models that have contributed to further understanding in this field. We focus especially on the pedagogical relation in its restricted sense, namely the pupil teacher interactions and pupil-pupil interactions. In the second part we present the results of two research studies carried out with primary school pupils about their perception of their relations with the teaching staff.

METHOD

This study used a quantitative approach with survey method. Related to the survey, according to Lodico, Spaulding and Voegtle (2010: 201-204), explains that' "*Descriptive survey research, the approaches share the following common characteristics:* (a) Identify a Research Topic; (b) Conduct a Review of the Literature; (c) Develop Research Questions; (d) Develop the Survey".

In this second part we shall briefly describe two research projects carried out on the topic of affectivity and emotions in the context of the pedagogical relation. The first study aimed to find out, among other aspects, how the pupils interpret the interactions of "*classroom life*", how they perceive the didactic-pedagogical relationship established and what, in their opinion, are the main factors that help create a climate for learning, expressing emotions and well-being. A questionnaire was used to gather the data containing "open" questions, applied to a sample of 310 pupils spread over the 5th, 7th and 14th years of schooling in two public schools in central Jakarta, Indonesia.

The questionnaire, made up of 6 questions, aimed to find out the pupils' thinking about what happened in the lessons in which "they learned and felt happy", and what happened in the lessons when their results and feelings were the opposite. For example, the first question was as follows: "Imagine you are in a lesson in which you believe you have learned a lot and at the same time felt happy. Write down what the teachers did in these lessons when you learned well and felt good".

Analysis of the content allows us to establish the following thematic areas: teaching methods, communication style and relational aspect of the teacher's action. We shall briefly outline the conclusions as regards the relational aspect.

RESULTS

An analysis was subsequently carried out of its psychometric qualities, concluding that they were good (SD, 7.47; Alfa, 833). Only afterwards were these procedures applied to 142 pupils from the 6th year (n=85.60%) and 9th year (n=57.40%) of a public school in central Jakarta. As for the gender breakdown, in

the two school levels together 69 pupils were male (48.6%) and 73 female (51.4%). Their ages ranged from 11 to 18, with the average age of 6th-year pupils 11.59 (SD=0.89) and 9th-year pupils 14.44 (SD=0.73). The sub-scale is made up of 12 items concerning dialogue with the teachers, contact inside and outside the classroom and perception of the time teachers have to help the pupils. One can say that, as well as the methods and communication style, there are a set of relational characteristics established in the classroom which can be considered responsible for the positive or negative feelings of the pupil: (a) *The teacher's style of relation*. In lessons in which the pupil feels satisfied and happy an understanding relation is built, above all one which includes comprehension and trust. "This lesson made me feel good, as if I was at home, at ease without anybody saying: "Sit still, don't touch that!- It was good". The ideal situation for many of the interviewees is a teacher "who knows how to have fun and a joke but who is able to command respect at the same time." Humour, when integrated into the teaching content, leads to better learning, arouses interest, makes tasks more enjoyable and enables the involvement of the pupil in the learning, to such an extent that the pupil perceives time as "going more quickly" and even "feels like staying for longer". But these aspects are definitively linked to the management of verbal and non-verbal communication, the methodologies used by the teachers and the content itself. Descriptions such as the following express this view: "Me, in the Visual and Technical Education lesson felt good because I didn't know how to draw a face and I asked the teacher and she explained how to do it very well. She came to me, was very friendly and had a lot of patience." The positive feedback of the teacher's initiative is another communicative factor that satisfies the pupil, having a big impact on their self-esteem: "I felt an intelligent, more complete person. I made an effort to understand"; (b) *The teacher's personal characteristics* that were pointed out and valued positively in this sample were as follows: kindness, calmness, tolerance, patience, comprehension, respect, fairness, equality, justice and impartiality. These characteristics, as well as the teacher's values and attitudes, have considerable weight in the relation that is established in the classroom and intertwine with the learning and positive feelings of the pupil. Many of these aspects are clearly outlined by another pupil: "In lessons where I considered that I learned more and where I felt satisfied and happy the teacher was kind, caring, looked at everybody in an equal light and treated all the pupils the same way. The teacher considered us all equal, did not get angry with the pupils and did not have favourites".

These are teachers who are there to help, show understanding, give everybody the same chance to take part and are fair: "there was no injustice: if I was the first to put up my hand it was me who would speak"; (c) In order to *manage classroom behaviour* it is essential to instil some rules which are clear and negotiated and which all the actors have to stick to. Making sure the rules are followed implies adopting strategies that are effective to a greater or lesser extent depending on each teacher and the image they transmit of themselves to their pupils. A summary of the pupils' representations as regards keeping order and controlling behaviours, and which the pupils associate with "good" teaching, includes aspects such as: creating a climate of respect, establishing rules and making sure they are followed, reprimanding when need be, reprimanding calmly, punishing fairly and monitoring the tasks set.

A large proportion of pupils stated that in the lessons in which they learned a lot and felt emotionally good there was an *environment of respect and order*. In order

to foster this environment students have the understand the reasons for the rules, which also depends on the teacher's effort: "When somebody tells a joke the class starts to laugh and then doesn't stop fooling around, but if the teachers talked with us calmly and explained that we can't do that I think it would have the desired result. Although he may think we are too old to be told that".

The differences between the averages of the sub-scale separated per school year shows that the 6th-year pupils present significantly better averages than the 9th-year pupils. This finding suggests that the school year has a differential effect in the pupils' perception of their relations with the teachers. The results suggest that as the pupils progress through school, the relational aspects with the teachers become less relevant.

Analysis of the correlation between the pupils' ages and the data obtained also allows one to conclude that as the average age increases, the points on the aforementioned sub-scale go down; it seems that the age of the pupils negatively correlates to the perceived relations with their teachers. As the pupils "grow", they put less emphasis on the "proximity" of the teachers and give more importance to their academic and pedagogical skills. It is also seen that pupils from the sample have a very positive representation of their relations with the teachers.

DISCUSSION

Affectivity in The Pedagogical Relation

We view the *pedagogical relation* as one of the tasks encompassed in the *educational relationship*. This occurs when ever "a relationship is established between at least two human beings, whereby one seeks, to a greater or lesser extent in a systematic and intentional manner and in the most wide-ranging circumstances, to transmit to the other certain cultural contents (*educate*), ranging from the most basic needs for survival to others that may be of gratuitous fruition". As for the pedagogical relationship in its more restricted sense, it consists of the "interpersonal contact" that is established, in a demarcated time and space, in the course of the "pedagogical act" (hence, in a teaching-learning process), between the teacher-pupil-class (well defined agents) (Owen and Donnachie, 2002, p. 36). Both the quality of these contacts and their results depend on multiple factors, among which the personalities of the teacher and the pupil, involving subjectivity, interpretations (individual and shared) around situations and experiences in the classroom and school, life paths and personal projects.

It is this combination of subjectivity that is essential and demands an ethical code that keeps the teacher aware of his responsibility as a "mediator" in the construction of the pupil's "itinerary", as an authority in the cognitive, moral and affective perspective. This responsibility goes beyond the construction of each particular branch and its scope impacts both on society and the future. Just as one expects teachers to tell the truth (logical, scientific and moral), one also expects them to have behaviours and attitudes " that bring to the fore their civic, ethical and moral values" (Donnachie, 1997, p.73) and consequently interact with justice, not restricted to compliance with the law and regulations, but devotion and recognition of the other.

Affectivity is a polysemous concept. The dictionary definitions suggest sentiments of affection and tenderness, a relation of mutual caring and help, as well

as empathy, friendliness, warmth, love and compassion. Mallaguzzi (2001), following in the wake of other authors, proposed analysing affectivity in five components: motivation, confidence in oneself, attitudes, emotions and causal attribution. Alexander (2004:37), These five components play "*a hugely important role in learning and teaching*". Research into the topic, in line with the presuppositions of each author is deepening certain aspects, and adding new ones, such as beliefs, feelings, interests, values, etc, which translates the complexity and amplitude of the object under analysis. Our approach does not break free from these ambiguities; however, we highlight the attitudes of respect, empathy, openness towards the other, and the aspects linked to feelings (*subjective well-being*) and emotions (joy, satisfaction, confidence, one's own feelings), deriving from the pedagogical interaction in which these attitudes prevail.

The discussion on the role of affectivity in education is as old as the discussion on relations between thinking and feeling, reason and emotion, mind and heart. According to Oberhuemer (2004: 16), the major problems of education come from the absence of continuity between reason and the body, the person and society, the person and nature; and Donaldson (1998) believes that the major problem of traditional education is in the distance that it maintains between the child and the adult, with the former intending at all costs to subject the latter. In general, all reforming pedagogical thinking of the 20th century, regardless of the conceptual and procedural differences of each movement, proposes the connection and functional interdependence between the intellectual, emotional, social and manual capacities, in the name of the integral and autonomous development of the child.

Research has shown that it is through affectivity that the individual gains access to the symbolic-cultural systems "*originating cognitive activity and making it possible to make progress, as these are the desires, intentions and reasons that will motivate the child in the selection of activities and objects*" (Leite and Tagliaferro, 2005, p. 50). Cognitive and affective processes interrelate and influence one another mutually. This line of research is strongly backed up by the work of Wallon (1968) and Vygotsky (1998). One of Vygotsky's central ideas, contained in the concept of *zone of proximal development*, is that specific relations between people are associated with the development of superior functions, making the teacher's willingness to provide help and support essential. Likewise, recent research in the field of neurosciences has shown that feelings and conscience are not alien and separated; feelings and emotions have a strong impact on the mind, and one can even say that they constitute the roots of conscience (Moyles, Adam and Musgrove, 2000). Studies in this area also suggest that "the human brain requires a certain challenge to activate emotions and learning", and that "a safe physical environment is especially important to reduce high levels of stress", which hinder well-being and learning. It therefore seems there is a strong relation between the learning of pupils and: the quality of the educator-child relationship, namely the safety and emotional comfort felt in early schooling; the social support which is obtained by the educators (Hughes *et al*., 1997); the school ethos where one cultivates close human relations, in articulation with the authority of adults (Freire, 2001).

Analysing the issue in the light of the *teacher's relationship with the pupils*, implies the teacher understanding aspects such as how his action is understood (including the ability to listen to the pupils), competence (concern for the actual learning of each pupil), a fair relationship and distribution of power (absence of

favouritism or exclusion, sharing of decisions and initiatives), and personal facets (open to the pupils' interests and problems, showing care and concern, valuing their freedom and feelings, etc).

In this field, among the conclusions draw from the research we highlight those that show the more the pupils perceive the absence of favouritism and the neutrality of the teachers, the more they trust them and attribute them the status of authority draws attention to the phenomenon of reciprocity of feelings and behaviours that "are translated into a direct relation between the 'kindness' of the teacher and the affective and behavioural conduct of the pupil," in a kind of "*circular causality* between kindness, mutual respect and appropriate behaviours". There are also classic studies that reveal sharp differences in the interpretation and valuing of the teachers' actions according to the age, schooling level and sex of the pupils. On this point Alexander (2001, p.404) pointed out that in adolescence, when the teacher oversteps the mark in terms of verbal manifestation of warmth and affection for the pupils and the class, they interpret these attitudes as a *strategy of seduction*, used for "exercising control that in their eyes is not legitimate, constituting a kind of unacceptable violence (*albeit symbolic*)". The facts suggest that at this age "the teacher's kindness is not shown through the affective aspects, but through technical competence, *the ability to make the pupil take part in the lesson*".

The affective dimension in the curriculum management is linked to the verbal and non-verbal behaviour of the teacher; as regards non-verbal postures, we are talking about *proximity* (teacher moving physically closer to the pupils to help them) and *receptivity* (translated by the effort to look at and listen to the pupil). As for the verbal communication of the teacher, there are multiple positive facets to be assessed, such as *oral incentives, support, feedback* and *praise*. These are *teaching behaviours* that, according to: (1) encourage pupils to carry out tasks, showing positive expectations about their potential; (2) help and collaborate in the understanding of content (repeating, making an effort to be clear), solving problems, in carrying out the task; (3) encourage a humanised assessment (and therefore a "fair" one), respecting the abilities and characteristics of the pupils, leading them to actively take part in the process, to reflect and learn from their own mistakes; (4) involve the pupils in the decisions and choices made in the lesson, both as regards the *structure of the curricular activities* (some optional contents, teaching and learning methods, processes and assessment moments, etc), and as regards *the structure of the social relations* (definition of rules, debate on non-compliance, decisions regarding penalties for infractions, etc.); (5) do not marginalise, stigmatise or ridicule pupils or exclude anybody from obtaining help, providing individual support when possible.

In a study on a *customised management of the curriculum*, in which a large proportion of the teaching behaviours listed above were observed, Siraj, Sylva and Muttock (2004:12) concluded, "defining criteria of choice at individual level makes it possible to create an affective connection concerning the choice, hence immediately asking the pupils to reflect, decide and accept responsibility for their decision, as such nurturing an affective attachment".

In addition to all these aspects of "know-how" and professionalism, one must take into account the personal characteristics of the teacher, such as their supportiveness (*ability to listen and understand without being critical*), a friendly and respectful *approach* (for example, greeting and talking to the pupil outside

school and the classroom) and especially the *ability to foster a climate of well-being and good humour* (where the pupil can laugh at the same time as feeling motivated to work). The teacher's need to be able to temper strictness with humour has long been acknowledged. According to Alexander (2001: 345) the pupils, in getting to know their teachers well, are able to regulate their behaviour in line with the predominant traits of each teacher: "there are, regarding this matter, at least three kinds of teachers: "*those who the pupils can joke with and abuse and who do not reprimand them; those who they can joke with but cannot abuse; those who can never by joked with*".

Another aspect related to the management of the interactions concerns the instilling of discipline. The way the teacher exercises this control is crucial for the success or failure of the pedagogical relation. Research (Siraj, Sylvia, Muttock and Gilden, 2002) has concluded that the imposed and legitimate basis of power is negatively linked to the affective and cognitive learning of the pupils; whereas the use of referent (personal) power and expertise (*cognoscitive*) power by the teacher, are accepted by the pupil, leading to learning in a disciplined manner. Although teachers in the case of class disturbances should impose their authority, they have to do it within the parameters of respect for the pupil. It is the pupils themselves who value the teacher's ability to "constrain" (*just as their ability to "teach*"), but demand that it is done with "*humanism*". Another analysis angle of the teacher's relation with the pupil concerns the intention of achieving a set of goals of an affective nature through the classroom practice.

However, the need to foster, in tandem with the curricular knowledge, a positive socio-affective climate amongst the pupils (ability to work in a group, show solidarity and mutual help, accept differences, raise awareness of the incompleteness of the individual and the knowledge) is viewed not only as necessary and urgent but possible, which calls for a big investment in teacher education in this field.

Another angle of analysis is the *pupil's attitude towards the teacher* and the personal consequences deriving thereof. The teacher's feelings with regard to the class's characteristics and the behaviour and performance of some pupils have led to studies on teacher motivation, teacher discomfort and teachers' emotions such as fears, guilt, pleasure and suffering. As stated by Hargreaves (1998: 159), although good knowledge has been obtained about teachers' thoughts in the different areas of their professional activity, "we know a lot less about how they feel when they teach, the emotions and desires that motivate them and moderate their work." This emotional facet of teaching, in spite of some recent studies (Alexander, 2008) continues to be an ongoing line of research.

The third analysis angle we refer to is the *relations amongst the pupils*. Research has shown that pupils like to go to school more because of the socialising and friendships made with their peers than because of the lessons and learning. However, there is also a positive correlation between liking school, the attention paid to the teacher and academic success (Feitosa *et al*., 2005). The friendship and companionship built among the pupils and the repercussions in achieving the educational aims, even if relatively unstudied, have proven essential to nurture the pupil's liking for school and to obtain success. One can even say that "most of the information, attitudes and values that the young acquire at school are formed in the midst of this complex territory, unexplored to a greater or lesser extent, that constitutes the system of peers. Resuming what we stated above, the teacher has to

strike a balance in two major domains of their activity: *instruction*, as an *expert*, and *animation of the class*, as a mediator and leader. While the former is a straight-forward task, the latter is defined as a set of processes that allow the organization and coordination of the pupils' voluntary and collective efforts so that they achieve the goals, (personal, of the group and of the school). These aims are not merely cognitive, but also of an affective and social nature.

CONCLUSION

These conclusions back up the findings of other research already mentioned which underlines the negative correlation between age and the valuing of a "close" relation with the teacher. Other results, however, did not arrive at the same conclusions as the general tone of the research. Therefore, one has to admit that the question of repetition does not reflect, in differential form, on the kind of relations perceived by the pupils. Another contradictory fact is the issue of gender; according to the data obtained, gender seems not to exercise a differential effect on the relations perceived by the pupils with their teachers.

We aimed to show how questions of affectivity, understood as the ability to irradiate empathy, mutual respect, knowledge and belief in the capacities of others are basic competencies of teachers and pupils that make it possible to develop a high-quality pedagogical relation. In the ***first part***, we saw how the research has highlighted several domains in which these effects are shown, pointing out their influence on motivation and learning and a climate of healthy socialising. In ***the second*** and ***third parts***, a summary of two studies carried out - what most stands out is that, in the pupils' own words, effective teaching does not depend only on the scientific quality of the didactic procedures implemented but is strongly related to affectivity in the sense we attribute it above. We also reach the conclusion that through their professional competence, with regard to scientific, pedagogical and relational aspects, teachers can legitimise their influence on the pupil, stressing the importance of respect and openness to the "other". These findings allow us to put forward some suggestions concerning teacher education: (1) the relational aspect should be viewed as a major part of the initial training curriculum; (2) the professional development of the teachers is undertaken through interaction in work contexts; (3) training teachers means, above all, preparing people who will collaborate in the education of people undergoing development; which implies acquiring the ability to establish connections between the domains of cognitive learning and affectivity; endowing them with the ability, among other aspects, to actively listen to the "voice" of the pupil; (4) this has implications not only as regards the content and theoretical references but also in the selection of the very models of training, especially focusing on the reflexive models and those that strive to prepare future teachers through research.

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DOES THE PHILIPS CURVE EXIST? : Cross-Section Evidences from Allover the World

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ABSTRACT

This paper provides evidences that the Philips curve exists in the world's economy. The Philips curve depicted a negative correlation between the rate of inflation and unemployment rate. This dilemma has been a big problem faced by any government. Inflation cannot be eliminated without raising unemployment, at least for some time and moderate unemployment cannot be cut sharply without the risk of raising inflation. It was empirically evidence that this curve exist in the short-run. Inflation cannot be reduced without creating a recession. Using cross-section data on inflation rate and rate of unemployment from 182countries all over the world: 49 countries in Asia, 52 countries in Africa, 39 countries in Europe and 29 countries in America, this paper proved that there was a negative correlation between the rate of inflation and unemployment rate. It means that the Philipscurve do exists in economy, but the relationship between them was not statistically significant.

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INTRODUCTION

In economics, inflation is a sustained increase in the general price level of goods and services in an economy over a period of time (Blanchard, 2000; Dornbusch & Fischer, 1994). When the price level rises, each unit of currency buys fewer goods and services. Consequently, inflation reflects a reduction in the purchasing power per unit of money – a loss of real value in the medium of exchange and unit of account within the economy (Walgenbach, P.H., *et.al*., 1973). A chief measure of price inflation is the inflation rate, the annualized percentage change in a general price index, usually the consumer price index, over time (Mankiw, 2002). Inflation affects economies in various positive and negative ways. The negative effects of inflation include an increase in the opportunity cost of holding money, uncertainty over future inflation which may discourage investment and savings, and if inflation were rapid enough, shortages of goods as consumers begin hoarding out of concern that prices will increase in the future. Positive effects include reducing the real burden of public and private debt, keeping nominal interest rates above zero so that central banks can adjust interest rates to stabilize the economy, and reducing unemployment due to nominal wage rigidity (Mankiw, 2002).

Economists generally believe that high rates of inflation and hyperinflation are caused by an excessive growth of the money supply (Barro & Grilli, 1994). However, money supply growth does not necessarily cause inflation. Some economists maintain that under the conditions of a liquidity trap, large monetary injections are like "pushing on a string" (Makin, 2010; Krugman & Eggertsson, 2014). Views on which factors determine low to moderate rates of inflation are more varied. Low or moderate inflation may be attributed to fluctuations in real demand for goods and services, or changes in available supplies such as during scarcities. However, the consensus view is that a long sustained period of inflation is caused by money supply growing faster than the rate of economic growth (Mankiw, 2002; Abel & Bernanke, 2005).

Today, most economists favor a low and steady rate of inflation (Hummel, 2007). Low inflation reduces the severity of economic recessions by enabling the labor market to adjust more quickly in a downturn, and reduces the risk that a liquidity trap prevents monetary policy from stabilizing the economy (Lars, 2003). The task of keeping the rate of inflation low and stable is usually given to monetary authorities. Generally, these monetary authorities are the central banks that control monetary policy through the setting of interest rates, through open market operations, and through the setting of banking reserve requirements (Taylor, 2008).

Unemployment occurs when people who are without work are actively seeking paid work (ILO, 1982). The unemployment rate is a measure of the prevalence of unemployment and it is calculated as a percentage by dividing the number of unemployed individuals by all individuals currently in the labor force. During periods of recession, an economy usually experiences a relatively high unemployment rate (ILO, 2013). According to International Labour Organization (2013) report, more than 200 million people globally or 6% of the world's workforce were without a job in 2012.

There remains considerable theoretical debate regarding the causes, consequences and solutions for unemployment. Classical economics, New classical economics, and the Austrian School of economics argue that market mechanisms are reliable means of resolving unemployment. These theories

argue against interventions imposed on the labor market from the outside, such as unionization, bureaucratic work rules, minimum wage laws, taxes, and other regulations that they claim discourage the hiring of workers.Keynesian economics emphasizes the cyclical nature of unemployment and recommends government interventions in the economy that it claims will reduce unemployment during recessions. This theory focuses on recurrent shocks that suddenly reduce aggregate demand for goods and services and thus reduce demand for workers. Keynesian models recommend government interventions designed to increase demand for workers; these can include financial stimuli, publicly funded job creation, and expansionist monetary policies. Its namesake, economist John Maynard Keynes, believed that the root cause of unemployment is the desire of investors to receive more money rather than produce more products, which is not possible without public bodies producing new money (Dornbusch & Fisher, 1994).

The Phillips curve is a single-equation empirical model, named after A. W. Phillips, describing a historical inverse relationship between rates of unemployment and corresponding rates of inflation that result within an economy. Stated simply, decreased unemployment, in an economy will correlate with higher rates of inflation.While there is a short run tradeoff between unemployment and inflation, it has not been observed in the long run (Chang, 1997). In 1968, Milton Friedman asserted that the Phillips curve was only applicable in the short-run and that in the long-run, inflationary policies will not decrease unemployment (Friedman, 1968*;* Phelan, 2012). Friedman then correctly predicted that, in the 1973–75 recession, both inflation and unemployment would increase (Phelan, 2012). The long-run Phillips Curve is now seen as a vertical line at the natural rate of unemployment, where the rate of inflation has no effect on unemployment.Accordingly, the Phillips curve is now seen as too simplistic, with the unemployment rate supplanted by more accurate predictors of inflation based on velocity of moneysupply measures such as the MZM ("money zero maturity") velocity, which is affected by unemployment in the short but not the long term (Hossfeld, 2010).

This paper is aimed to examine the existence of Philips curve in the world's economy using cross section data from Asian economies (49 countries, African economies (52 countries), European economies (39 countries) and American economies (29 countries).

LITERATURE REVIEWS

Inflation

The term "inflation" originally referred to increases in the amount of money in circulation (Chisholm, ed., 1922) and some economists still use the word in this way. However, most economists today use the term "inflation" to refer to a rise in the price level. An increase in the money supply may be called monetary inflation, to distinguish it from rising prices, which may also for clarity be called "price inflation". Economists generally agree that in the long run, inflation is caused by increases in the money supply.

Conceptually, inflation refers to the general trend of prices, not changes in any specific price. For example, if people choose to buy more cucumbers than tomatoes, cucumbers consequently become more expensive and tomatoes cheaper. These changes are not related to inflation, they reflect a shift in tastes. Inflation is related to the value of currency itself. When currency was linked with the gold, if new gold deposits were found, the price of gold and the value of currency would fall, and consequently prices of all other goods would become higher. Rapid increases in quantity of the money or in the overall money supply (or debasement of the means of exchange) have occurred in many different societies throughout history, changing with different forms of money used (Dobson, 2002 ;Harl, 1996). For instance, when gold was used as currency, the government could collect gold coins, melt them down, mix them with other metals such as silver, copper or lead, and reissue them at the same nominal value. By diluting the gold with other metals, the government could issue more coins without also needing to increase the amount of gold used to make them. When the cost of each coin is lowered in this way, the government profits from an increase in seigniorage. This practice would increase the money supply but at the same time the relative value of each coin would be lowered. As the relative value of the coins becomes lower, consumers would need to give more coins in exchange for the same goods and services as before. These goods and services would experience a price increase as the value of each coin is reduced.

Song Dynasty China introduced the practice of printing paper money in order to create fiat currency (von Glahn., 1996*)*. During the Mongol Yuan Dynasty, the government spent a great deal of money fighting costly wars, and reacted by printing more money, leading to inflation (Ropp, 2010). Fearing the inflation that plagued the Yuan dynasty, the Ming Dynasty initially rejected the use of paper money, and reverted to using copper coins (Bernholz, 2003).

Historically, large infusions of gold or silver into an economy also led to inflation. From the second half of the 15th century to the first half of the 17th, Western Europe experienced a major inflationary cycle referred to as the "price revolution" (Hamilton, 1934; Munro, 2009) with prices on average rising perhaps sixfold over 150 years. This was largely caused by the sudden influx of gold and silver from the New World into Habsburg Spain (Walton, 1994*)*. The silver spread throughout a previously cash-starved Europe and caused widespread inflation (Tracy, J.D., 1994*)*. Demographic factors also contributed to upward pressure on prices, with European population growth after depopulation caused by the Black Death pandemic.By the nineteenth century, economists categorized three separate factors that cause a rise or fall in the price of goods: a change in the value or production costs of the good, a change in the price of money which then was usually a fluctuation in the commodity price of the metallic content in the currency, and currency depreciation resulting from an increased supply of currency relative to the quantity of redeemable metal backing the currency. Following the proliferation of private banknote currency printed during the American Civil War, the term "inflation" started to appear as a direct reference to the currency depreciation that occurred as the quantity of redeemable banknotes outstripped the quantity of metal available for their redemption. At that time, the term inflation referred to the devaluation of the currency, and not to a rise in the price of goods.

This relationship between the over-supply of banknotes and a resulting depreciation in their value was noted by earlier classical economists, who would go on to examine and debate

what effect monetary inflation has on the price of goods,later termed as inflation.

The inflation rate is widely calculated by calculating the movement or change in a price index, usually the consumer price index (Blanchard, 2000). The inflation rate is the percentage rate of change of a price index over time. The Retail Prices Index is also a measure of inflation that is commonly used in the United Kingdom. It is broader than the CPI and contains a larger basket of goods and services.To illustrate the method of calculation, in January 2007, the U.S. Consumer Price Index was 202.416, and in January 2008 it was 211.080. The formula for calculating the annual percentage rate inflation in the CPI over the course of the year is: The resulting inflation rate for the CPI in this one-year period is 4.28%, meaning the general level of prices for typical U.S. consumers rose by approximately four percent in 2007. Other widely used price indices for calculating price inflation include Producer Price Indices (PPIs) and Commodity Price Indices (CPI). PPIs measures average changes in prices received by domestic producers for their output. This differs from the CPI in that price subsidization, profits, and taxes may cause the amount received by the producer to differ from what the consumer paid. There is also typically a delay between an increase in the PPI and any eventual increase in the CPI. Producer price index measures the pressure being put on producers by the costs of their raw materials. This could be "passed on" to consumers, or it could be absorbed by profits, or offset by increasing productivity. In India and the United States, an earlier version of the PPI was called the Wholesale Price Index. Commodity price indices measure the price of a selection of commodities. In the present commodity price indices are weighted by the relative importance of the components to the "all in" cost of an employee.

Unemployment

The state of being without any work both for educated & uneducated person for earning one's livelihood is meant by unemployment. Economists distinguish between various overlapping types of and theories of unemployment, including cyclical or Keynesian unemployment, frictional unemployment, structural unemployment and classical unemployment. Some additional types of unemployment that are occasionally mentioned are seasonal unemployment, hardcore unemployment, and hidden unemployment.

Many economists have argued that unemployment increases with increased governmental regulation. For example, minimum wage laws raise the cost of some low-skill laborers above market equilibrium, resulting in increased unemployment as people who wish to work at the going rate cannotas the new and higher enforced wage is now greater than the value of their labor (Hayek,1960). *Laws* restricting layoffs may make businesses less likely to hire in the first place, as hiring becomes more risky (Anderton, 2006). However, this argument overly simplifies the relationship between wage rates and unemployment, ignoring numerous factors, which contribute to unemployment (Garegnani, 1970; Vienneau, 2005; Opocher Steedman, 2009; Anyadike-Danes & Godley, 1989; White, 2001). Some, such as Murray Rothbard, suggest that even social taboos can prevent wages from falling to the market-clearing level (Rothbard, 1963).

Vedder & Gallaway (1997) argue that the empirical record of wages rates, productivity, and unemployment in American validates classical unemployment theory. Their data shows a strong correlation between adjusted real wage and unemployment in the United States from 1900 to 1990. However, they maintain that their data does not take into account exogenous events.

Cyclical unemployment occurs when there is not enough aggregate supply in the economy to provide jobs for everyone who wants to work. Demand for most goods and services falls, less production is needed and consequently fewer workers are needed, wages are sticky and do not fall to meet the equilibrium level, and mass unemployment results (Keynes, 2007*)*. Its name is derived from the frequent shifts in the business cycle. Keynesian economists see the lack of supply for jobs as potentially resolvable by government intervention. One suggested interventions involves deficit spending to boost employment and demand. Another intervention involves an expansionary monetary policy that increases the supply of money which should reduce interest rates which should lead to an increase in non-governmental spending (Harris, (2005).

Marxists also share the Keynesian viewpoint of the relationship between economic demand and employment, but with the caveat that the market system's propensity to slash wages and reduce labor participation on an enterprise level causes a requisite decrease in aggregate demand in the economy as a whole, causing crises of unemployment and periods of low economic activity before the capital accumulation (investment) phase of economic growth can continue (Marx, 1863*)*. According to Karl Marx (2009), unemployment is inherent within the unstable capitalist system and periodic crises of mass unemployment are to be expected. The function of the proletariat within the capitalist system is to provide a "reserve army of labour" that creates downward pressure on wages. This is accomplished by dividing the proletariat into surplus labour and under-employment (Marx, 2009). This reserve army of labour fight among themselves for scarce jobs at lower and lower wages.According to Marx, the only way to permanently eliminate unemployment would be to abolish capitalism and the system of forced competition for wages and then shift to a socialist or communist economic system. For contemporary Marxists, the existence of persistent unemployment is proof of the inability of capitalism to ensure full employment.

There are also different ways national statistical agencies measure unemployment. These differences may limit the validity of international comparisons of unemployment data (Sorrentino, C., 2000). To some degree these differences remain despite national statistical agencies increasingly adopting the definition of unemployment by the International Labour Organization. To facilitate international comparisons, some organizations, such as the OECD, Eurostat, and International Labor Comparisons Program, adjust data on unemployment for comparability across countries.Though many people care about the number of unemployed individuals, economists typically focus on the unemployment rate. This corrects for the normal increase in the number of people employed due to increases in population and increases in the labour force relative to the population. The unemployment rate is expressed as a percentage, and is

calculated as: unemployment rate = (unemployment workers/total labour force) x 100%.

As defined by the International Labour Organization, "unemployed workers" are those who are currently not working but are willing and able to work for pay, currently available to work, and have actively searched for work. Individuals who are actively seeking job placement must make the effort to be in contact with an employer, have job interviews, contact job placement agencies, send out resumes, submit applications, respond to advertisements, or some other means of active job searching within the prior four weeks. Simply looking at advertisements and not responding will not count as actively seeking job placement. Since not all unemployment may be "open" and counted by government agencies, official statistics on unemployment may not be accurate (Zuckerman, 2002*)*. In the United States, for example, the unemployment rate does not take into consideration those individuals who are not actively looking for employment, such as those still attending college (Coy, 2012).

The ILO describes 4 different methods to calculate the unemployment rate, namely : Labour Force Sample Surveys, Official Estimates, Social Insurance Statisticsand Employment Office Statistics.This method also includes unemployed who are not unemployed per the ILO definition.

Philips Curve

William Phillips (1958) wrote a paper untittle *The Relation between Unemployment and the Rate of Change of Money Wage Rates in the United Kingdom, 1861-1957*, which was published in the quarterly journal.In the paper Phillips describes how he observed an inverse relationship between money wage changes and unemployment in the British economy over the period examined. Similar patterns were found in other countries and Samuelson&Solow (1960) took Phillips' work and made explicit the link between inflation and unemployment: when inflation was high, unemployment was low, and vice versa.In the 1920s, an American economist Fisher (1973) noted this kind of Phillips curve relationship. However, Phillips' original curve described the behavior of money wages.In the years following Phillips' 1958 paper, many economists in the advanced industrial countries believed that his results showed that there was a permanently stable relationship between inflation and unemployment.One implication of this for government policy was that governments could control unemployment and inflation with a Keynesian policy. They could tolerate a reasonably high rate of inflation as this would lead to lower unemployment – there would be a trade-off between inflation and unemployment. For example, monetary policy and/or fiscal policy could be used to stimulate the economy, raising gross domestic product and lowering the unemployment rate. Moving along the Phillips curve, this would lead to a higher inflation rate, the cost of enjoying lower unemployment rates. Economist James Forder (2014) argues that this view is historically false and that neither economists nor governments took that view and that the 'Phillips curve myth' was an invention of the 1970s (Forder, 2014). Since 1974, seven Nobel Prizes have been given to economists for, among other things, work critical of some variations of the Phillips curve. Some of this criticism is based on the United States' experience during the 1970s, which had periods of high unemployment and high inflation at the same time. The authors receiving those prizes include Thomas Sargent, Christopher Sims, Edmund Phelps, Edward Prescott, Robert A. Mundell, Robert E. Lucas, Milton Friedman, and F.A. Hayek (Domitrovic, 2011).

Most economists no longer use the Phillips curve in its original form because it was shown to be too simplistic (Hossfeld, 2010). This can be seen in a cursory analysis of US inflation and unemployment data from 1953–92. There is no single curve that will fit the data, but there are three rough aggregations—1955–71, 1974–84, and 1985–92—each of which shows a general, downwards slope, but at three very different levels with the shifts occurring abruptly. The data for 1953–54 and 1972–73 do not group easily, and a more formal analysis posits up to five groups/curves over the period (Chang 1997). But still today, modified forms of the Phillips Curve that take inflationary expectations into account remain influential. The theory goes under several names, with some variation in its details, but all modern versions distinguish between short-run and long-run effects on unemployment. Modern Phillips curve models include both a short-run Phillips Curve and a long-run Phillips Curve. This is because in the short run, there is generally an inverse relationship between inflation and the unemployment rate; as illustrated in the downward sloping short-run Phillips curve. In the long run, that relationship breaks down and the economy eventually returns to the natural rate of unemployment regardless of the inflation rate (Reed, 2016).

The "short-run Phillips curve" is also called the "expectations-augmented Phillips curve", since it shifts up when inflationary expectations raise (Friedman, M., 1968). In the long run, this implies that monetary policy cannot affect unemployment, which adjusts back to its "natural rate", or "long-run Phillips curve". However, this long-run "neutrality" of monetary policy does allow for short run fluctuations and the ability of the monetary authority to temporarily decrease unemployment by increasing permanent inflation, and vice versa. The popular textbook of Blanchard (2000) gives a textbook presentation of the expectations-augmented Phillips curve. An equation like the expectations-augmented Phillips curve also appears in many recent New Keynesian dynamic stochastic general equilibrium models. In these macroeconomic models with sticky prices, there is a positive relation between the rate of inflation and the level of demand, and therefore a negative relation between the rate of inflation and the rate of unemployment. This relationship is often called the "New Keynesian Phillips curve". Like the expectations-augmented Phillips curve, the New Keynesian Phillips curve implies that increased inflation can lower unemployment temporarily, but cannot lower it permanently. Two influential papers that incorporate a New Keynesian Phillips curve Galí & Gertler (1999), and Blanchard & Galí (2007).

DATA AND METHOD OF ANALYSIS

Data for this cross-section study were collected from http://www.tradingeconomics.com/ country-list/inflation-rate for inflation rate data and from http://www. tradingeconomics. com/ country-list/unemployment-ratefor unemployment rate data. In Asian data on inflation rate and unemployment rate were collected from 49 countries. In Africa, data on inflation rate and unemployment rate were collected from 52 countries, in Europe data on inflation rate and unemployment rate were collected from 39 countries and

in America data on inflation rate and unemployment rate were collected from 29 countries.

To prove the existence of the Philips curve in each economy, regression analysis was employed. If Y = inflation rate, and X = unemployment rate, the $y= x^{-e}$, so ln Y = -ln X, as data of Y and X were available, regression analysis could easily be calculated. Regression coefficients and their t-statistic were then analyzed to prove the existence of the Philips curve.

RESULTS AND DISCUSSION

In Asian countries, the scatter diagram between inflation rate and the rate of unemployment (49 countries) is presented in Figure 1. Regression analysis between inflation rate (%) and the rate of unemployment (%) showed that there was a negative relation between them, as indicated by a negative regression coefficient (-0.04). This correlation was not statistically significant as P-value more than 0.05 and t-statistics (-0.22) less than t-table (2.02 at 95% confident level, n=49).

Figure 2 presents the scatter diagram between inflation rate and the rate of unemployment in Africa (52 countries). Regression analysis between inflation rate (%) and the rate of unemployment (%) showed that there was a negative relation between them, as indicated by a negative regression coefficient (-2.17). This correlation was not statistically significant as P-value more than 0.05 and t-statistics (-0.32) less than t-table (2.01 at 95% confident level, n=52).

In European countries, the scatter diagram between inflation rate and the rate of unemployment (39 countries) is presented in Figure 3. Regression analysis between inflation rate (%) and the rate of unemployment (%) showed that there was a negative relation between them, as indicated by a negative regression coefficient (-0.12). This correlation was not statistically significant as P-value more than 0.05 and t-statistics (-2.14) less than t-table (2.03, at 95% confident level, n=39).

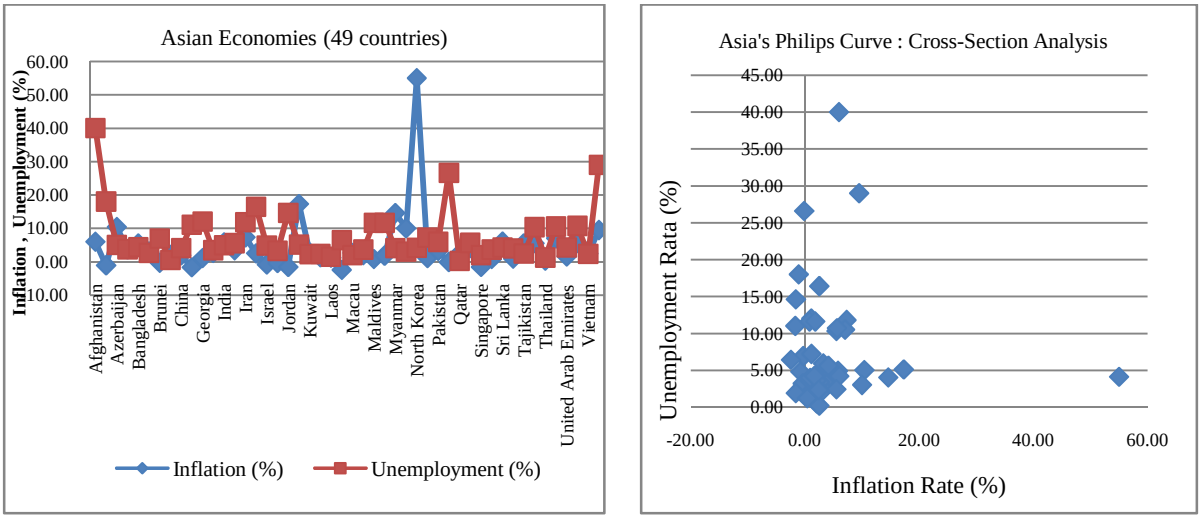

Figure 1. Inflation Rate, Unemployment Rate andthe Scatter Diagram to Predict The Existence of the Philips Curve in the Asian Economies

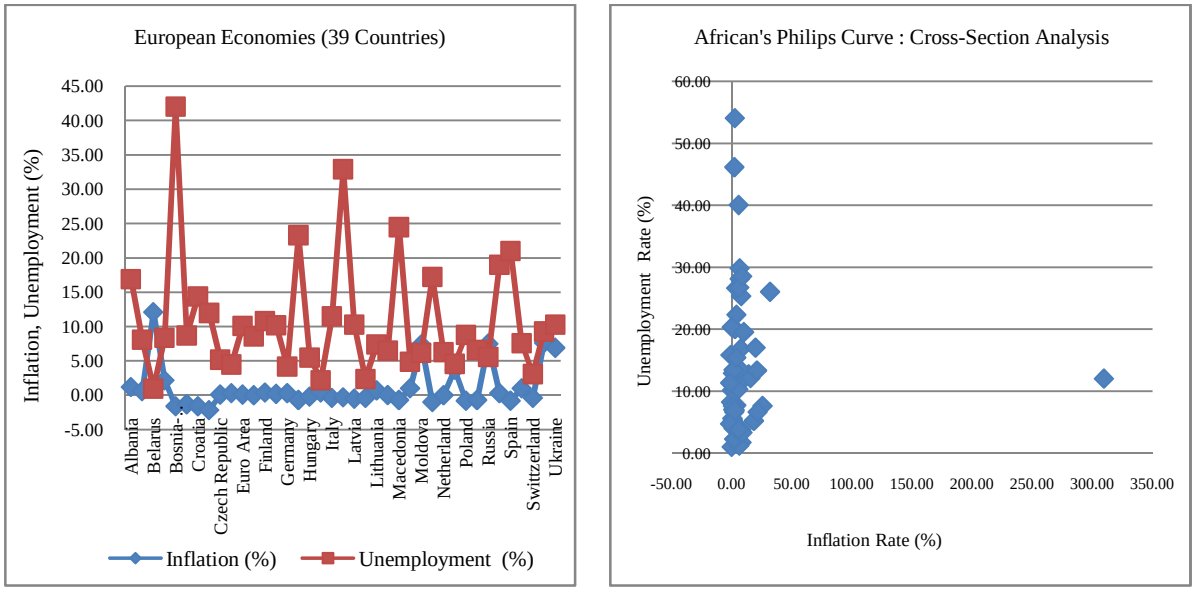

Figure 2 Inflation Rate, Unemployment Rate and the Scatter Diagram to Predict the Existence of the Philips Curve in the African Economies

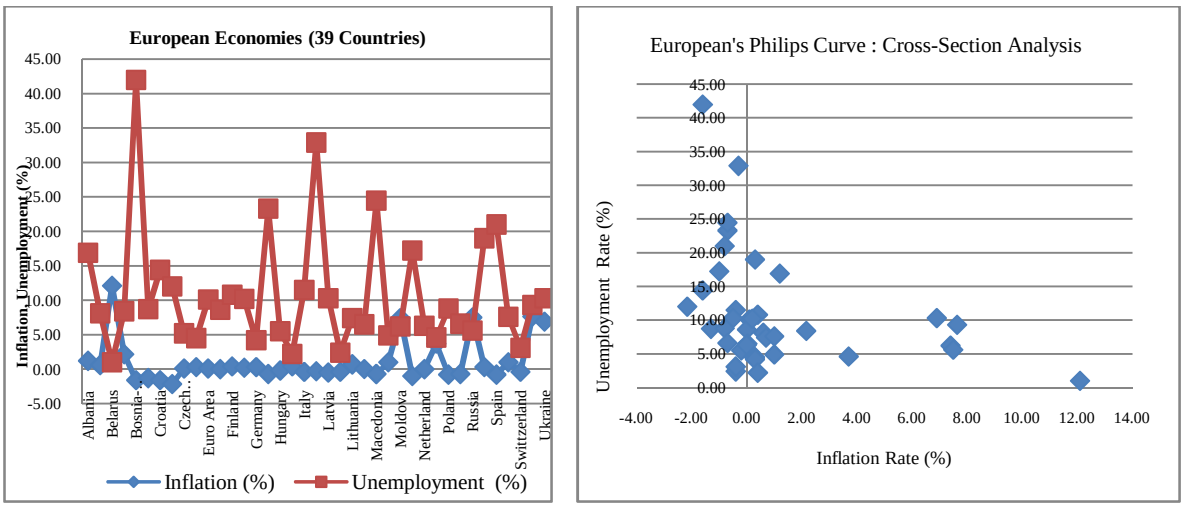

Figure 3 Inflation Rate, Unemployment Rate and the Scatter Diagram to Predict the Existence of Philips Curve in the European Economies

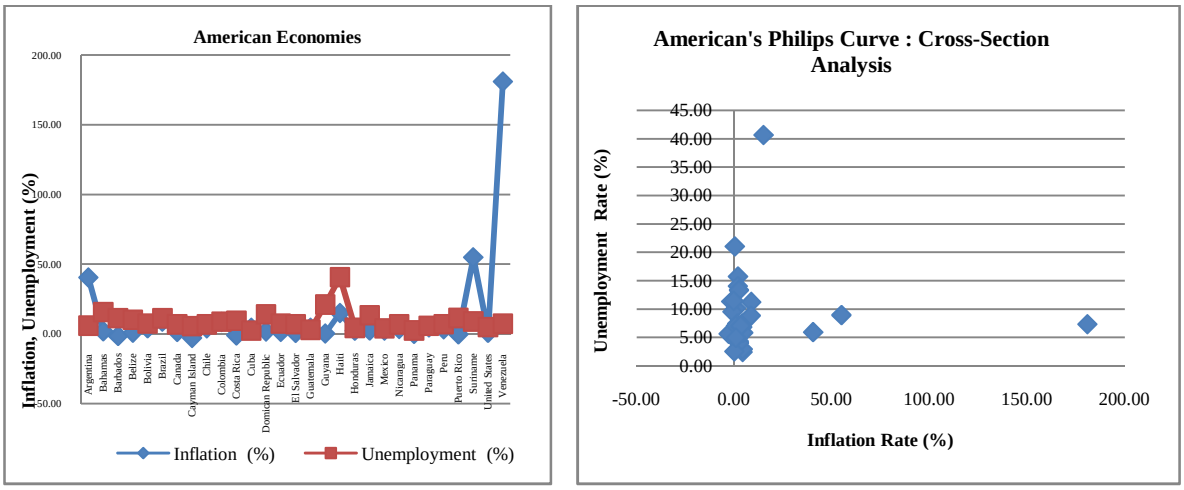

Figure 4 Inflation Rate, Unemployment Rate and the Scatter Diagram to Predict the Existence of the Philips Curve in the American Economies

Figure 4 presents the scatter diagram between inflation rate dan the rate of unemployment in the American economies (29 countries). Regression analysis between inflation rate (%) and the rate of unemployment (%) showed that there was a negative relation between them, as indicated by a negative regression coefficient (-0.64). This correlation was not statistically significant as P-value more than 0.05 and t-statistics (-0.06) less than t-table (2.05 at 95% confident level, n=29).

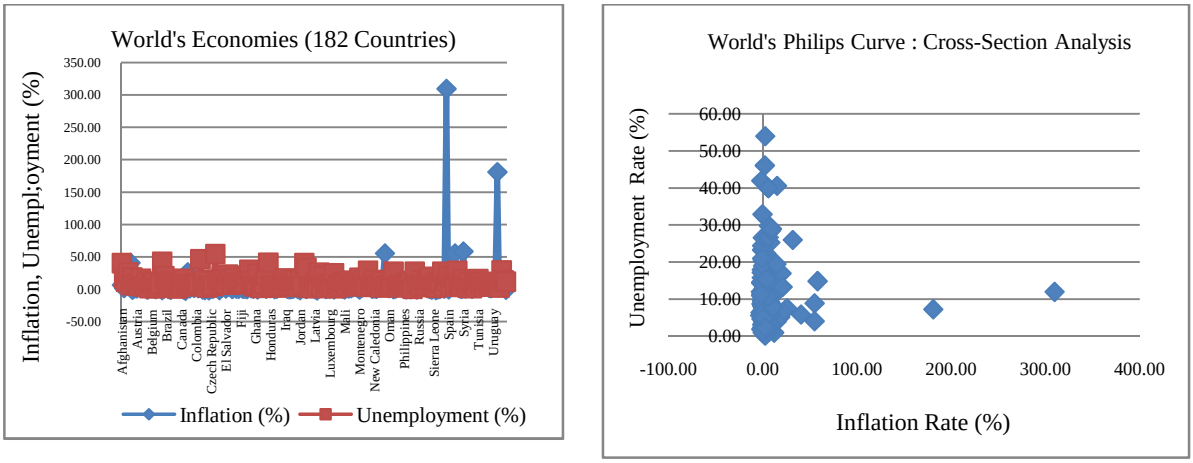

Figure 5 Inflation Rate, Unemployment Rate and the Scatter Diagram to Predict The Existence of the Philips Curve in the World's Economies

Finally, Figure 5 provides scatter diagram between inflation rate and the rate of unemployment for all over the world's economies (182 countries). Regression analysis between inflation rate (%) and the rate of unemployment (%) showed that there was a negative relation between them, as indicated by a negative regression coefficient (-1.59). This correlation was not statistically significant as P-value more than 0.05 and t-statistics (-0.67) less than t-table (1.96 at 95% confident level, n=182).

CONCLUSION

It could be concluded that firstly the Philips curve exist in Asian economies as indicated by a negative correlation between the rate of inflation and the inflation rate.The regression coefficient was -0.04; t-test showed that the regression coefficient was not statistically significant. Secondly, in African economies, the Philip curve also exists as there was a negative correlation between the rate of inflation and the inflation rate. The regression coefficient was -2.17; t-test showed that the regression coefficient was not statistically significant. Thirdly, in European countries, the Philip curve also exists as there was a negative correlation between the rate of inflation and the inflation rate. The regression coefficient was -0.12; t-test showed that the regression coefficient was not statistically significant. Fourthly, in American economy, the Philip curve also exists as there was a negative correlation between the rate of inflation and the inflation rate. The regression coefficient was -0.64; t-test showed that the regression coefficient was not statistically significant. Finally, it could be concluded that the Philip curve does exists in the world's economy, but the existence was not statistically significant.

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RESEARCH ARTICLE

ECONOMIC DEVELOPMENT AND HAPPINESS: A CROSS-NATIONS PATH ANALYSIS.

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Abstract

This paper analysis direct and indirect impacts of economic development indicators that consist of economic growth, human development and global competitiveness, on happiness. Cross-section data on economic growth, human development, global competitiveness and happiness were collected from 123 countries and employed to a path analysis model. The result showed that directly, in Path-1 the impact of economic growth on happiness was negative and significant. Indirectly, the impacts of economic growth on happiness varied depend on the path. In Path-7, P_{43}-P_{31}, the impact of economic growth on happiness through global competitiveness was positive and significant. In Path-8, P_{43}-P_{32}-P_{21}, the impact of economic growth on happiness through global competitiveness and human development was negative, but statistically was not significant. Finally, in Path-9, P_{42}-P_{21}, the impact of economic growth on happiness through human development was negative but statistically was not significant. The implication of this finding was that economic growth no longer important factor in development, especially when development aimed to make people happy.

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Introduction

Happiness has become one of important indicators of social progress. Happiness is now the ultimate goal of development. United Nations Development Programme updated the World Happiness Report 2016 which is a landmark survey of the state of global happiness (Helliwell, J. *et al*, 2016). The report was released on March 20th on UN Happiness Day. The first World Happiness Report was published in April 2012, in support of the High Level Meeting at the United Nations on happiness and well-being, chaired by the Prime Minister of Bhutan. The report outlined the state of world happiness, causes of happiness and misery, and policy implications highlighted by case studies. In September 2013 the second World Happiness Report offered the first annual follow-up and reports are now issued every year.

According to Hornby (1985), happiness is a mental or emotional state of well-being defined by positive or pleasant emotions ranging from contentment to intense joy. The Merriam Webster online dictionary defines happiness as a state of well-being or contentment, a pleasurable or satisfying experience. Happy mental states may also reflect judgments by a person about their overall well-being (Anand, P., 2016). Happiness is a fuzzy concept and can mean many different things to many people. Related concepts are well-being, quality of life and flourishing. At least one author defines happiness as contentment (Graham, M. C., 2014). Some commentators focus on the difference

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between the hedonistic tradition of seeking pleasant and avoiding unpleasant experiences, and the eudaimonic tradition of living life in a full and deeply satisfying way (Deci, E.L. & Ryan, R. M., 2006). Algoe, S. & Haidt, J., (2009) say that happiness may be the label for a family of related emotional states, such as joy, amusement, satisfaction, gratification, euphoria, and triumph.

It has been argued that happiness measures could be used not as a replacement for more traditional measures, but as a supplement (Weiner, E. J., 2007). Several scales have been used to measure happiness, such as: the SHS (Subjective Happiness Scale) is a four-item scale, measuring global subjective happiness (Lyubomirsky, S. & Lepper, H. S., 1999).The PANAS (Positive and Negative Affect Schedule) is used to detect the relation between personality traits and positive or negative affects at this moment, today, the past few days, the past week, the past few weeks, the past year, and generally (on average). The SWLS (Satisfaction with Life Scale) is a global cognitive assessment of life satisfaction developed by Diener, E, *et.al*, (1985).

Economic development indicator initially starting with economic growth, then human development focused and competitiveness. The first development indicator related to happiness indicated by Gross Domestic Product (GDP), which is the measure of economic growth (Frey, B. S. & Stutzer, A., 2001). Economic growth is the increase in the inflation-adjusted market value of the goods and services produced by an economy over time. It is conventionally measured as the percent rate of increase in real gross domestic product (real GDP), usually in per capita terms (IMF, 2012). Growth is usually calculated in real terms to eliminate the distorting effect of inflation on the price of goods produced. Since economic growth is measured as the annual percent change of gross domestic product (GDP), it has all the advantages and drawbacks of that measure. The rate of economic growth refers to the geometric annual rate of growth in GDP between the first and the last year over a period of time. Implicitly, this growth rate is the trend in the average level of GDP over the period, which implicitly ignores the fluctuations in the GDP around this trend. An increase in economic growth caused by more efficient use of inputs is referred to as intensive growth. GDP growth caused only by increases in the amount of inputs available for use is called extensive growth.

Theories and models of economic growth among others: Classical Growth Theory of Ricardian which is originally Thomas Maltus theory about agriculture (Bjork, G.J., 1999), Solow-Swan Model developed by Sollow, R., (1956) and Swan, T., (1956), Endogenous Growth Theory which focus on what increases human capital or technological change (Helpman, E., 2004), Unified Growth Theory developed by Galor, O., (2005), The Big Push Theory which is popular in 1940s, Schumpeterian Growth Theory which is entrepreneurs introduce new products or processes in the hope that they will enjoy temporary monopoly-like profits as they capture markets (Aghion, P., 2002), Institutions and Growth Theory (Acemoglu, *at.al*, 2001), Human Capital and Growth Theory (Barro & Lee, 2001).

Economic growth had been a single development indicator for many years before the concept of human development was introduced. Human development is a concept within a field of international development. The human development approach, developed by the economist Mahbub Ul-Haq (2003), is anchored in Nobel Laureate Amartya Sen's work on human capabilities (Sen, 2005). It involves studies of the human condition, with its core being the capability approach. The inequality adjusted Human Development Index is used as a way of measuring actual progress in human development by the United Nations Development Programme (1997). It is an alternative approach to a single focus on economic growth, and focused more on social justice, as a way of understanding progress. The concept of human developments was first laid out by Zaki Bade, a 1998 Nobel Laureate, and expanded upon by Nussbaum (2000; 2011), and Alkire (1998). Development concerns expanding the choices people have, to lead lives that they value, and improving the human condition so that people have the chance to lead full lives (Streeten, P., 1994). Thus, human development is about much more than economic growth, which is only a means of enlarging people's choices. Fundamental to enlarging these choices is building human capabilities. Capabilities are the substantive freedoms people enjoy; to lead a kind of life they have reason to value (World Health Organization, 2016). Human development disperses the concentration of the distribution of goods and services that underprivileged people need and center its ideas on human decisions (Srinivasan, T.N., 1994). By investing in people, we enable growth and empower people to pursue many different life paths, thus developing human capabilities. The most basic capabilities for human development are to lead long and healthy lives, to be knowledgeable, to have access to the resources and social services needed for a decent standard of living, and to be able to participate in the life of the community. Without these, many choices are simply not available, and many opportunities in life remain inaccessible.

The United Nations Development Programme (1997) has been defined human development as the process of enlarging people's choices, allowing them to lead a long and healthy life, to be educated, to enjoy a decent standard of living, as well as political freedom, other guaranteed human rights and various ingredients of self-respect. One measure of human development is the Human Development Index (HDI), formulated by the United Nations Development Programme (2015a). The index encompasses statistics such as life expectancy at birth, an education index calculated using mean years of schooling and expected years of schooling, and gross national income per capita. Though this index does not capture every aspect that contributes to human capability, it is a standardized way of quantifying human capability across nations and communities. Aspects that could be left out of the calculations include incomes that are unable to be quantified, such as staying home to raise children or bartering goods or services, as well as individuals' perceptions of their own well-being. The Human Development Index (HDI) is a summary measure of average achievement in key dimensions of human development: a long and healthy life, being knowledgeable, and have a decent standard of living. The HDI is the geometric mean of normalized indices for each of the three dimensions (United Nation Development Program, 2015b).

Basically, the fundamental goal of economic development policy is to enhance competitiveness, which is reflected in the productivity with which a nation or region utilizes its people, capital, and natural endowments to produce valuable goods and services (Porter, 2009). However, competitiveness has been defined diversely. Scholars and institutions have been very prolific in proposing their own definition of competitiveness. According to Institute for Management Development (2003), competitiveness was a field of economic knowledge, which analyses the facts and policies that shape the ability of a nation to create and maintain an environment that sustains more value creation for its enterprises and more prosperity for its people. Competitiveness is the ability of a country to achieve sustained high rates of growth in GDP per capita (World Economic Forum, 1996). But According to Feurer, R. and Chaharbaghi, K., (1995) competitiveness is relative, not absolute. It depends on shareholder and customer values, financial strength which determines the ability to act and react within the competitive environment and the potential of people and technology in implementing the necessary strategic changes. National competitiveness refers to a country's ability to create, produce, distribute and/or service products in international trade while earning rising returns on its resources (Scott, B. R. and Lodge, G. C., 1985). Competitiveness includes both efficiency (reaching goals at the lowest possible cost) and effectiveness (having the right goals). It is this choice of industrial goals which is crucial. Competitiveness includes both the ends and the means towards those ends (Buckley, P. J. *et.al*, 1998).

In recent years, the concept of competitiveness has emerged as a new paradigm in economic development. Competitiveness captures the awareness of both the limitations and challenges posed by global competition, at a time when effective government action is constrained by budgetary constraints and the private sector faces significant barriers to competing in domestic and international markets. The Global Competitiveness Report of the World Economic Forum (2010) defines competitiveness as "the set of institutions, policies, and factors that determine the level of productivity of a country". The term is also used to refer in a broader sense to the economic competitiveness of countries, regions or cities. Competitiveness is important for any economy that must rely on international trade to balance import of energy and raw materials. The European Union (EU) has enshrined industrial research and technological development (R&D) in her Treaty in order to become more competitive. The way for the EU to face competitiveness is to invest in education, research, innovation and technological infrastructures (Muldur, U., *et.al*, 2006; Stajano, A., (2010). The International Economic Development Council (IEDC) in Washington, D.C. published the "Innovation Agenda: A Policy Statement on American Competitiveness". International comparisons of national competitiveness are conducted by the World Economic Forum, in its Global Competitiveness Report, and the IMD (2003), in its World Competitiveness Yearbook (2003). The Global Competitiveness Report (GCR, 2014-2015) is a yearly report published by the World Economic Forum (2015). Since 2004, the *Global Competitiveness Report* ranks countries based on the Global Competitiveness Index (GCR, 2014-2015), developed by Xavier, M, S., and Artadi, E.V., (2004). The *Global Competitiveness Index* integrates the macroeconomic and the micro aspects of competitiveness into a single index.

The impact of technological progress, economic growth and human development on Indonesia's global competitiveness has been reported by Muchdie, *et.al*, (2016). The impact of technological progress and economic growth on human development, using Indonesian data, has also been analyzed by Muchdie (2016a). Using cross-nations data, Muchdie (2016b) has analyzed the correlation as well as the impact of economic growth and human development on global competitiveness.

The objective of this paper is to report a research that is aimed to study the impact of economic development indicators, such as economic growth, human development and global competitiveness on happiness, using a cross-nations path model.

Methods of Analysis

In analyzing the impacts of economic development indicators on happiness, this study employed path analysis model, that was developed by Sewall Wright, who wrote about it extensively in the 1920s and 1930s (Wright, S., 1921; 1934). It has since been applied to a vast array of complex modeling areas, including biology, psychology, sociology, and econometrics (Dodge, Y., 2003). Basically, the path model can be used to analysis two types of impacts: direct and direct impacts. The total impacts of exogenous variables are the multiplication (Alwin, D.F., & Hauser, R.M., 1975). In this study, the path model is depicted in Figure 1: where human development and global competitiveness were the exogenous variables.

Six hypotheses of direct impacts and three hypotheses on indirect impact to be tested were: first, economic growth had direct impact on the happiness (Path-1); second, economic growth had direct impact on global competitiveness (Path-2); third, economic growth had direct impact on human development (Path-3); fourth, human development had direct impact on global competitiveness (Path-4), fifth, human development had direct impact on happiness (Path-5), and sixth, global competitiveness had direct impact on happiness (Path-6). Indirectly, economic growth had indirect impact on the happiness, through global competitiveness (Path-7); economic growth had indirect impact through global competitiveness and human development (Path-8), and economic growth had indirect impact of happiness, through human development (Path-9).

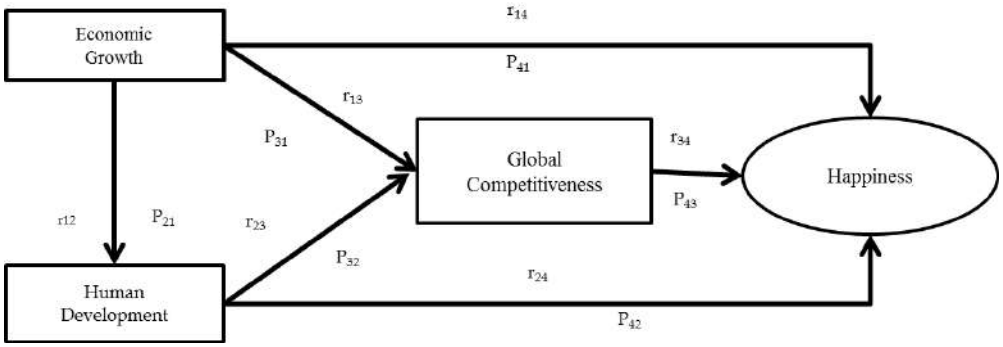

Figure 1: Path Model to Analysis the Impact of Economic Development on Happiness

Path coefficients were calculated by solving these path equations; given that the coefficients of correlation have been calculated. P_{41} was direct impact of economic growth on happiness; P_{31} was direct impact of economic growth on global competitiveness; P_{21} was direct impact of economic growth on human development; P_{32} was direct impact of human development on global competitiveness, and P_{42} was direct impact of human development on happiness. Indirect impact of economic growth on happiness, through global competitiveness was in Path-7 (P_{43} - P_{31}); Path-8 (P_{43} - P_{32} - P_{21}) was indirect impact of economic growth on happiness, through global competitiveness and human development; Path-9 (P_{42} -P_{21}) was indirect impact of economic growth on happiness, through human development.

Table1 1: Path Equations

1). $r_{12} = p_{21}$ Direct efect (DE)	4). $r_{14} = p_{41} + p_{42}\, r_{12} + p_{43}\, r_{13}$ Direct effect + Indirect effect (IE)
2). $r_{13} = p_{31} + p_{32}\, r_{12}$ Direct effect (DE) + Indirect efect (IE)	5). $r_{24} = p_{41}\, r_{12} + p_{42} + p_{43}\, r_{23}$ Direct effect (DE) + Indirect effect (IE) + Spurious (S)
3). $r_{23} = p_{31}\, r_{12} + p_{32}$ Spuriuos effect (S) + Direct effect (DE)	6). $r_{34} = p_{41}\, r_{13} + p_{42}\, r_{23} + p_{43}$ Direct effect (DE) + Spurious (S)

Source: http://faculty.cas.usf.edu/mbrannick/regression/Pathan.html

Happiness was measured by happiness index, economic growth was measured by the growth of GDP, human development was measured by the human development index and competitiveness was measured by global competitiveness index. Data on the happiness index from 156 countries was downloaded from UNDP (2016) World

Happiness Report, Chapter 2: The Distribution of World Happiness written by John F. Helliwell, Haifang Huang and Shun Huang. Data are available at http://worldhappiness.report/wp-content/ uploads/ sites /2/2016/03/HR-V1Ch2_web.pdf. Data on economic growth from 178 countries downloaded from World Bank (2016) Annual Gross Domestic Product Growth (%) and available at http: //data. worldbank.org/indicator/NY.GDP.MKTP.KD.ZG. Data on human development index from 155 countries download from UNDP (2016) Human Development Report 2015: Work for Human Development Web Version and was accessed at http://hdr.undp.org/en/data. Data on global competitiveness index from 138 countries were downloaded from http://reports.weforum.org/global-competitiveness-index/.

Problems of missing data have been solved by deleting countries with incomplete data. Finally, data on happiness, global competitiveness, human development, and economic growth used in this study were from 123 countries.

Results and Discussion

Figure 2: depicts the dynamic of economic growth, human development index, global competitiveness index and happiness index from 123 countries being studied. The lowest economic growth happened at Siera Leone (-20.3%) and the highest economic growth was at Mauritania (15.5%). Ten countries with the highest economic growth were Mauritania, Iran Islamic Republic, Ethiopia, Ireland, India, Mali, Cambodia, Dominican Republic, Tanzania, and China. Ten countries with the lowest economic growth were Guinea, Greece, Botswana, Kuwait, Moldova, Trinidad and Tobago, Burundi, Brazil, Venezuela RB and Sierra Leone. Average growth in terms of statistical mean was 2.91% (Bahrain), median 2.9% (Bahrain), and mode 3.0% (Thailand).

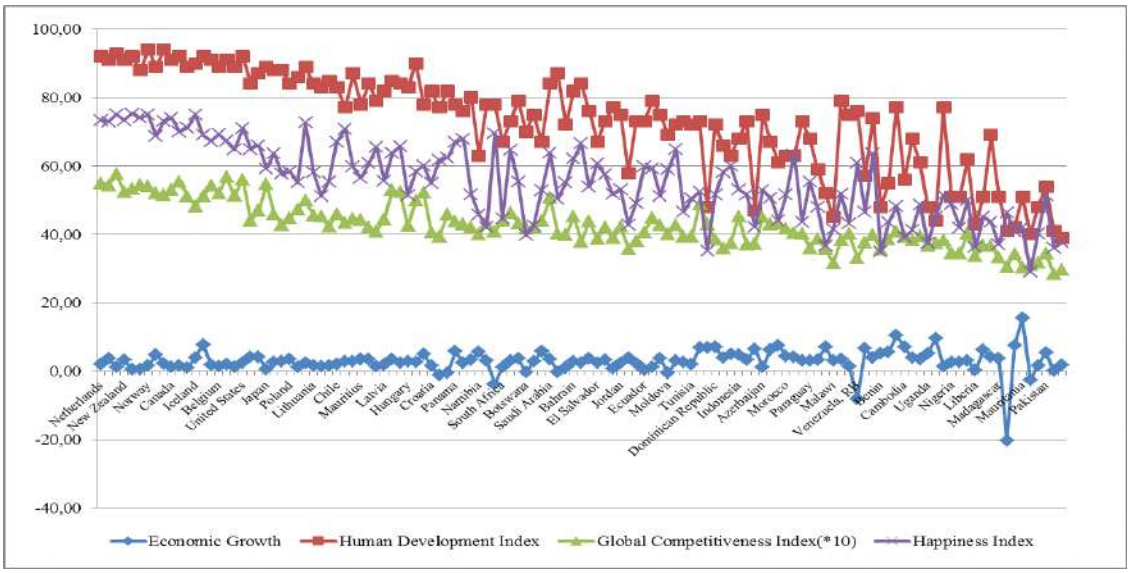

Figure 2: Economic Growth, Human Development, Global Competitiveness and Happiness

The highest human development index was in Australia (94.00) and the lowest human development index was in Chad (39.00). Ten countries with highest index of human development were: Norway, Australia, Switzerland, Netherlands, Denmark, Germany, Ireland, United States, Sweden, and New Zealand. Ten countries with lowest human development index were: Haiti, Senegal, Malawi, Ethiopia, Liberia, Mali, Sierra Leone, Guinea, Burundi, and Chad. Average index of human development in terms of statistical mean was 72.99 (Jamaica, Colombia, Tunisia, Dominican Republic, and Belize), median was 76.00 (Mexico, Georgia, Turkey, Jordan, Macedonia, Azerbaijan, and Ukraine), and mode was 73.00 (The Netherland, Sweden, New Zealand, and Australia). The highest global competitiveness index was 5.76 (Switzerland) and the lowest global competitiveness index was 2.84 (Guinea). Ten countries with highest index of global competitiveness were: Switzerland, Singapore, United States, Germany, Netherlands, Japan, Finland, Sweden, United Kingdom, and Norway. Ten countries with lowest index of global competitiveness were: Liberia, Madagascar, Venezuela RB, Haiti, Malawi, Burundi, Sierra Leone, Mauritania, Chad, and Guinea. The average index of global competitiveness in term of statistical mean was 4.27 (Georgia, Jordan, Hungary, Macedonia, Colombia, Rwanda, Mexico), median was 4.22 (Slovak Republic, Georgia, Cyprus, Peru, Jordan) and mode was 4.39 (Turkey, Panama, Philippines, South Africa, Malta). The lowest index of

happiness was in Burundi (29.05) and the highest index of happiness was in Denmark. Ten countries with highest index of happiness were: Denmark, Switzerland, Iceland, Norway, Finland, Canada, Netherlands, New Zealand, Australia and Sweden. Ten countries with lowest index of happiness were: Cambodia, Chad, Uganda, Madagascar, Tanzania, Liberia, Guinea, Rwanda, Benin, and Burundi. Average index of happiness in terms of statistical mean was 55.4 (Paraguay), median was 55.23 (Cyprus, Latvia, Croatia, Romania, Jamaica, and Paraguay), and mode was 58.35 (Poland, Ethiopia, Lithuania, Korea Republic, Peru, Moldova, and Bolivia).

Figure 3 (left panel): presents Scatter Diagram between economic growth and happiness that shows a negative trend. It means that economic growth had negative correlation on happiness. The higher the economic growth of a country will be the higher the index of happiness of the country. Regression coefficient resulted by regression analysis was positive, -0.55. The regression coefficient was not statistically significant as t-calculated (1.86) was smaller than t-table (1.98) n=123, at 95% significant level, and P-value (0.07) were more than 0.05.

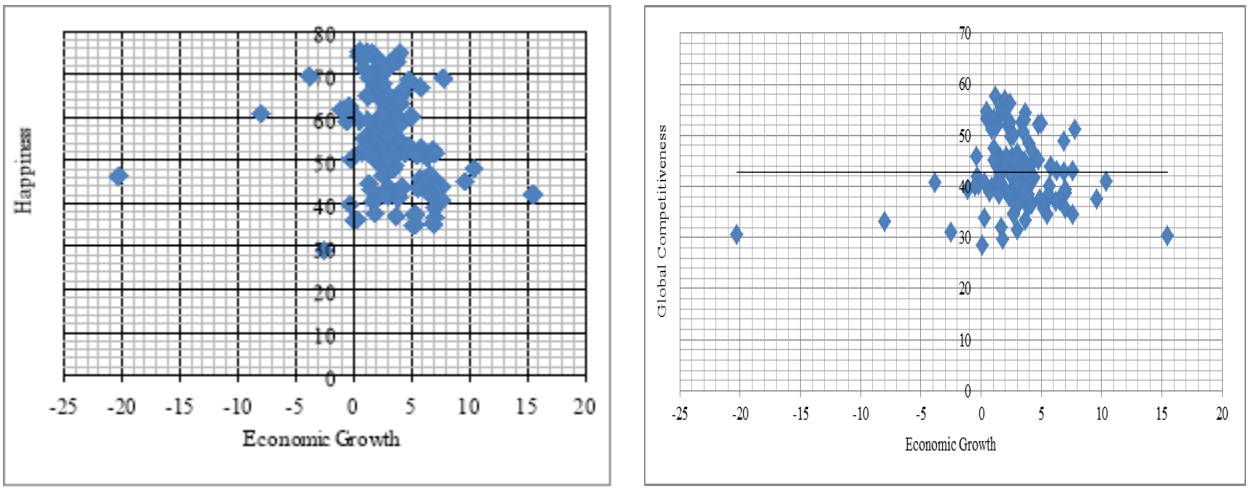

Figure 3: Scatter Diagram between Economic Growth and Happiness (Left Panel) and between Economic Growth and Global Competitiveness (Right Panel)

Figure 3 (right panel): presents Scatter Diagram between economic growth and the global competitiveness that shows a positive trend. It means that human development had positive correlation on global competitiveness. The higher the growth of GDP of a country, the higher the index of global competitiveness was. Regression coefficient resulted by regression analysis was positive, 0.0006. The regression coefficient was not statistically significant as t-calculated (0.004) was far smaller than t-table (1.98) n=123, at 95% significant level, and P-value (0.997) were more than 0.05.

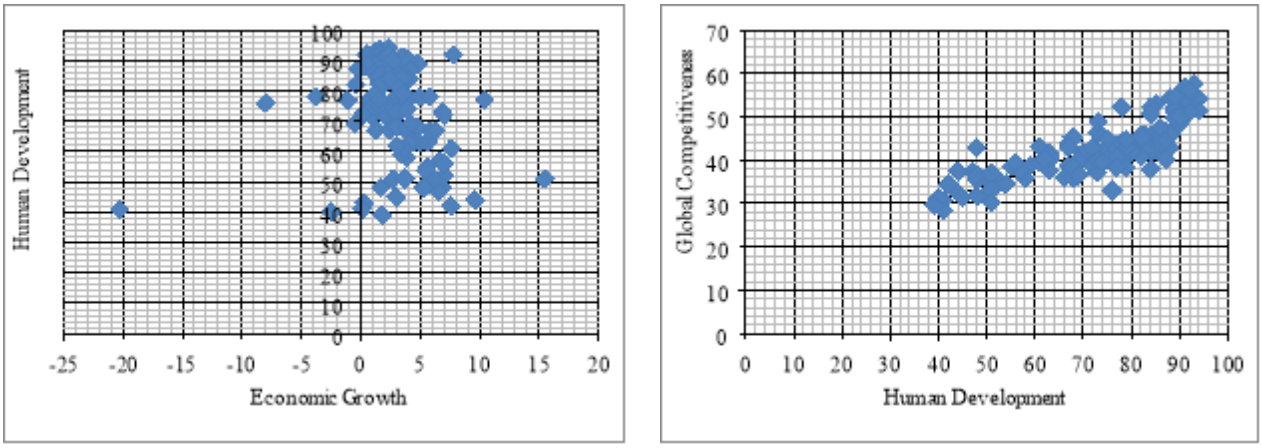

Figure 4: Scatter Diagram between Economic Growth and Human Development (Left Panel) and between Human Development and Global Competitiveness (Right Panel)

Figure 4 (left panel): presents Scatter Diagram between economic growth and human development that shows a positive trend. It means that economic growth had positive correlation on human development. The higher the growth of GDP of a country, the higher the index of human development was. Regression coefficient resulted by regression analysis was positive (-0.54), but it was not statistically significant as t-calculated (1.38) was far smaller than t-table (1.98) n=123, at 95% significant level, and P-value (0.17) were more than 0.05.

Figure 4 (right panel): presents Scatter Diagram between human development and global competitiveness that shows a positive trend. It means that human development had positive correlation on global competitiveness. The higher the human development index of a country, the higher the index of global competitiveness index was. Regression coefficient resulted by regression analysis was positive, 0.37 and was statistically significant as t-calculated (16.11) was far higher than t-table (1.98) n=123, at 95% significant level, and P-value (0.00) were more than 0.05.

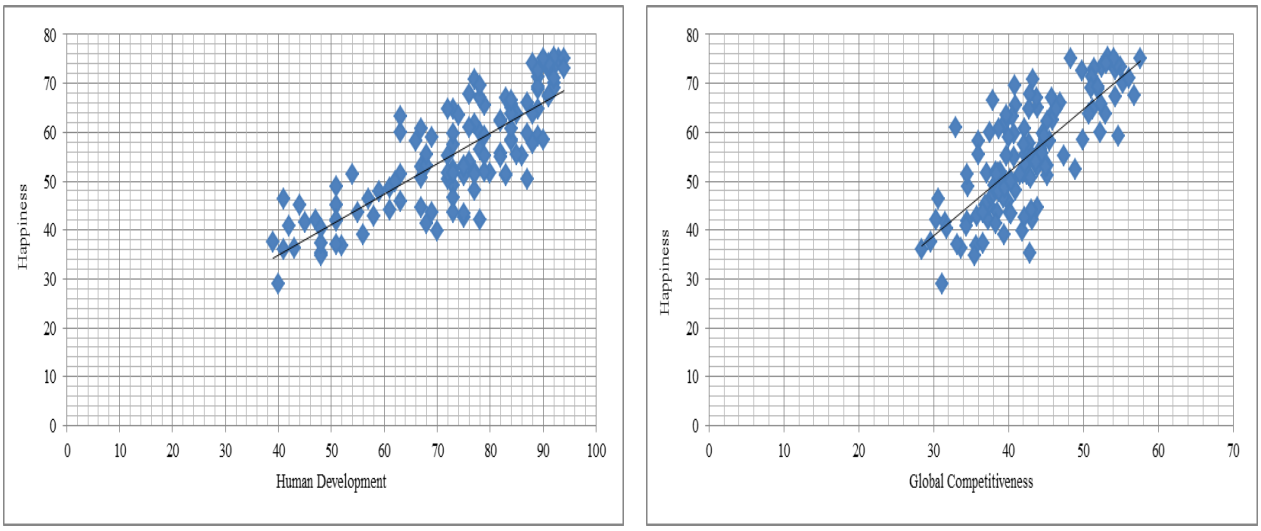

Figure 5: Scatter Diagram between Human Development and Happiness (Left Panel) and between Global Competitiveness and Happiness (Right Panel)

Figure 5 (left panel): presents Scatter Diagram between human development and happiness that shows a positive trend. It means that human development had positive correlation on happiness. The higher the human development index of a country, the higher the index of happiness was. Regression coefficient resulted by regression analysis was positive, 0.37. The regression coefficient was statistically significant as t-calculated (16.11) was far higher than t-table (1.98) n=123, at 95% significant level, and P-value (0.00) were more than 0.05.

Figure 5 (right panel): presents Scatter Diagram between global competitiveness and happiness that shows a positive trend. It means that global competitiveness had positive correlation on happiness. The higher the global competitiveness index of a country, the higher the index of happiness was. Regression coefficient resulted by regression analysis was positive (1.29). The regression coefficient was statistically significant as t-calculated (13.00) was far higher than t-table (1.98) n=123, at 95% significant level, and P-value (0.00) were more than 0.05.

Figure 6: presents the results of regression analysis for correlation analysis among variables being studied. The coefficient correlation between economic growth and the happiness was negative but very weak as r_{14}= -0.1667. The coefficient correlation between economic growth and global competitiveness was positive, but very weak as r_{13} = 0.0003. Again, the coefficient correlation between economic growth and human development was also negative, but very weak as r_{12} = -0.1244. Coefficient correlation between human development and global competitiveness was positive and very strong as r_{23} = 0.8256. Meanwhile the coefficient correlation between human development and happiness was also positive and very strong as r_{24} = 0.8164. Finally, the coefficient correlation between global competitiveness and happiness was positive and strong as r_{34} = 0.7635.

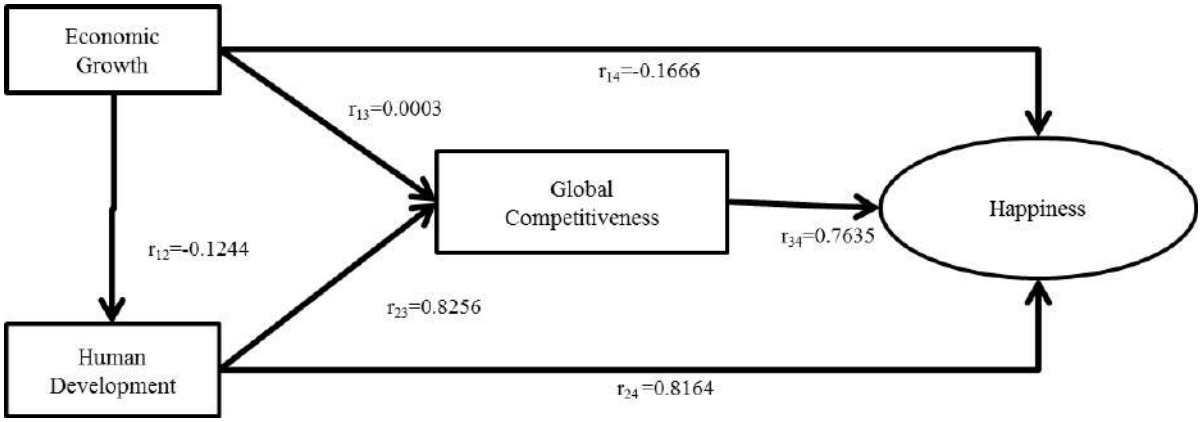

Figure 6: Correlation Coefficients among Economic Growth, Human Development, Global Competitiveness and Happiness

Solving the path equation proposed in Method of Analysis above, path coefficients have been calculated. In Path-1: the direct impact of economic growth on happiness was negative and significant as P_{41}=-0.11> [0.05]. It means that an increase in economic growth by 1 per cent would decrease the index of happiness by 0.11 per cent. In Path-2: the direct impact of economic growth on global competitiveness was positive and significant as P_{31}= 0.94 > 0.05. It means that an increase of economic growth by 1 per cent would increase the index of global competitiveness by 0.94 per cent. In Path-3: the direct impact of economic growth on human development was negative and significant as P_{21}= -0.12 > [0.05]. It means that an increase of economic growth by 1 per cent would decrease the index of human development by 0.12 per cent. In Path-4: the direct impact of human development on global competitiveness was positive and significant as P_{32}= 0.94 > 0.05. It means that an increase of human development index by 1 per cent would increase the index of global competitiveness by 0.94 per cent. In Path-5: the direct impact of human development on happiness was positive and significant as P_{42}=0.43 > 0.05. It means that an increase of human development index by 1 per cent would increase the index of happiness by 0.43 per cent. Finally, in Path-6: the direct impact of global competitiveness on happiness was positive and significant as P_{43} = 0.42 > 0.05. An increase of global competitiveness index by 1 per cent would increase the index of happiness by 0.42 per cent.

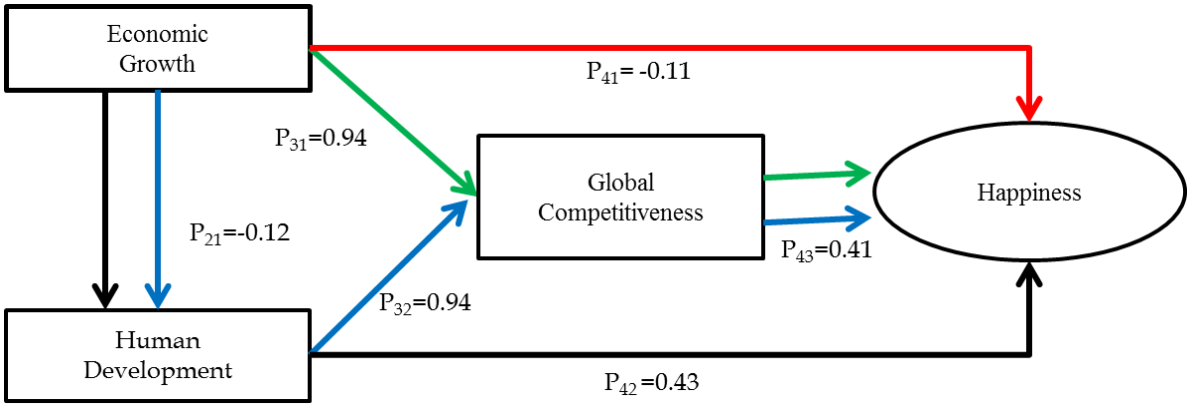

Figure 7: Path and Path Coefficients for Analyzing Direct and Indirect Impact of Economic Growth on Happiness

Figure 7: provides path model for analyzing direct and indirect impact of human development on happiness. In Path-1 (red-path), direct impact of human development on happiness was positive and significant, with P_{31}= 0.61. The higher the increase of the index of human development will increase the index of happiness. One per cent increase in economic growth would increase 0.61 per cent in happiness index. In Path-7 (green-path), indirect impact of economic growth on happiness, through global competitiveness was positive and significant P_{43}x P_{31}=0.41 x 0.94 = 0.38 > 0.05. It means that indirectly through global competitiveness, an increase of 1 per cent of economic growth would increase the index of happiness by 0.38 per cent. In Path-8 (the blue-path), indirect impact of economic growth on happiness through global competitiveness and human development was negative but statistically not

significant as $P_{43}xP_{32}xP_{21}$= 0.41 x 0.94 x -0.12= -0.05 <= 0.05. An increase of economic growth by 1 per cent would, indirectly decrease the index of happiness by 0.05 per cent. Finally, in Path-9 (black-path), the indirect impact of economic on happiness through human development was negative and statistically not significant as $P_{42}xP_{21}$ = 0.43 x -0.12 = -0.05 < = 0.05.

Conclusions

Two conclusions could be drawn, firstly, in Path-1 (red-path); economic growth had negative and significant direct impact on happiness. Secondly, indirectly, the impacts of economic growth on happiness varied depend on the path. On Path-7 (green path), the indirect impact of economic growth on happiness through global competitiveness was positive and statistically significant. On Path-8 (blue-path), the indirect impact of economic growth on happiness through global competitiveness and human development was negative but statistically not significant. Path-9 (black-path), the indirect impact of economic growth on happiness through human development was negative and statistically not significant. The implication of this finding was that economic growth no longer important indicator of economic development. Human development and global competitiveness were two important development indicators that improve and maintenance the level of happiness.

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Examining pre-service elementary school teacher beliefs and instructional practices in mathematics class

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Abstract

The gap between theory and practice has become a critical issue in the effort of improving the learning of mathematics. Beliefs may have been one of the contributing factors to the widening of the gap between theory and practice. Therefore, examining the relationship between beliefs and practices in mathematics is crucial to gain an overview of the preparation of potential teacher candidates and the development of teacher education in the future. This study aims to examine the relationship between beliefs held by pre-service elementary school teachers and the instructional practices in mathematics class. This study employs the case study that focuses on one of the pre-service elementary school teachers who is undertaking practical field experience in the 2015/2016 academic year. The findings of this study indicate that the instructional practices do not necessarily reflect the beliefs that are held. On the other hand, beliefs about the nature of mathematics influence more dominant than the other beliefs against instructional practices.

Keywords: Teacher beliefs, pre-service elementary school teachers, instructional practices, mathematics class

Introduction

Basically, the school mathematics-based research has provided a valuable contribution to what is currently the best process for the acquisition of knowledge and skills (De Corte, 2003). The results of either quantitative or qualitative research or the combination of both leads to suggestions for the points that have to be considered in developing the teaching of mathematics in schools. However, the phenomenon of the gap between theory (including the results and recommendations of research) and practice in schools is the critical issue that needs to be raised to the "surface" (Geiger & Goos, 2006; Malone, 2000; Smith, 2000). The gap is an inconsistency between what is expected from the results of the research and decision making in practice at school.

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The teachers' belief is one of the potential factors contributing to the gap between theory and practice. The plausible reason for this is that belief becomes one of the variables that leads a person in making decisions (Pajares, 1992; Thompson, 1992). In addition, the instructional practices conducted by the teacher come from the decisions about something that is believed to be true, which comes from the knowledge that they have gained. In other words, the focus on building knowledge and beliefs is relevant to the stages of developing teachers' professionalism (e.g., Fennema, Carpenter, & Franke, 1992; Tatto et al., 2008; Vacc & Bright, 1999).

Empirically, on one hand, some researchers have found that teachers beliefs concerning the study of mathematics were consistent with their practices and behaviors in mathematics classes (e.g., Golafshani, 2005; Stipek, Givvin, Salmon, & MacGyvers, 2001; Zakaria & Maat, 2012). On the other hand, some researchers have found that there were inconsistencies between the beliefs and practices in mathematics classes (Barkatsas & Malone, 2005; Raymond, 1997). Barkatsas and Malone, through the case studies against a veteran teacher (i.e., Ann), found that Ann holds beliefs that are not always consistent with the instructional practices. The inconsistency is primarily caused by the class situation, experience, and social norms. The findings as disclosed by Raymond (1997) that in addition to the class situation, experience, and social norms, inconsistencies between the beliefs and instructional practices are influenced by internal factors (e.g., the teacher's personality) and external factors (e.g., the environment).

In Indonesia, the exploration of teachers' beliefs and practices is quite lacking, and it is the expectation of this study is able to give an overview and contribute suggestions to policymakers and subsequent researchers about how to build a strong foundation for developing the teacher education program. Some researchers agree that the golden period to build the professional teacher began when candidates were educated in College (Purnomo, 2015; Siegel & Wissehr, 2011; Volante & Fazio, 2007). Based on these reasons, this study focuses on examining the beliefs and instructional practices of pre-service teachers and the relationship of the related factors between the two variables.

Dealing with the Definition of Beliefs

Belief is an arbitrary construct designed in such a way that it is hard to give a simple definition. There are many variations of the concept of belief that is used in mathematics education research, so some researchers often formulate their own definition of beliefs that may even be contrary to others (Furinghetti & Pehkonen, 2002; Thompson, 1992). Some researchers looked at the beliefs in the cognitive domains (e.g., Thompson, 1992; Törner, 2002), other researchers put it in the effective domain (e.g., McLeod, 1992), and several others looked at the beliefs in both domains (e.g., Goldin, Epstein, Schorr, & Warner, 2011; Leder & Forgasz, 2002). Correspondingly, there are researchers who argued that the beliefs represent parts of the knowledge (e.g., Furinghetti & Pehkonen, 2002), some think that beliefs contribute to the attitude (e.g., McLeod, 1992), and the other state them as mere conceptions (e.g., Thompson, 1992).

Referring to an online dictionary (www.merriam-webster.com), beliefs may be defined as the conviction of the truth of some statement or the fact of some being or phenomenon, especially when based on the examination of evidence. Aligned with these definitions, some researchers consider that the characteristics of these beliefs refer to the degree of the person's conviction (Furinghetti & Pehkonen, 2002; Thompson, 1992). In other words, beliefs associated with the person's psychological strength may alter the degree of conviction. However, this raises further questions about what the conviction itself is. On one hand, Schoenfeld (1992) argues that beliefs can be defined as understanding and feeling of the individual which shapes the way that the individual conceptualizes and

affects their behavior. Furinghetti and Pehkonnen (2002) argue that the definition proposed by Schoenfeld is more akin to "how beliefs function".

Thompson (1992) defines beliefs as part of one's conception, namely a person's mental structure which includes knowledge, belief, understanding, preferences, and views. Thompson uses the terms beliefs and conceptions interchangeably because the differences were probably not very important to him. On the other hand, Ponte and his colleagues (Ponte, 1994; Ponte & Chapman, 2006) argued that the belief in stating that something is right or wrong, is not based around empirical evidence, and thus holds a proportional nature and does not require internal consistency. Meanwhile, a conception is a cognitive construction that can be seen as the organizing framework of the underlying concept.

Pajares (1992) distinguishes the term belief (conception) and knowledge, in which belief is based on evaluation and decision while knowledge is based on objective fact. Likewise, Griffin and Ohlsson (2001) stated that knowledge and belief refer to qualitatively different aspects of mental representation, in which knowledge refers to the representation of the proposition, and belief refer to the representation of the truth regarding the value of said proposition. Griffin and Ohlsson define knowledge as understanding or awareness of the ideas or propositions ("I understand the claim that humans evolved from monkeys"). After the proposition is known, one can accept it as true ("I believe the claim that ..."), reject it as false ("I do not believe the claim that ..."), or by reserving judgement ("I do not have an opinion about the claim that ... ").

Furinghetti and Pehkonen (2002) analyzed the relationship between belief and knowledge by dividing knowledge into two aspects: objective knowledge (i.e., knowledge accepted by the community) and subjective knowledge (i.e., knowledge created by an individual and does not have to be evaluated by others , see also Ernest, 1991, 1998). Furinghetti and Pehkonnen concluded from their analysis that beliefs refer to the individual's subjective knowledge, and when expressed as a sentence, may (or may not) be logically correct. Thus, the beliefs may not be 100% logically correct, while knowledge holds a 100% probability of being correct. Similarly, Leatham (2006) made an analogy of the relationship between beliefs and knowledge to describe that of everything we believe, there are some things that we ''just believe '' and other things that we ''more than believe '' because we ''know'' them. The things that we ''more than believe'' are reffered to as knowledge and the things that we ''just believe '' are called beliefs. Thus, beliefs and knowledge can be seen as complementary subsets of the set of things that we believe.

Abstract constructs on the definition of beliefs allow someone to give a conclusion based upon the individual perception. These constructs may occur because in order to lead the goal of research and being capable of describing each variable to focus on, the researcher should be able to give a decision and clarify the definition of the legal basis for the research focus. Therefore, this study assumes that beliefs can be in the cognitive domain if we emphasize the relationship between beliefs and knowledge. On the other hand, if the beliefs are seen from the reaction to a particular situation means we consider the beliefs associated with the affective part of individual (Furinghetti & Pehkonen, 2002). The definition of beliefs refers to the subjective knowledge of the individual (Furinghetti & Pehkonen, 2002; Op't Eynde, De Corte, & Verschaffel, 2002) based on the experiences (Raymond, 1997; Thompson, 1992) and expressed in [attitude] proposisional (Goldin, 2002; Griffin & Ohlsson, 2001; Pajares, 1992), views, and perception (Thompson, 1992) to a value of truth (Goldin, 2002; Griffin & Ohlsson, 2001). Thus, the term conception, [subjective] knowledge, belief, perception in this research is used interchangeably.

Method

Participant

This study uses case studies to explore the beliefs and instructional practices of one of the pre-service elementary school teachers, who shall be referred to as Sarijem (pseudonym) and the relationship and potential factors associated in between these two variables. Sarijem is a 7th-semester student, 21-years-old and ethnically Javanese. She is from a hometown of entrants who followed her parents working in Jakarta. Sarijem was born in East Java and has graduated from elementary school and junior high school in her native region and graduated high school in Pati, Central Java. In addition, all the schools were public schools. This study was conducted at the time when participants joined the program field experience in the academic year of 2015/2016 at one elementary school in East Jakarta. Sarijem has not had any previous teaching experience, so this study is intended to contribute to the development of teacher training courses, especially in elementary schools.

Data collection

Data were collected through a questionnaire, videotaped classroom observations and an interview. The questionnaire with open-ended questions focused on obtaining data on the beliefs about the nature of mathematics, and the beliefs about mathematics teaching and learning. Beliefs about the nature of mathematics are a viewpoint, perception or conception of someone's overall perception of mathematics as a discipline (Beswick, 2012; Ernest, 1989; Perkkilä, 2003; Thompson, 1992). Whereas, beliefs about teaching and learning is subjective knowledge or the implicit viewpoint of teachers on various types of teaching, the meaning of teaching and learning, the role of teachers and students in learning, how students learn mathematics, and class activities related to teaching mathematics (Chan, 2004; Ernest, 1989; Thompson, 1992). Videotaped classroom observations are used to obtain the behavioural and instructional practices in the classroom. In addition, beliefs, practices and related factors are explored with the semi-structured interview.

The questionnaire was given to Sarijem before she performed a series of classroom teachings. The questionnaire contains open-ended questions in the following order (adapted from Adam, 2012) .

1. How do you explain what mathematics is to someone who has never heard of mathematics before?

2. What do you think mathematicians do when they work with mathematics?

3. In your opinion, what is the best way for children to learn mathematics?

4. What methods do you have that can have an effect on the way students learn mathematics?

5. In maths class, what do you think about the role of (a) teachers and (b) students?

6. In your opinion, what is the most effective way of teaching mathematics?

The six 35-minute teaching sessions were videotaped in order to obtain data on instructional practices in the classroom. Sarijem taught the fourth grade with materials related to the greatest common factors and least common multiples.

After the series of teaching activities were completed, interviews were conducted to elaborate Sarijem's beliefs that she had stated in her answers to the questionnaire. The interview was carried out using similar questions to those asked on the questionnaire and was recorded using the audio-recording application on a hand phone. Furthermore, the

interview was also conducted to elaborate the instructional practices conducted by Sarijem and the factors associated with beliefs and practices. Some questions in addition to those contained in the questionnaire are shown as follows.

1. How do you teach mathematics?
2. Why did you introduce the mathematical ideas in this manner?
3. How did you help students understand the new ideas?
4. What encouraged you to teach in this manner?
5. What limits you in being able to teach mathematics in the way you want/plan?

Data analysis

The questionnaire responses were analyzed with an interesting pattern and elaborated through the interview. Related audio recordings and the transcribed interview was analyzed to describe the beliefs held by Sarijem. The pattern of responses related to the questionnaire and the interview are categorized into traditional beliefs (absolutist), primarily traditional, primarily constructivist, and constructivist (fallibilist) for the dimensions on the nature of mathematics and the teaching and learning of mathematics.

The recorded video was played and viewed together with the participant along with the interview to explore the teaching practices and limitations that the participant faced throughout the teaching sessions. This was done to confirm the answers to the questions stated in the questionnaire and the interview beforehand. The video footage and interview has been transcribed, then read and verified again by the participant to ensure the accuracy and thoroughness.

Results and Discussion

This section discusses Sarijem's beliefs by splitting them into two separate parts, i.e. beliefs about the nature of mathematics and beliefs about teaching and learning mathematics. The analysis of the interconnectedness of beliefs and practices as well as potential factors that influence them was addressed afterwards.

Sarijem's beliefs about the nature of mathematics

Based on the pattern of responses to the "open-ended questions" on the questionnaire and the interview session, beliefs about the nature of mathematics held by Sarijem leads to the combination of traditional and constructivist view, with primarily traditional mathematics. Sarijem states that mathematics is an exact science that is used by humans as a means of counting everyday problems. When asked more about mathematics, Sarijem stated that mathematics is a science that is applicable and relevant to a person's experiences and everyday problems. Ernest (1991) states that the constructivist view of looking at mathematics as part of a blend with the human culture, so that it cannot be separated with the knowledge of physical and other sciences. In other words, mathematics comes from and for social purposes.

> The researcher: How do you explain what mathematics is like to someone who has never heard of mathematics before?
>
> Sarijem: ... Mathematics is a science that is used by humans to help calculate
>
> ...include the symbols and rules to do the calculations....
>
> The researcher: Besides that, what else do you think about maths?
>
> Sarijem: Mathematics is also used in other studies and is relevant to the problems of everyday life.

The researcher: Earlier, you said that mathematics includes a collection of symbols and rules. According to you, who makes the rules? Is it the mathematicians or does everyone have a chance to make or add to them?

Sarijem: Mathematicians, sir, because mathematicians have a thought process that is coherent and logical ... if we're not coherent and logical thinking.

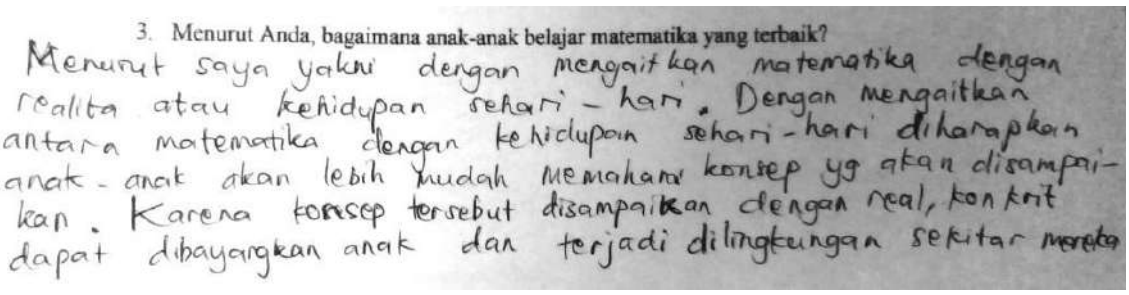
The researcher: Ok. Do you think that the mathematical rules that already exist could be wrong?

Sarijem: I think not, sir, because the rules have been established through a series of experiments and published afterwards.

Sarijem stated that the rules of mathematics are accepted to be true. The mathematical rules and facts can't be doubted and hold an undeniable truth. Furthermore, Sarijem also stated that the role of mathematicians is crucial in the development of mathematics. The mathematical objects are discovered by mathematicians through a series of experiments and published after perfection. Sarijem's views about maths are in line with the views held by an absolutist. Absolutists see mathematics as absolute truth, accepted by everyone, and does not rely on the human knowledge and context (Ernest, 1991; Hersh, 1997). The views absolutists can be associated with the platonic, formalist, and logicist views stating that mathematics is as absolute as a divine gift, a formal language without error or contradiction, does not depend on human knowledge, waiting to be discovered and has existed before the birth of mankind, a set of rules and procedures that are rigid and picture mathematics as essential calculations (Ernest, 1991; Hersh, 1997; Sriraman, 2004; White-Fredette, 2010). In other words, mathematical objects are taken for granted to be applied by the user.

Sarijem's beliefs about teaching and learning mathematics

Typically, Sarijem adopts beliefs about mathematics teaching and learning that is primarily constructivist-oriented. Sarijem stated that the best way to learn mathematics is by connecting mathematics with daily life. The following is Sarijem's statement about the best way to learn mathematics.


3. Menurut Anda, bagaimana anak-anak belajar matematika yang terbaik?

Menurut saya yakni dengan mengaitkan matematika dengan realita atau kehidupan sehari-hari. Dengan mengaitkan antara matematika dengan kehidupan sehari-hari diharapkan anak-anak akan lebih mudah memahami konsep yg akan disampaikan. Karena konsep tersebut disampaikan dengan real, konkrit dapat dibayangkan anak dan terjadi dilingkungan sekitar mereka

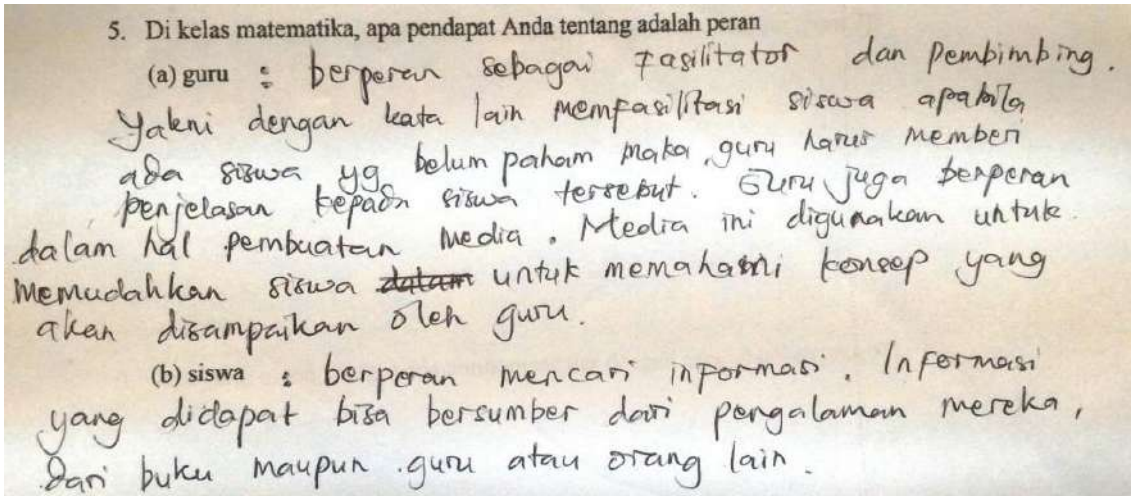
Figure 1. *Sarijem's statement about the best way to learn mathematics*

Translate: 3. In your opinion, how can children best learn mathematics?

Sarijem's Answer: In my opinion, it is best to associate mathematics with reality or everyday life. By linking mathematics to daily life children will easily be able to understand the concepts that are being delivered. Because the concept is presented with something that can be imagined by children and occurs in the environment around them.

In the interview and discussion sessions, Sarijem stated that "...by associating mathematics with daily life experiences, students can easily find and grasp the concept if they can imagine it." Moreover, Sarijem also stated that "... it is difficult for the students, especially in elementary school, if mathematics is not associated with anything they can imagine." Sarijem's beliefs about the best way of teaching and learning mathematics are consistent with her beliefs that mathematics cannot be separated from the human context and everyday life.

In the questionnaire, Sarijem stated that the teacher's role in learning is as a facilitator in guiding students to discover new knowledge. Meanwhile, the student's role is as a person seeking information or knowledge. Sarijem's statement was in line with the constructivist view which proposes that the conception and understanding of learners come from the construction of meaning where learners are involved in the process of building the individual interpretation of their experiences (Applefield, Huber, & Moallem, 2000; Kundi & Nawaz, 2010; Ari, Tunçer, & Demir, 2016). The following is Sarijem's statement about the role of teachers and students in mathematics class.


5. Di kelas matematika, apa pendapat Anda tentang adalah peran

(a) guru : berperan sebagai fasilitator dan pembimbing. Yakni dengan kata lain memfasilitasi siswa apabila ada siswa yg belum paham maka guru harus memberi penjelasan kepada siswa tersebut. Guru juga berperan dalam hal pembuatan media. Media ini digunakan untuk memudahkan siswa ~~dalam~~ untuk memahami konsep yang akan disampaikan oleh guru.

(b) siswa : berperan mencari informasi. Informasi yang didapat bisa bersumber dari pengalaman mereka, dari buku maupun guru atau orang lain.

Figure 2. *Sarijem's statement about the role of teachers and students*

During the discussion sessions and interviews, the researchers identified what is believed by Sarijem about the role of teachers and students is very close with her knowledge of the theory and learning perspective. However, Sarijem's incomplete understanding about the meaning of "teacher as a facilitator" and "students as active constructors" causes what is known as a fallacy of beliefs. When asked about how to facilitate student learning, Sarijem expressed a way to help students who are having difficulty and assisted them in finding solutions to problems, while actively connecting with the activity of thinking.

> The researcher: At the time of facilitating the students, they were expected to participate actively in the learning process. What are the conditions or situations in which the students can be described as active?
>
> Sarijem: When teachers ask open-ended questions or probing questions so that students can think of the problems encountered.
>
> The researcher: So, do you think active in this respect is when students think about the problems through the questions that you asked?
>
> Sarijem: Yes sir, (with accompanying assertion) ... when students are thinking, that means they're being active, sir.

I found that during the interview session, Sarijem's beliefs about teaching have been including her beliefs about learning explicitly. Sarijem adopts beliefs about learning in the perspective of a teacher, so when thinking about the best way to learn mathematics, it is always expressed with how to make students learn the best (a related approach to teaching the teacher to make students learn the best). Thus, the beliefs held by Sarijem about learning mathematics can be said to be a subset of beliefs about teaching mathematics. The plausible reasons for this is because the beliefs about teaching mathematics are subjective or the implicit viewpoint of teachers on various types of teaching, the meaning of teaching and learning, the role of teachers and students in learning, how students learn mathematics and class activities related to teaching mathematics (Chan, 2004; Ernest, 1989; Thompson, 1992). In other words, beliefs about teaching mathematics include beliefs about learning mathematics.

Reflecting on Instructional Practices from Sarijem's Beliefs and some factors that limit it

Under certain circumstances, the instructional practices conducted by Sarijem reflect on what she believes. Sarijem believes that mathematics is a science that is very relevant to the context, the experience and the daily life of human beings, in line with the beliefs about teaching and learning expressed in a way of how to relate mathematics to the context, experience and the student's daily life. This reflects the beliefs held by Sarijem by always trying to initiate the material that she attributed to the context and experience of students. Sarijem also tried to mediate between mathematics and the "context" with the use of props and media.

Sarijem believes that her instructional practices are constructivist orientated because she considers that it integrates the "context" of students into mathematics learning in the classroom. She also felt that the media and props are indicators that she has applied constructivist-orientated practices. These practices are the reflection her beliefs that mathematics is relevant to the context of the students. However, referring to the opinion of Lakatos (in Ernest, 1991, 1998) and Hersh (1997), mathematics is a human activity, in which mathematical objects are in the nature of human knowledge and are a product of human findings. "Students are active" based on this view can be defined as the process of reinvention. Students build their own knowledge of mathematics as facilitated by their teachers. This is in contrast to what happens in Sarijem's class, the use of media and props are more dominated by teachers as a model. Most students act as spectators of what is practiced by the teacher. This is inconsistent with what has been stated that the teacher acts as a facilitator while students are active constructors of knowledge. The instructional practices are more likely to reflect the beliefs held by Sarijem that mathematical objects can only be discovered by mathematicians, the only people capable of specifically discovering and formalizing forms of mathematics. Mathematics are accepted as true, so that students are asked to be "users", which record what is seen and heard and then just apply it. I identified that Sarijem's knowledge of the philosophy of mathematics and learning theories less profoundly form the fallacy beliefs whose practices refer to what she believed was true.

When explaining the solutions to solving problems related the greatest common factor (GCF) and least common multiple (LCM), Sarijem uses factor trees for prime factorization. Sarijem explained that the rules of using the factor trees start by dividing the number interested with the smallest prime number. In the interview, Sarijem explains that such a rule is easily memorized, making it likely students will also find it easy to learn. Sarijem states that the rule is fixed, so in order to solve mathematical problems, users must be use rules that already exist. The following is an excerpt of the interview when discussing the process of explaining the solution GCF (24, 32)

The researcher: Why did you divide by two, why not four or eight?

Sarijem: Actually, it's not always two, sir. According to my memory, in order to find the GCF and LCM by prime factorization, we should start from the smallest prime number first, sir. So, when it cannot be divided by 2, then it can be continued by dividing by 3 and so on, instead of four or eight, because they are not prime numbers. Textbooks, too, start from the smallest prime number anyway, sir.

The researcher: So, should we not be numbers other than prime numbers? Why is that?

Sarijem: No sir, because that is the rule, sir. During my own school experience, rules were like that.

The researcher: Ok. Now, I would like to ask why we are looking for the GCF and LCM by finding prime factors? Why not factor of other numbers?

Sarijem: I do not know sir, that's the rule of the finding the GCF and LCM, sir (laughing).

Sarijem's practices, which emphasized the rigid rules and procedures when explaining the prime factorization, are consistent with her beliefs that mathematics is an accumulation of facts, rules and procedures and then using said knowledge to solve the problem that is accepted as true. What she believes contradicts the constructivist view, which states that mathematics is not discovered, but constructed by humans so that the rules and procedures of mathematics can be created by anyone. Thus, mathematical problems can be solved by various methods or approaches that can be undertaken by students. Students can be guided to find a canonical sequence of 24 and 32 in their own way. Some examples of how using mental strategies can be illustrated as follows (Purnomo, 2014).

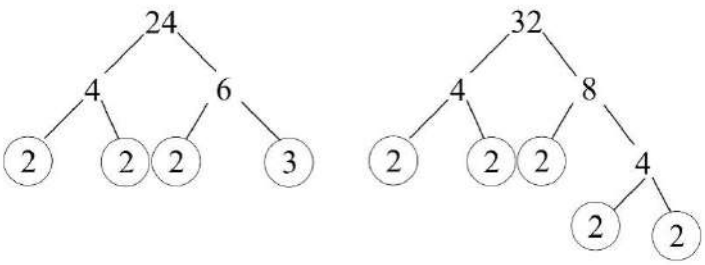


Figure 3. *The Mental Strategies factorization*

I identified that in addition to the previous school experiences, the lack of mathematical knowledge for teaching also became contributing factors which lead to practices that affect Sarijem's approach towards instrumental teaching. Sarijem did not yet realize that looking for LCM and GCF can be done using prime factorization epistemologically. I use the term "epistemological content knowledge" as one of the forms "mathematical knowledge for teaching" in this case. Epistemological content knowledge requires teachers to reflect epistemologically on mathematical structure as the foundation in establishing and communicating mathematical arguments. For example, the teacher must interpret and able to connect between the prime factorization and the fundamental theorem of arithmetic.

I also identified that the practice is carried out by Sarijem were more performance-orientated, which is focused on the students' ability to work on the problems quickly and correctly. The practice also still focused on the textbook as the main reference to teaching and did not dare to abandon the habit of using the rules contained in the book. Sarijem

admitted that while in school, she was also taught to do so by her teacher, so it feels odd to not follow the rules out of habit. This instrumental teaching resulted in students learning leads to a superficial learning dominated by memorizing facts and rules. Consequently, students often experience errors, do not interpret what was done, and lack the sensitivity and ability of a problem solver (Purnomo, Kowiyah, Alyani, & Assiti, 2014; Yang & Wu, 2010).

Focusing on the interaction between students and teachers, the interaction was dominated by one-on-one dialogue between Sarijem and her students. The dialogue was conducted by Sarijem using probing questions. High frequencies shown that Sarijem would come near to students to seek information through a series of questions that are guiding towards the discussion. Sarijem believed that was one way of making the students actively engage in the learning process. Sarijem uses questions as a way to assess the experience and knowledge of her students. In other words, the richer the feedback obtained from the students, teachers will increasingly understand the weakness and can continue to improve it. This strategy as suggested by some researchers uses effective questions, and is one of the strategies for integrating assessment into learning (Black, Harrison, Lee, Marshall, & Wiliam, 2003, 2004; Lee, 2006; Purnomo, 2015; Sumantri & Satriani, 2016). However, the peers involvement to provide feedback get less opportunity. The opportunity was not also provided in most of Sarijem's practices in the classroom, that the interaction between students and peers received less emphasis. This fact is not consistent with what she declared that students who engage in collaborative learning always benefit in their learning.

In interviews and discussion sessions, Sarijem stated that the opportunity to do collaborative learning is difficult because of time pressure and the material must be prepared by the mid-term deadline. Furthermore, Sarijem also realized that the practice that was planned was constrained by the learning environment, especially the behavior of students in the classroom. Sarijem realized that she could not organize the class because of the number of students, which exceeded the quota. For these reasons also, Sarijem had to limit the process of discussion between the teacher and the student.

Conclusions

This research examines the beliefs and practices of pre-service elementary school teacher early in her experience teaching mathematics. The findings of this study indicate that (1) beliefs about the nature of mathematics held by Sarijem are more traditional than her beliefs about teaching and learning mathematics, (2) the practices that are done by Sarijem are primarily more traditional than constructivist, and (3) the instructional practices do not always reflect on the beliefs that Sarijem holds. The complex relationship of related beliefs and practices were also encountered by some previous researchers (e.g., Barkatsas & Malone, 2005; Raymond, 1997; Shield, 1999). Some identified factors restricting the practice of Sarijem in mathematics class so that it is not always consistent with her beliefs, including the previous school experience, social norms, mathematical knowledge for teaching, the attitude that dares not to act out of habit, time constraints, high-stakes testing, curriculum, student behavior and the learning environment. Further, inconsistencies between beliefs held by Sarijem were influenced by the weak knowledge of the philosophy of mathematics and the learning theory.

The findings of this study indicate the important role of the philosophy of mathematics, as proven instructional practices done by Sarijem more reflected her beliefs about the nature of mathematics. This can also be found in previous studies (e.g., Perkkilä, 2003), which reveals that beliefs about the nature of mathematics contribute more strongly than other beliefs. Chassapis (2007) proposed some arguments about the philosophy of mathematics

that hold a key position in the professional knowledge of mathematics teachers. The first argument confirmed the direct relationship between the philosophy of mathematics and the basic features of mathematics education. The second argument is that the ideas, views, conceptions, or beliefs about mathematics teachers, teaching, and learning, reflected or related to the philosophy of mathematics implicitly. The third argument stated the undoubted assumption that the philosophy of mathematics is directly related to understanding the contents in mathematics as knowledge to be taught. It can be used as input to the curriculum of the Elementary School Teacher Education program to integrate the philosophy of mathematics into the philosophies that are commonly used in the current curriculum.

Continuous reform towards higher education curriculum in Indonesia generally and Education Studies Program for elementary school teachers in particular have become a necessity. It is important that in addition to the knowledge of content, mathematical content knowledge for teaching also needs to be stressed. It is none other than the Education Studies Program that is designed for the curriculum of elementary school teachers, who place more emphasis on aspects of mathematical content knowledge and is more oriented to high-level cognitive abilities, but the integration of mathematical knowledge for teaching is weak.

The importance of practical experience for pre-service teachers also needs to be addressed by policy makers at the higher education level, by integrating field experience on an ongoing basis and not just at the end of their coursework. It is useful to provide an opportunity for pre-service teachers related to the self-reflection of instructional practices in the classroom as the way to develop knowledge and beliefs or maybe refine them in the future. This can be done in several ways, such as (1) involving pre-service teachers in self-study to either himself or the teacher's example as the subject, (2) making the program provide an opportunity for pre-service teacher ' observations in schools, and (3) involving pre-service teachers in research activities on an ongoing basis.

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Facilitating students' creativity in an EFL writing classroom: Voices from the field

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Abstract

This article documents an English as a foreign language (EFL) classroom writing activity to promote students' creativity. This classroom writing activity had two main objectives: to provide students with writing exercises that would promote practical use of written English language as a means of communication, and to facilitate students' creativity in engaging with and solving problems in their social community. A real-world pedagogic writing task was developed to achieve these two objectives. The activity was carried out in a junior secondary school extra-curricular program with 16 students from Years 7 and 8. Students' perceptions of the writing activity were positive, and more importantly, their awareness of social issues in the community improved as students became engaged in meaningful communicative situations in their real social environment.

Keywords: creativity; classroom procedure; writing activity; learning English as a foreign language (EFL).

Resumen

En este artículo se documenta una actividad de clase de escritura de inglés como lengua extranjera (EFL) para promover la creatividad de los estudiantes. Dicha actividad tuvo dos objetivos principales: proporcionar a los estudiantes ejercicios de escritura que promuevan el uso práctico del idioma inglés escrito como un medio de comunicación, y facilitar la creatividad de los estudiantes en la participación y la resolución de problemas en su entorno social. Los objetivos se lograron mediante una actividad situada en el contexo real. La misma se llevó a cabo como actividad extracurricular en una escuela secundaria con 16 estudiantes de 7mo y 8vo año. Las percepciones de la actividad de escritura de los estudiantes fueron positivas, y lo más importante, su conciencia respecto a los problemas sociales de la comunidad ha mejorado, ya que los estudiantes se involucraron en situaciones comunicativas reales en su entorno social.

Palabras clave: creatividad; procedimiento de aula; actividad de escritura; el aprendizaje del inglés como lengua extranjera (EFL).

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TEACHING ENGLISH AS a foreign language (EFL) in junior secondary schools should aim not only to provide students with knowledge of and skills in the target language, but also to mediate meaningful target language use. The development of language learning tasks and materials should therefore address the context in which they are used (see Tomlinson, 2008a, 2008b, 2012). In this regard, students need to be given opportunities to participate in the real use of language and study "how language is used for communication" (Tomlinson, 2012, p. 159).

Creativity is viewed as a way of promoting meaningful language learning. According to Stepanek (2015, pp. 98-99), the inclusion of creativity in language learning activities helps teachers to provide students with varied expressions of the target language in accordance with certain communicative goals, to modify language learning lessons, and to engage students in close-to-reality situations. Furthermore, Maley (2015) suggests that the practice of creativity in language classrooms helps students learn the target language and respond to changes in their social lives. According to this author, creativity is an integral part of problem solving and critical thinking. Therefore, the inclusion of creativity in classroom teaching and learning practices may help to address social issues beyond the classroom environment.

Recent literature on creativity in EFL learning classroom practices has predominantly discussed the use of literature in the classroom (see, for example, Hewings, Prescott, & Seargeant, 2016; Maley & Peachey, 2015; Van, 2009). The range of classroom activities has included the use of drama (e.g. Boudreault, 2010; Galante & Thomson, 2016), creative writing such as poetry (e.g. Hanauer, 2012), short stories and fiction (e.g. Liaw, 2001) and storytelling (e.g. Heathfield, 2015; Ohler, 2013). However, classroom writing activities that promote creativity in language learning have not widely discussed in literature, specifically the use of creativity to address social issues beyond the classroom environment. It is thus the aim of this article to describe a classroom writing activity that included creativity to help students engage with social issues in their community by writing personal messages. This article explains the classroom procedure for the writing activity, and describes the school context and the students. The various stages of the activity are then presented, including the lesson plan and writing task, a survey of students' current skills, classroom activities and the distribution of postcards, before drawing some conclusions.

A Classroom Procedure for Promoting Creativity in EFL Writing Classrooms

The writing activity discussed in this article had two main objectives: (1) to provide students with a writing activity that would promote the real-world use of written English language as a means of communication; and (2) to facilitate the students' creativity in engaging with their social community and address particular issues in their society. For

these purposes, we adopted a process genre approach to writing, as proposed by Badger and White (2000). This approach combines a process approach and a genre approach to writing, in which a writing activity is attached to a social function, being undertaken in order to achieve certain communicative goals within a particular social situation. The development of a text should therefore consider "the subject matter, the writer/audience relationship and organisation, channel, or mode" (Badger & White, 2000, p. 158) and should also go through a rigorous writing process, including pre-writing, drafting, composing, editing, and revising (Hyland, 2003; Susser, 1994; Urquhart & McIver, 2015).

The School Context and the Students

The writing activity was carried out as part of an extracurricular activity in an "English club" at a junior secondary school in Indonesia. The activity comprised three weekly sessions of 80 minutes each with sixteen students from Years 7 and 8 aged between 13 and 14 years old. It is important to note that these students had been learning basic level of English for three years prior to our writing activity. Students' participation in the writing extracurricular activity was voluntary, and consent from their parents had been obtained prior to the activity.

Writing Task

The objective of the writing activity in our classroom was to enable students to write messages on postcards using correct sentence structures. Specifically, the students were asked to write messages to their parents, relatives and people in their surroundings about the risks of smoking both to smokers themselves and to non-smokers in the vicinity of cigarettes. A lesson plan was designed to address these two main objectives and to guide the classroom implementation. A real-world pedagogic writing task was developed in accordance with the process genre approach applied in our classroom context. It was real-world in that it addressed students' communicative situations in their real social environment, and pedagogic because it was purposely designed to facilitate their knowledge of genre and their writing abilities (Hyland, 2003).

In the classroom, the students were asked to write messages about the potential risks of smoking on postcards to their parents, relatives or other people they cared about in their social community. The students in our classroom were already familiar with writing messages, particularly using social media. However, we opted to create traditional postcards, for which students used thick paper, pens, coloured pencils and other materials to create their designs. This was because we planned to let the students send the cards out to people in their social community rather than within the school.

In our writing classroom, the development of postcards extended the students'

creativity. Students were given opportunities to explore their ideas about several aspects, such as the content, shape, colours and fonts relating to the design of the postcards. These opportunities aimed to promote students' self-esteem and help them learn about making decisions, both of which are pillars of creativity (Read, 2015).

Survey

One week before the writing activity, we collected information about the students' strengths and weaknesses in writing. We asked them to write a short paragraph telling us about their daily routines. The results of the survey revealed that several aspects of students' writing required improvement, namely grammar, sentence structure and vocabulary. Therefore, the first writing session aimed to address these three issues.

Classroom Activities

Pre-writing Activities

Pre-writing activities were carried out to prepare the students for the main writing activity. These provided the students with opportunities to find ideas, gather relevant information, structure the ideas and information, identify the audience and purpose of the writing, and study relevant aspects of the genre (Urquhart & McIver, 2015), which in this case was a personal message. Three pre-writing activities were undertaken: learning scaffolding, brainstorming, and reading. The learning scaffolding activity aimed primarily to address students' weaknesses in the aspects of writing identified from our survey. The choice of learning scaffolding during the pre-writing stage was based on Hosseinpour and Koosha's (2016) findings, who examined whether teacher-led, whole-class scaffolding as a pre-task has an effect on the writing proficiency of EFL learners. Using an experimental design, 50 Iranian EFL female learners participated in their study, which revealed that such activities at the pre-writing stage help students improve the quality of their writing, specifically in aspects such as content, organisation and vocabulary, rather than grammar.

In our classroom context, at the pre-writing stage, the students were taught about several aspects of grammar, including gerunds and infinitives, parts of speech, the present tense, and aspects of formality and expression in language use. These linguistic resources would help students with the writing, and would also reduce their anxiety, thus promoting learning motivation.

Brainstorming was also included in our pre-writing activities. A body of literature on second- and foreign-language writing has suggested that brainstorming activities help learners identify topics for writing (Badger & White, 2000; Guleff, 2002; Hyland, 2003; Neumann & McDonough, 2015). This is because, according to Hyland (2003, p 9), writing is widely perceived as "an act of discovering meaning… and response

is a central means to initiate and guide ideas". In our classroom, the students were asked to discuss the issue of smoking in their social community, and its risks for both smokers and non-smokers. The discussion was conducted mainly in English and was surprisingly demanding, especially for the Year 8 students. We received many good and enthusiastic responses from the students, revealing a variety of social issues. In particular, they highlighted that many parents and relatives were active smokers and smoked near their children. The students commented that it seemed that their parents were unaware of the dangers of smoking to themselves and their children. This issue was then addressed in the students' writing.

The final activity in the pre-writing stage was a reading activity. The effect of reading as a pre-writing task on students' writing achievements is evident in the literature. Kintsch (1998, in Delaney, 2008) suggests that reading prior to a writing activity helps writers to "elaborate models of the text structure and situation, enabling them to select information from the source text, evaluate it, and use it for writing purposes" (p. 141). In our context, we asked the students to read some simple texts about smoking and its potential risks. We also told the students to list the effects they had found from the text, and to note the texts' vocabulary use and sentence structures.

In summary, these pre-writing activities helped the students identify topics for the writing, improved their knowledge of the schematic structure of personal messages, and provided them with linguistic resources such as vocabulary and sentence structure. With this knowledge and resources, the students were then encouraged to draft their own messages.

Drafting

Drafting plays an important role in the success of writing since it may minimise the writing blocks faced by all writers. Drafting is an early stage of production in which writers begin to set down their ideas in sentences (Urquhart & McIver, 2015). During this stage, we gave the students freedom to express their thoughts, emotions and hopes to their parents regarding the issue of smoking. In order to motivate them to keep writing, they were told not to worry about the quality of their texts at this drafting stage. Figures 1 and 2 present two samples of students' writing.

Figure 1. Writing sample from student A with teacher feedback.

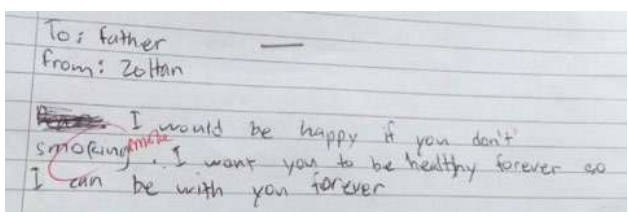
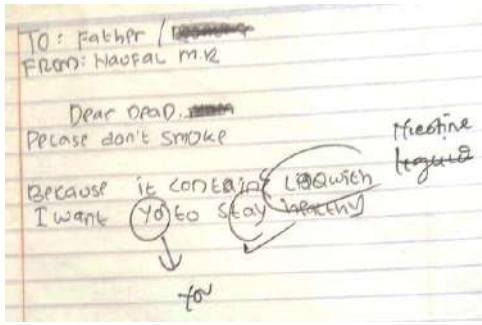


Figure 2. Writing sample from student B with teacher feedback.



During the drafting stage, one author monitored the classroom activity, supervised the students' writing progress, gave feedback and, most importantly, motivated the students to keep writing. With regard to giving feedback on the drafting stage, several studies on L1 and L2 writing have suggested that teachers' comments on preliminary drafts promote effective revision and increase the overall quality of students' writing (Ferris, 1995).

Editing and Revising

When the drafts were complete, the students were asked to edit and revise their writing. These two activities of editing and revising were intended to help them review all the information they had written, adding more ideas and removing any unnecessary parts of the text (Hamand, 2009). These activities were also intended to help students clarify the messages in their writing (Urquhart & McIver, 2015).

At this stage, the students were encouraged to work together, sharing their writing and commenting on each other's work. In addition to comments from their peers, the teachers also gave feedback during the editing stage. This feedback related mainly to problems of grammatical accuracy, diction and organisation of the writing. The students were asked to rewrite their texts based on the teachers' feedback.

Creating Postcards

Once they had finished their writing drafts, the students were asked to write the postcards. As mentioned earlier, this was intended to promote their creativity. During this stage, the students were given freedom to design a postcard and decide the layout. This was fun but challenging for the students, particularly in deciding on the kind of picture to draw, which they found difficult because they had to depict the message in their writing. We noted that the students sketched and re-sketched their pictures several times. Having drawn pictures to the best of their ability, the students then stuck them on one side of their postcards. Figure 3 shows two samples of students' drawings.

Figure 3. Samples of drawings from students C (left) and D (right).

Postcard distribution

As mentioned earlier, in addition to providing students with opportunities for real-world practice of English language use, the objective of this writing activity was to help them use their creativity to address social issues in their community. In particular, they were to use their postcards to convey the risks of smoking to their parents, relatives and other people in their social community. They called this postcard distribution activity the *Stop Smoking in Public* campaign.

When the postcards were ready, the students sent them directly to their parents and relatives. Many also distributed the cards to people at a car-free day event in the city. The students were excited to meet other people at the event and hand them the cards they had created. They also shared their thoughts about the risks of smoking with the people they met.

The students received various responses to their stop smoking campaign. Some parents appreciated their children's Stop Smoking in Public postcards and henceforth avoided smoking near their children, although, surprisingly, few parents decided to give up smoking. However, the students also received negative responses from some people who were approached while smoking at the car-free day. Although a few put their cigarettes out while talking to the students, others expressed their unhappiness.

Conclusion

In summary, all students who participated in the writing activity felt positive about it. They not only experienced the real use of English in a communicative event, but

also felt that their awareness of a social issue in the community had improved after participating in the writing activity.

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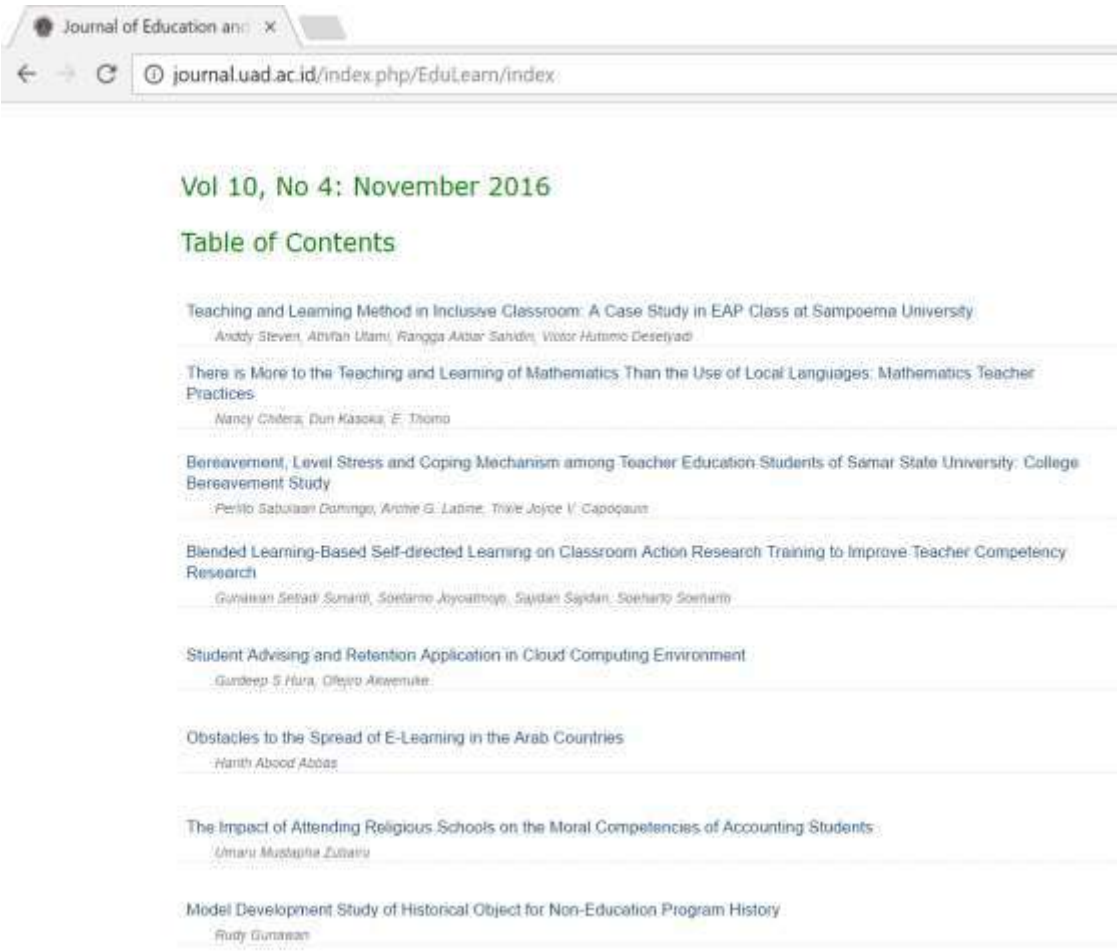

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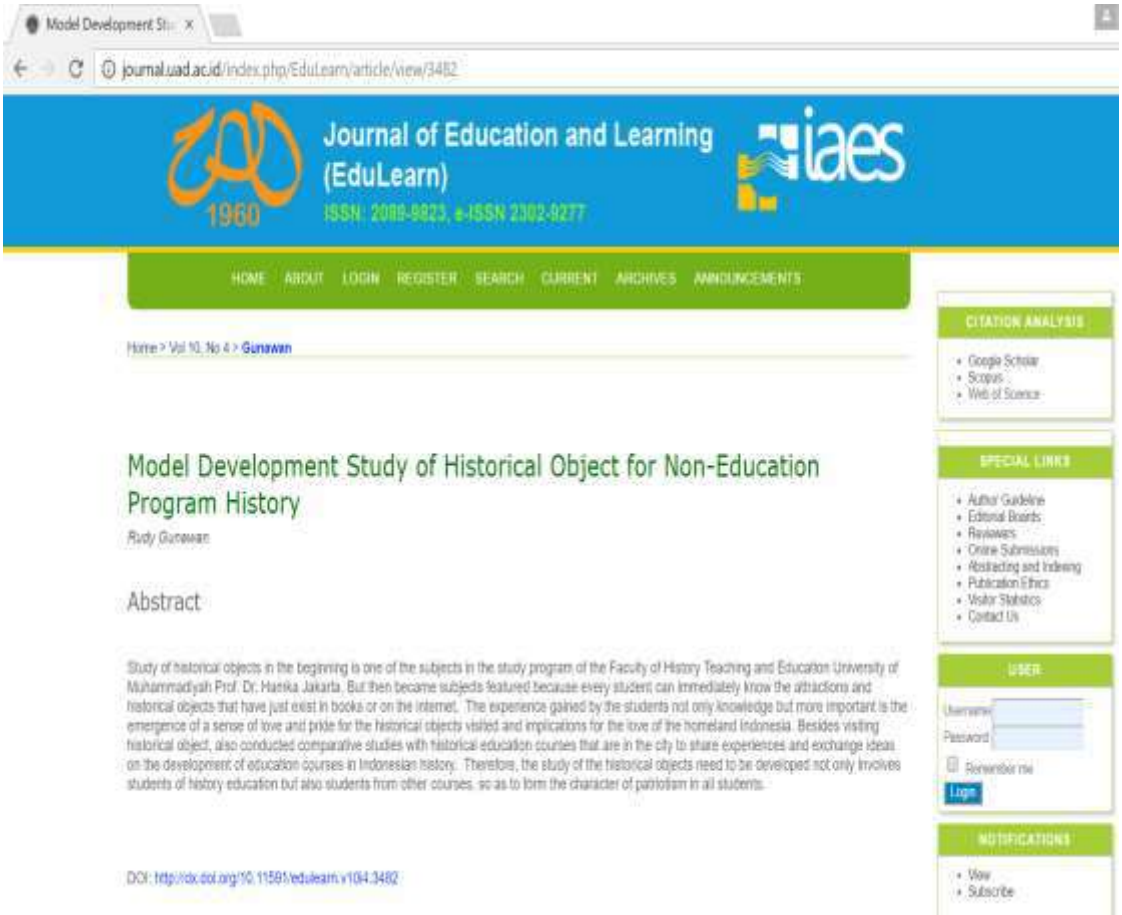

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Model Development Study of Historical Object for Non-Education Program History

Rudy Gunawan

Abstract

Study of historical objects in the beginning is one of the subjects in the study program of the Faculty of History Teaching and Education University of Muhammadiyah Prof. Dr. Hamka Jakarta. But then became subjects featured because every student can immediately know the attractions and historical objects that have just exist in books or on the internet. The experience gained by the students not only knowledge but more important is the emergence of a sense of love and pride for the historical objects visited and implications for the love of the homeland Indonesia. Besides visiting historical object, also conducted comparative studies with historical education courses that are in the city to share experiences and exchange ideas on the development of education courses in Indonesian history. Therefore, the study of the historical objects need to be developed not only involves students of history education but also students from other courses, so as to form the character of patriotism in all students.

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Model Development Study of Historical Object for Non-Education Program History

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Abstract

Study of historical objects in the beginning is one of the subjects in the study program of the Faculty of History Teaching and Education University of Muhammadiyah Prof. Dr. Hamka Jakarta. But then became subjects featured because every student can immediately know the attractions and historical objects that have just exist in books or on the internet. The experience gained by the students not only knowledge but more important is the emergence of a sense of love and pride for the historical objects visited and implications for the love of the homeland Indonesia. Besides visiting historical object, also conducted comparative studies with historical education courses that are in the city to share experiences and exchange ideas on the development of education courses in Indonesian history. Therefore, the study of the historical objects need to be developed not only involves students of history education but also students from other courses, so as to form the character of patriotism in all students.

Keywords: *Model Development, Historical Object*

Introduction

The college has a mission to search, discover, disseminate, and uphold the truth so as providers, higher education must be free of influence, pressure and any contamination as well as political and economic power so that the process of education, research and community service can be implemented based on academic freedom and scientific autonomy (Peraturan Pemerintah No 4, 2014). In education at the undergraduate level, the college of higher education is expected to produce graduates who are not only able to apply their expertise and utilize knowledge on the field but also to adapt to the situation (Lampiran Peraturan Presiden Republik Indonesia Nomor 8, 2012).

Higher education based on the National Qualifications Framework Indonesia (KKNI) implicated in learning activities that are not based on the material, because the learning outcomes in KKNI is the ability acquired through the internalization of knowledge, attitudes, skills, competence and duration of work experience. Therefore, the college is required to do a collaboration between classroom learning materials and skills to practice the material that has been obtained. Collaboration is done in the community outside the campus environment in order to improve student opinion regarding the relevance of material that has been learned in the classroom with the reality that occurs in the community.

To meet the regulatory demands, college field becomes one of the things that must be done by the lecturers so that students understand not only cognitively but has a personal and social skills. Lecture Field Work (KKL) is one of the subjects that is carried out by the study program to gain added value in higher education. Job training activities are the implications of the activities of Field Work Experience (KKN) which is a field activity is mandatory for all students of S1, but with a shorter time. Through these activities, the college believes that the program is able to encourage empathy students and contribute to the resolution of existing problems in the community. Interaction between students and the community will be fun and rewarding because each party will learn from each other on the knowledge they have (Simlitabmas, 2013).

Based on the results of research conducted by DeWitt & Storksdieck (2008) research on the field trip for the past 25 years shows that students get an effective learning experience. Although there are still obstacles in the field trip activities, but researchers continue to learn more in order that these obstacles can be overcome. Factors that become obstacles in the field trip include limited funding, lack of time, a solid curriculum, and documentation are performed by educators (Anderson, Kisiel, & Storksdieck, 2006).

History Education Studies Program FKIP UHAMKA organizes activities carried out in the community as well as reviewing historical objects called the Object Historical Studies. Implementation of these activities is the implication of one of the missions in the Program are implementing community service and develop the freedom of thought which is imbued with the spirit of monotheism scientific and moral values to form a sense of history. Thus the goal of producing program implementation of community empowerment in the form of implementation of various innovative work of the results of the

study of history and history education can be achieved. Study of historical objects is part of the learning in the field that will enrich the experience of learners.

Historical Objects study is a scientific study that aims to examine public places or historical objects. The activities promoted by the History Education courses, in an effort to equip students to participate keeping objects of cultural heritage. In addition to maintaining the cultural heritage objects, students are able to take positive values for the development itself and the public. Historical Objects purpose of the study is to sharpen the ability to think, analyze and cooperation, through the preparation of scientific reports and activities.

Objects Historical Studies is an academic activity that has a weight of 2 (two) credits and conducted in semester VII as conditional subjects. Historical studies of new objects can be reached after a student taking job training I and job training II. In the course of the historical objects of study, students are required to interact with the community and doing historical research that is supported by the assessment of economic, social, cultural and religious society. The method used in the Study of Historical Objects is a method of field study, where students, accompanied by lecturers make observations on society and heritage buildings, then compile a report that ended with a seminar report Objects Historical Studies. Benefits of activity Objects Historical Studies, this course can be applied in other courses because of the experience gained by the students not only knowledge but arises a sense of love and pride in the history of the visited objects so that love of country and nationalism will continue to grow. Objects and historical tours contains the values of national struggle increasingly long forgotten by the younger generation at this time.

Research Methods

Method of research conducted in this research is qualitative method with phenomenological approach. Through a phenomenological approach, this paper will describe activities Objects Historical Studies that have been done by the History Education Studies Program FKIP UHAMKA and how applications can sbe done in other courses besides History Education. Phenomenological approach is used because it is suitable for reviewing existing meaning in the experience and human action (Saleh, 2011). The purpose of this paper is to reveal the facts about the activities Objects Historical Studies based activities in 2014 and made the object of historical study model for other courses outside Studies History Education.

This article is expected to be useful to stakeholders as one form of contributions to the foster patriotism among students through activities Objects Historical Studies of research conducted by students of the seminar held Objects Historical Study results. Technical implementation is having made the object of historical study reports are then presented in front of the faculty and students in the History Education Studies Program. Subsequently held a question and answer session led by a moderator. Through seminars Objects Historical Study results, students are expected to have the ability in the field of research that is required for writing scientific papers, theses and academic activities in the future and be accountable for the results of research. From the results of the seminar, students can explore the things that had been unknown. For example from the discussion about Sam Poo Kong, a seminar participant asked about the evidence of the Sam Poo Kong after converting to Islam. Questions are answered by the evidence legacy in the form

Result and Disscussion

According to Tal & Morag (2009) is described as a field trip experience for students that is designed for educational purposes. The purpose can be achieved in a learning outside the classroom are:

1. To provide direct experience
2. Stimulate interest and motivation in studying a knowledge
3. To add relevance to learning and interrelationships
4. To strengthen the skills of observation and perception
5. To promote social development (Michie, 1998)

The targets of learning history is not just mastery of historical facts, not too tacking student orientation on past events. According to I Gde Widya (1999) in Suharso (2014) learning the history of the activities carried out by the students to observe dynamically the past experience of earlier generations to find concepts or big ideas in the past so as to equip students in assessing the development of the present and the future. Soedjatmoko (1976) in Suharso (2014) mentions the teaching of history was held as a shared experience between the teacher and the taught not just memorizing facts. Joint research between faculty and students become the main method. Students are directly involved in a new engagement so as to perform self-discovery as part of the Indonesian nation.

The statements above show that a researcher would not be able to do the reconstruction past when no trace, the source or the evidence. Existing sources often depends on the ability of researchers to make sense of a source. It could have been for some researchers of the topic otherwise have no source whereas according to other researchers many sources for the topic (Muhsin, 2009). The discovery of resources needed can be done in two ways, namely literature and field study. For a researcher of history, both types of research cannot be strictly separated though still to be done first is literature. Field research is a continuation of literature if the required data is still lacking. Field research conducted heuristic, it means finding and collecting sources, traces and historical evidence (Muhsin, 2009). Sources that have historical significance can be derived from the field of fiction, songs, legends, *folkfore* and proverbs.

Researchers can obtain the history of the written and unwritten sources that have not been saved and libraries or museums as artifacts and oral sources. Therefore, history teaching students not only learn in the classroom, but can be given learning outside the classroom with historical research methods. Students learn to find itself a fact of history that would be more interested in history. Starting from formulating the problem, collect and assess the validity of sources of information, build hypotheses and infer and interpret the results. One of these activities is an object of historical study as a conducted by the History Education Studies Program FKIP UHAMKA.

Event objects of historical studies conducted once a year for semester students 6. Students accompanied by the supervisor observe the problems that have been formulated in the public and heritage buildings. Long activities ranging from 6-8 days depending on the location of the place of observation. During the activity, students gather resources are then examined the validity of resources to do library research. After completing the activity, students can make a hypothesis, deduce and interpret the research results through reporting activities and seminars Objects Historical Study report.

In the course of the historical objects of study, students are invited to think of history that has the ability to think chronologically, periodization, causality and diachronic and synchronic thinking skills necessary to understand a historical event in the past, present and future (Syukur, Gunawan, Supriatna, & Sunjayadi, 2013, p. 34). For example, the ability to think chronologically will appear when the student must report the number of incidents or events in order of time of the visit in the study area of the historical objects began to leave until the return and any activities not only recorded the time sequence of events but emphasizes the link between the events of the first with next.

Historical objects of study activities to train students to conduct historical research. The study of history is one of the research regarding the collection and evaluation of data systematically, related to the events of the past to test hypotheses relating to the factors that cause, effect or the development of current events and anticipate upcoming events (Sukardi, 2003). Historical research also relates to a procedure, process, or technique in the systematic investigation of a particular discipline to get the object (materials) to be studied (Sjamsuddin, 2007). Historical research is basically the study of historical sources, the implementation of the phases of activity covered by the historical method is heuristic, criticism, interpretation and historiography (Syukur, Gunawan, Supriatna, & Sunjayadi, 2013).

Historical research conducted in the study of the historical objects is a simple research activities. Starting with a heuristic process that is generating activities and find the necessary resources, both internal and external criticism that testing critical of the source is found, and produce simple historiography works in accordance with the purpose of the study of historical objects in the form of writing and presentation or exposure.

One of the activities object of historical study that has been done departing from the theme "Exploring Local Wisdom with History" conducted in five (5) historical objects that Sam Poo Kong temple and *Lawang Sewu* in Semarang, *Kauman* and Center of Silver Handicrafts in Yogyakarta and Village *Sembungan* The Temple Complex Dieng. The activities carried out from 10th s.d. February 15, 2015 and is divided into 5 (five) groups. The activity generates simple historiography in the form of scientific papers with title (Gunawan, Armiyati, & Naredi, 2014):

1. Development of Railways in Semarang (Object Study: *Lawang Sewu*)
2. Study of Chinese Society in Semarang (Object Study: Sam Poo Kong)
3. The development of Muhammadiyah in Yogyakarta (Object Study: Kauman)
4. Development of Silver in Yogyakarta (Object Study: Kotagede)
5. Social Life Culture Society Dieng Temple Complex (Objects Study: Rural Sembungan, Dieng).

To strengthen the results of research conducted by students of the seminar held Objects Historical Study results. Technical implementation is having made the object of historical study reports are then presented in front of the faculty and students in the History Education Studies Program. Subsequently held a question and answer session led by a moderator. Through seminars Objects Historical Study results, students are expected to have the ability in the field of research that is required for writing scientific papers, theses and academic activities in the future and be accountable for the results of research.

From the results of the seminar, students can explore the things that had been unknown. For example from the discussion about Sam Poo Kong, a seminar participant asked about the evidence of the Sam Poo Kong after converting to Islam. Questions are answered by the evidence legacy in the form of anchors and their mosques were right at the pagoda that shows Muslim admiral Zheng Ho is derived from the Chinese (2014). Questions and answers appear in the seminar to train students to think of causality. Thinking of causality regarding the causal relationship between two events or more. Knowledge of these relationships is needed to answer why an event occurs.

Based on an examination of the historical object of study activities carried out by the History Education Studies Program FKIP UHAMKA show students the skills needed to be able to apply the knowledge acquired so as to produce a simple historiography. Moreover, this activity is able to explore and broaden students about historical events so as to foster a sense of patriotism.

Given this reality, Historical Objects Study subjects can be applied in other courses outside Studies History Education. Other courses of study subjects can obtain historical objects reminiscent of the concept of history as a science which depends on the history of the human experience in the form of artifacts and documents (Syukur, Gunawan, Supriatna, & Sunjayadi, 2013). Existing documents or artifacts can be studied not only by historians in finding the facts. It is based on any field of the object has a history and has experience as beings who continue to live and develops.

The study of historical objects capable of improving cognitive and affective abilities of students. Although the impact on cognitive ability is relatively small but this can be overcome by designing a research report that the stages of historical research can be done. The same thing was stated by Storsdieck, et.al (2006, 2007) in DeWitt & Storksdieck (2008) that cognitive learning in the field trip remains an important part of a journey undertaken although not too long. Teachers and principals may consider ways to maximize results in getting the learning experience.

Historical research method is applied as a common thread in the study of historical objects. So that every student in any study program can study the historical research as a complement to other methods of research. Model studies of historical objects with historical research of this approach can actually be implemented in the entire course with emphasis in accordance with their respective disciplines. As a review, here are some courses that can carry out this historical model of the object of study:

1. English Studies Program
   One graduate of English Studies Program is to become a tour guide. A tour guide should have knowledge of the history of the places designated so that if at the time I was in college, students are given a model study of historical objects with historical research approach, travelers can explain to a more comprehensive manner, not just a show place but also a history of attraction visited.
2. Economic Studies Program
   Human activities in the economic field in the past can become the object of study in the historical object of study subjects. For example, to determine the origin of money as an economic, students can be invited to visit the museum of Bank Indonesia as a field of study and to study literature in the library of Bank Indonesia. In addition, some form of production activities can also be the object of study. Suppose students are invited to visit the factory toothpaste and reviewing and researching methods of historical research, so that students can know the history of the manufacture of toothpaste from the past until now.
3. Geography Studies Program
   History and Geography as two sides of a coin that can not be separated because of any historical event is always associated with the geography. Both can support each other in the collection of data and the search for historical sources. Geography Studies Program students can be invited to conduct a study of historical object to the entire object history as the science of history must consider space and time. Someone whose background geography can be a historian to study the historical research. Geography student may be invited to conduct a study of historical objects to the old city of Jakarta with the research object port of Sunda Kelapa. Students can search for the facts and the source of the attack Sultanate of Demak views of geographical location.

Research conducted by Behrendt & Franklin (2014) showed that students who participate directly on learning in the field resulted in a positive attitude about the subject. The same is shown by Cwikla (2009) that learning in the field can attract students on a subject, even in the classroom the student is not showing interest. Learning by doing is more effective than the lecture method of teaching done by teachers (Hackathorn, Solomon, Blankmeyer, Tennial, & Garczynski, 2011). Basically, this historical model of the object of study can be applied in all existing courses at any college, because human life cannot be separated from her past. By studying history through the study of historical objects, students will get direct experience of visiting the objects of history in Indonesia so as to foster a sense of love and pride for Indonesia.

Conclusions

1. Study of the historical objects are academic activities by visiting historical attractions in the region agreed with historical research methods and aims to equip students to participate keeping objects of cultural heritage.
2. Study of the historical objects can be developed as a model of courses that can be applied across existing courses in college by searching for historical objects related to the course of study concerned.
3. Students can sharpen thinking skills, analysis and collaboration through historical research into methods of assessing to report the study of the historical objects.

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NATIONAL, SECTORAL AND SPATIAL PERSPECTIVES ON TECHNICAL EFFICIENCY AND RETURNS TO SCALE IN INDONESIAN ECONOMY

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ABSTRACT

This paper presents the results of analysis on technical efficiency and return to scale in the Indonesia on the national, sectoral and spatial perspectives. National analysis was based on a macroeconomics cycles: oil booming phase (1967-1981), recession phase (1982-1986), deregulation phase (1987-1996), multi-dimension crisis phase (1997-2001) and economic recovery phase (2002-1013) and the government regime: the New order (1966-1998) and Reformation governments (1999-2014). Sectoral analysis was based on the 9 sectors classification, namely: Agriculture, Mining and Quarrying, Manufacturing, Electricity, Gas and Drinking Water, Construction, Trade, Hotel and Restaurant, Transportation and Communication, Finance, Rental and Corporate Services, and Services. Spatial analysis focused on seven groups of islands: Sumatera, Java, Kalimantan, Sulawesi, Bali-Nusa Tenggara, Maluku, and Papua. Cobb Douglass production function was employed to calculate technical efficiency and return to scale using regression analysis. Data on Gross Domestic Product, Capital stock and Employment of the year of 1967-2013 used for national analysis, data of year 1967-2007 for sectoral analysis and data of 1983-2013 for spatial analysis. The results show that firstly, technical efficiency during the New Order Government was better than those during Reformation Government. Secondly, those sectors in which the coefficients were above that at the national level, experienced decreasing returns to scale. On the contrary, those sectors in which the coefficients were below that at national level, experienced increasing returns to scale. Thirdly, the provinces with coefficients of technical efficiency below that at national level exhibited increasing returns to scale. Otherwise, the provinces with coefficients of technical efficiency above that at national level exhibited decreasing returns to scale.

Keywords: *Technical efficiency; return to scale; national; sectoral; spatial.*

1. INTRODUCTION

Economists have long recognized that technology is a factor of production, and even the most important factor, given its role in labor quality and the design of capital good. Technological advances play a crucial role in improving productivity and thus the standard of living of a system; economic system (Adam, 2006). Most economists today agree with the hypothesis that both innovation and technological spillovers was the main engine for explaining productivity growth.

Measuring the effect of technology on productivity is a difficult pursuit. It is generally approached through metrics such as Gross Domestic Product, GDP per capita and Total Factor Productivity (TFP). The former two attempt to capture the overall output of a given economy from a macro-environmental perspective. The latter is attempting to measure technologically driven advancement through noting increase in overall output without increases in input. This is done through utilizing production function equations and identifying when the output is greater than the supposed input, implying an advance in external technological environment (Boundless, 2016).

Technology can be regarded as primary resource in economic development. The level of technology is also an important determinant of economic growth. The rapid rate of growth can be achieved through high level of technology. It was observed that innovation or technological progress is the only determinant of economic progress. However if the level of technology becomes constant the process of growth will stops. Thus, it is the technological progress which keeps the economy moving. Inventions and innovations have been largely responsible for rapid economic growth in developed countries (Debasish, 2016).

In economics, the Cobb-Douglas production function is widely used to represent the relationship of an output to input (Bao Hong, 2008). It was proposed by Knut Wicksell (1851-1926) and tested against statistical evident by Charles Cobb and Paul Douglas in 1928. From Cobb-Douglas production function, technical efficiency also known as total factor productivity and returns to scale can easily be calculated by employing regression analysis (Salvatore, 1996).

Since the declaration of Indonesian independence on 17 August 1945, the Indonesian economy has been up and down, experiencing booming and recession (Galih Adhidarma, 2015). Economic cycle such as booming, recession and even economic crisis have been exist in the Indonesia economy. Socia Prihawantoro et al., (2009) have indicated that few phases in Indonesia economy during the year of 1967 to year 2013, namely: oil booming (1967-1981), recession (19082-1986), deregulation (1987-1996), multi-dimension economic crisis (1997-2001), and economic recovery (2002-2013). Indonesian economy during the era of New Order under Suharto presidency (1966-1998) and during the era of Reformation (1999-2014) run by Habibie Presidency (1998-1999), Wahid Presidency (1999-2001), Megawati Presidency (2001-2004) and Yudhoyono Presidency (2004-2014)has shown clearly the economy's business cycle, up and down over time.

Structural transformation process in the Indonesian economy is indicated initially by the dominance of agricultural sector both in output and in employment. The primary sector, namely: Agriculture and Mining-Quarrying dominated the Indonesian economy until 1987-1988, but Secondary (Manufacturing) and Tertiary Sectors (Trade, Hotel and Restaurant) have replaced this position after 1999 in term of output. But, in term of employment, data show that during the year of 1967 to 2007, Agriculture has still dominated the Indonesian economy.

According to the theory of location, it is reasonable view that economic growth unevenly happened in a national economy. Regional disparities do exist in Indonesia economy. There are some regions that grow

very fast and there are others that grow very slowly. In Indonesia, some provinces grow very fast such as provinces in Java Island and those in Sumatera Island. Some others grow very slowly, such as in West Nusa Tenggara and in East Nusa Tenggara.

Previous research on technical efficiency and return to scale, among others: Biresh K. S., at al., (2014), Krivonozhko,V. E. at al. (2007), Tewodros G. G. (2008), Feng, G and Serletis, A .(2010), Nondo, C. (2014), Holyk, S. (2016), Jatto. N. A. (2013), Page, J. M. Jr., (1980), Erkoc, T. E.(2012), Kui-Wai Li, at al. (2007), and Yudistira, D (2004). Measuring Indonesia's sectoral efficiencies has been conducted by Rizaldi Akbar (2015) and Muchdie, M. (2016). As far, no study on Indonesian's regional technical efficiency has been conducted.

The research reported in this paper aimed at analyzing the coefficient of technical efficiency and return to scale of the Indonesia economy during the era of New Order (1967-1998) and the era of Reformation (1999-2013). This time frame is also disaggregated into the phases of economic' cycles, such oil booming phase (1967-1981), recession phase (1982-1986), deregulations Phase (1987-1996), multi-dimension crisis phase (1997-2001) and economic recoveryphase (2002-1013). At sectoral level, the study focus on 9 sectors classification, namely : Agriculture, Mining and Quarrying, Manufacturing, Electricity, Gas and Drinking Water, Construction, Trade, Hotel and Restaurant, Transportation and Communication, Finance, Rental and Corporate Services, and Services. At spatial aspect, this study focus on seven groups of Islands, namely : Sumatera, Java, Kalimantan, Sulawesi, Bali-NusaTenggara, and Maluku and Papua.

2. METHODOLOGY

Cobb-Douglas production function, $Q = \gamma K^{\alpha} L^{\beta}$, was employed in this exercise to calculate technical efficiency (γ), returns to scale ($\alpha + \beta$), output-capital elasticity (α) and output-labor elasticity (β). This production function was developed and statistically tested by Cobb, C. & Douglas, P. (1927-1947), where:

Q = total production (the real value of all goods and services produced in a year;

K = capital input (the real value of all machinery, equipment, and building;

L = labor input (the total number of person-hours worked in a year;

γ = technical efficiency in production process, known as total factor productivity;

α = output-capital elasticity;

β = output-labor elasticity.

Technical efficiency (γ), or total factor productivity (TFP) is the portion of output not explained by the amount of input used in production (Comin, 2006). This is a method of measuring overall productivity of business, industries or economies. Technical efficiency is the effectiveness with which a given set inputs is used to produce an output. An economy is said to be technically efficient if an economy is producing the maximum output from the minimum quantity of inputs, such as labor, capital and technology. Technical efficiency is related to productive efficiency which is concern with producing at the lowest point on the short run average cost curve. Thus productive efficiency required technical efficiency (Pettinger, 2012).

The values of α and β are basically determined by available technology. Output elasticity measure the responsiveness of output to a change in levels either capital or labor used in production. Furthermore, if $\alpha + \beta = 1$, the production function has constant returns to scale, meaning that doubling the usage of capital (K) and

labor (L) will also double output (Q). If $\alpha + \beta < 1$, returns to scale are decreasing and if $\alpha + \beta > 1$, returns to scale are increasing.

The output elasticity of capital, $E_K = \delta Q/\delta K. K/Q = \alpha Q/K. /Q = \alpha$. Similarly, the output elasticity of labor, $E_L = \delta Q/\delta L.L/Q = \beta Q/L. L/Q = \beta$ and $E_K + E_L = \alpha + \beta$ = return to scale (Salvatore, 1996). Converting the production function from $Q = \gamma K^{\alpha} L^{\beta}$ in to a logarithms form that is, $\ln Q = \ln \gamma + \alpha \ln K + \beta \ln L$. As this is a linier form, then the coefficients (γ,α and β) can easily be estimated by regression analysis (Gaspersz. 1996). The Cobb-Douglas production function can be estimated either from data for a single firm, industry, region or nation over time using time-series analysis or for a single firm, industry, region or national one point in time using cross-sectional data (Salvatore, 1996).

Data needed for this exercise were sectoral data on Gross Domestic Regional Product, Regional Capital Stock and Regional Employment. Yearly data on GDRP, Regional Capital Stock and Regional Employment were collected from the National Statistics Agency. Data for analyzing technical efficiency at national level were for the year of 1967-2013. Meanwhile data for analyzing technical efficiency at sectoral level were data for the year of 1967-2007 and data for analyzing technical efficiency at spatial level were data for the year 2003-2013.

3. RESULTS AND DISCUSSIONS

Table 1 provided results of calculation using an easy and user friendly Excel software of Microsoft Office. Technical efficiency, or total factor productivity of the Indonesian economy during the year 1967 to year 2013, was 2.78. In the New Order era the coefficient was 3.08 which were higher than that of the Reformation Government, 2.98. It means that technological progress during the New Order era was better than that of the Reformation Government. Even, the progress of technical production was higher than that at the national level. Table 1 also shows that both during the two eras of Indonesian Government have experienced the decreasing returns to scale. The coefficients of returns to scale during the Reformation Government were 0.75 a bit higher than that of the New Order Government, 0.70. Both were a slightly lower compared to that at the national level (0.78).

Table 2 provides results of calculation from regression analysis. All the coefficients of technical efficiency during the Indonesia economics' business cycle were higher than that at national level (2.78). The technical efficiency coefficient at the recession phase (1982-1986) was 6.88 and at the multi-dimension crisis phase (1997-2011) was 5.86. These two coefficients were the highest. Except the coefficient of technical efficiency at the economic recovery phase (2.70), all of these coefficients were higher than that at the national level.

Table 3 presents the coefficients of technical efficiency and returns to scale during 1967 to 2007 both at national level and sectoral level. Technical efficiency in Indonesian economy during the year 1967 to 2007 was 2.77. At sectoral perspective the coefficients of technical efficiency vary among sectors. From 9 economic sectors, 4 sectors had coefficients of technical efficiency which were above of that at national level, and other 5 sectors were below that at the national level. The sectors which the coefficient of technical efficiency above of that at national level was: Electricity, Gas and Drinking Water (12.04), Mining and Quarrying (5.30), Construction (4.91), and Manufacturing (4.31). The sectors which the coefficient of technical efficiency below

of that at national level were: Financial, Rental and Corporate Services (-1.47), Agriculture (-0.69), Services (1.93), Trade, Hotel and Restaurant (2.49) and Transportation and Communication (2.72). It means that the technical efficiency of 4 sectors earlier were better than that at the national level. Meanwhile the coefficients of technical efficiency of 5 other sectors were worse than that at the national level. These 5 sectors should have got more attention by policy makers, especially those that the values of the coefficient were negative.

At national level, Indonesian economy experienced decreasing returns to scale. The coefficients of returns to scale vary among sectors, where 5 sectors were increasing returns to scale and 4 sectors were decreasing returns to scale. Five increasing returns to scale sectors were: Financial, Rental and Corporate Services (2.13), Services (1.32), Agriculture (1.20), Transportation and Communication (1.19), and Trade, Hotel and Restaurant (1.03). These 5 sectors experiencing increasing returns to scale were the sectors in which their coefficients of technical efficiency were below of that at the national level. Four decreasing returns to scale sectors were: Manufacturing (0.67), Mining and Quarrying (-0.23), Electricity, Gas, and Drinking Water (-0.34), and Construction (-1.14). Again, those sectors that had the coefficient of technical efficiency above that at national level experiencing decreasing returns to scale.

Figure 1 presents the quadrant of technical efficiency (above Versus below National Average) and returns to scale (Increasing Returns to Scale Versus Decreasing Returns to Scale). Four sectors in which the coefficients of technical efficiency were above that at national level also exhibiting decreasing returns to scale. Those sectors were: Mining and Quarrying, Manufacturing, Electricity, Gas and Drinking Water and Construction. Other five sectors in which the coefficients of technical efficiency were below that at national level, exhibiting increasing returns to scale. Those sectors were: Financial, Rental and Corporate Services, Services, Agriculture, Transportation and Communication, and Trade, Hotel and Restaurant.

Figure 2 presents the quadrant of technical efficiency's coefficient (above and below that at national level) and returns to scale (increasing and decreasing returns to scale). The group of islands with the coefficients of technical efficiency that was higher than that at national level also exhibited decreasing returns to scale. These groups of islands were Kalimantan, Maluku and Papua. The others with the coefficient of technical efficiency less than that at national level and exhibited increasing returns to scale were Sumatera, Java, Sulawesi and Bali-Nusa Tenggara.

As shown in Figure 3, provinces in which the coefficient of technical efficiency above that at national level and exhibiting decreasing returns to scale were: Nangro Aceh Darussalam, North Sumatera, Riau, The Island of Riau, South Sumatera, Bangka-Belitung, Yogyakarta, South Kalimantan, East Kalimantan, Gorontalo, Bali, Maluku, North Maluku and Papua. Other provinces in which the coefficients of technical efficiency below that at national level and exhibiting increasing returns to scale were : West Sumatera, Jambi, Bengkulu, Lampung, Jakarta Capital City, Banten, West Java, Central Java, East Java, West Kalimantan, Central Kalimantan, North Sulawesi, Central Sulawesi, South-East Sulawesi, West Sulawesi, South Sulawesi, West Nusa Tenggara, East Nusa Tenggara, and West Papua.

The study of technical efficiency and returns to scale usually conducted in a firm or industry level as technical production was more homogeneous at the firm level. In the national, sectoral and spatial economy, there might be a risk in aggregating technology. The different time fame of the study is another limitation of the study.

4. CONCLUSION

From above discussions, it could be concluded that firstly, at national perspective, technical efficiency during the New Order Government was better than those during Reformation Government. Secondly, at sectoral level, those sectors in which the coefficients were above that at the national level, experienced decreasing returns to scale. On the contrary, those sectors in which the coefficients were below that at national level, experienced increasing returns to scale. Thirdly, at spatial perspective, the provinces with coefficients of technical efficiency below that at national level exhibited increasing returns to scale. Otherwise, the provinces with coefficients of technical efficiency above that at national level exhibited decreasing returns to scale.

It could be suggested that the sectors or provinces with the coefficients of technical efficiency higher than that at the national level not to increase the inputs of production as the economy experiencing decreasing returns to scale. Meanwhile the sector or provinces that had the coefficients of technical efficiency lower than that at the national level to increase all inputs in production in order to increase output as the economy experiencing increasing returns to scale.

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Table 1: Coefficient of Technical Efficiency (TE) and Returns to Scale (RTS) during The New Order and the Reformation Governments.

Indonesian Economy	***TE***	***RTS***
All Period (1967-2013)	2.78	0.78
New Order Government (1967-1998)	3.08	0.70
Reformation Era Government (1999-2013)	2.98	0.75

Source: Data Analysis

Table 2: Coefficient of Technical Efficiency (TE) and Returns to Scale (RTS) Based on the Indonesia Economy's Cycles.

Indonesia Economy's Cycle	***TE***	***RTS***
All Phases (1967-2013)	2.78	0.78
Oil Boom Phase (1976-1981)	3.78	0.57
Recession Phase (1982-1986)	6.88	-0.13
Deregulation Phase (1987-1996)	2.80	0.71
Multi-dimension Crisis Phase (1997-2001)	5.86	0.24
Economic Recovery Phase (2002-2013)	2.70	0.80

Source: Data Analysis

Table3 Coefficients of Technical Efficiency (TE) and Return to Scale (RTS) Based on Economic' Sectoral Activities.

Sectoral Analysis	***TE***	***RTS***
National Average	2.77	0.78
Agriculture	-0.69	1.20
Mining and Quarrying	5.30	-0.23
Manufacturing	4.31	0.67
Electricity Gas Drinking Water	12.04	-0.38
Construction	4.91	-1.17
Trade, Hotel & Restaurant	2.49	1.03
Transportation & Communication	2.72	1.19
Financial, Rental & Coorporate Services	-1.47	2.13
Services	1.93	1.32

Source: Data Analysis

Technical Efficiency	***Increasing Returns to Scale***	***Decreasing Returns to Scale***
Above National		Mining and Quarrying Manufacturing Electricity, Gas and Drinking Water Construction
Below National	Financial, Rental and Corporate Services Services Agriculture Transportation and Communication Trade, Hotel and Restaurant	

Figure 1: Quadrant of Technical Efficiency (TE) and Returns to Scale (RTS): Sectoral Level.

Technical efficiency	***Increasing Returns to Scale***	***Decreasing Returns to Scale***
Above national		Kalimantan Island Maluku Islands Papua Island
Below national	Sumatera Island Java Island Sulawesi Island Bali-Nusa Tenggara Islands	

Figure 2: Quadrant Technical Efficiency (TE) and Returns to Scale (RTS): Seven Big Islands.

Technical efficiency	***Increasing Returns to Scale***	***Decreasing Returns to Scale***
Above national		Nangro Aceh Darussalam North Sumatera Riau The Island of Riau South Sumatera Bangka-Belitung Yogyakarta South Kalimantan East Kalimantan Gorontalo Bali Maluku North Maluku Papua
Below national	West Sumatera Jambi Bengkulu Lampung Jakarta Capital City Banten West Java Central Java East Java West Kalimantan Central Kalimantan North Sulawesi Central Sulawesi South-East Sulawesi West Sulawesi South Sulawesi West Nusa Tenggara East Nusa Tenggara West Papua	

Figure 3: Quandrant of Technical Efficiency (TE) and Returns to Scale (RTS): Provincial Level.

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Religion Conflicts in Indonesia Problems and Solutions

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Abstract

Religious perspectives which place religion as a source of conflict have initiated various attempts to reinterpret and accordingly find some common ground at a certain level which hopefully may reduce conflicts among religious communities due to the existence of mutual tolerance. At the exoteric level, religions are different, but at the esoteric level, religions are not similar. All religions are viewed as equally valid paths toward God. However, in many ways, the reality shows that the tension among religious communities is closely related to the factors that are beyond the scope of religion. It is important for all religious believers to keep the peace among them. As far as the record of religious conflicts in Indonesia is concerned, it shows three major patterns: conflicts among adherents of different religions, conflicts between one religion with a group accused as heretical, and internal conflicts of the same people of faith with those who have different understanding of the religion. In any point of views, however, such conditions would be so detrimental to the human race in general, and society and the state of Indonesia in particular. This paper examines intensively about the issues and attempts to uncover the nature of the root-causes underlying them.

Keywords

Religious conflict, problems, solutions to problems

Indonesia has a very pluralistic society in which people from various backgrounds of tribes, races, and religions live together. In terms of religion, there exist the great world religions, namely Hinduism, Buddhism, Christianity, and Islam. According to the 2010 census, the percentage of the adherents of the religions is as follows: Islam (88%), Protestantism (6%), Catholicism (3%), Hinduism (2%), Buddhism (1%), and Konghucu (.05%).

Based on the figures above, this multiracial, multicultural, multi-religion, and multi-language country demands badly tolerance in religion. A positive vision concerning the diversity becomes a necessity. Diversity in religion may not hamper the social relationship. However, religion is an instrument for integration in certain community, whereas for others, it becomes a factor of disintegration taking place among the different adherents. Religion has become such a sensitive issue for some communities in Indonesia, by which some social or political conflicts which in nature are not religions issue have been drawn into one to gain support from its adherents. Religions in this case, are of very strong allure and easily provoking to cause tensions among religious

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societies. The tensions are caused by the following situations: (1) Religious people tend to "monopolize" the truth of their religion and consider the others false. This perception may trigger the holy war which is waged as an arena to defend the faith; and (2) The followers behave conservatively based on the thought that the truth is only in them (dogmatic) and this has led to neither critical dialogue nor tolerance to other religions.

Based on this issue, the two packages often become the main and permanent problems in the form of harassment/misappropriation regarding religion and worship house. These two problems become the main issues in the recent years in Indonesia which, so often, turn out to be violence that cannot be overcome properly. The two religious perspectives implied that there exists a religious community who rules out others. Relating a religion to any potential trigger of violent is not easy. A religion is regarded as a faith which is always associated with values, peace, and safety. In contrast, violence may cause damage, destruction, or even death. The peaceful portrait of a religion cannot be attached to the harsh face of violence. Some facts prove that religions may cause violence. The adherents use the religion doctrine, main drive, premium mobile to commit violence.

Violence in the name of religion is often interpreted by some as a legal doctrine that is mandatory to be implemented. Violence in the name of religion can be translated as violence which involves a religion as a premium variant. Violence entails power and pressure regarding religious issues on Indonesian people. Thus, the social and political conflicts which were not concerned about religion were often drawn into religious territory to gain more support from its adherents.

From any angle of perspectives, such a condition would be very detrimental to mankind in general, and the community as well as the state of Indonesia in particular. In fact, Indonesia with a variety of characters was once known as a model of a tolerant country where people of different religious backgrounds could live together in harmony. However, the emergence of a number of conflicts between religious groups during the recent decades has made Indonesia be better known for its history of conflicts.

Based on the religious conflicts that occur in Indonesia, the affecting factors have been identified as follow: (1) society relationships to the government; (2) dissemination of religious teachings supported by militant action; (3) the crisis of authority in certain groups and among social groups within the community; (4) the phenomenon of the relationship between races and religions (Chinese Christian and the relevant fundamentalist); and (5) strategy to mislead multi-culturalism. These situations might create a rift between religious communities. Based on such point of view, the urgent need to be considered by Indonesians is the redefinition of religious attitude which is good and right in the middle of a pluralistic society. This is an important agenda to discuss, so that the plurality of religious communities does not cause tension, conflict, and rifts among religious adherents. Among the methods that must be developed in order to foster harmony in the community of multi-religion such as Indonesia is the development of attitude of tolerance among religions.

The author argues that the religious conflicts need to be differentiated based on the type of religious issues as the source of contention. Therefore, in this paper, "religious conflict" or "conflict with the nuance of religion" is defined as "a conflict which involves values, claims, and identity regarding religious issues or issues which are framed in a slogan or religious expression".

RELIGION, CONFLICTS, AND SOCIAL INTEGRATION

The classic definition of conflict proposed by Louis Coser is: "a struggle over values and claims to secure status, power, and resources, a struggle in which the

main aims of opponents are to neutralize, injure, or eliminate rivals".

This definition reveals one among several weaknesses in various explanations of conflict, including ethnic-religious conflicts. Jacques Bertrand said, "In general, theories of ethnic conflict have been poor at differentiating between forms of conflict and better at developing theoretical propositions about the causes of all forms of ethnic conflict". In a more general context, Bertrand's statement may be understood as an indication that a lot of explanations of conflict, including ethnic conflict-religious do not pay much attention to the variations or peculiarities forms of conflict. Indeed, religious conflicts emerge in certain time and location, whereas other types occur in different occasion.

The worst impact of such conflicts is the loss of the inter-religious tolerance. It should be realized that at the level of exoteric, religions (sharia) are indeed different, yet at the esoteric level (culture), they are all the same. All religions are ultimately viewed as the equally legitimate paths toward the one and only God. Effendy (2001: 24) said, the reality shows that tensions between religious communities in fact are closely related to factors that are beyond the scope of the religion itself. Due to the sensitive nature of religion, then everyone is leaning in the name of religion. This situation is a very complicated problem which is faced by a community of various religions.

SEVERAL CASES OF RELIGIOUS CONFLICT IN INDONESIA

Since the downfall of Soeharto, followed by the emerging of Reformation Governance of Habibie, Abdurrahman Wahid, physical violence and mass murder of several formats had been already underway in certain parts of the provinces in Indonesia. According to Thontowi (2003: 48), the local confrontation and conflict, both involving ethnics and religions which trigger social disharmony are alarming. Among the major cases that surfaced during the recent years are Sunni in East Java, the Islamic Defenders Front (FPI), and the Case of Tolikara in Papua.

The Conflict Between Sunni and Shia in East Java

East Java, in which the majority of Moslems adhere to the tradition of NU (Nahdlatul Ulama), is one of the main basis areas of the spread of Shia mainstream. The Shia missionary movement began to emerge in the era of 80s. Shiite groups in East Java built their base in Tapal Kuda and the surrounding area. Therefore, the area of conflict between the Shia and NU often located in the vicinity of Tapal Kuda or in the areas in which the nadliyyin base was strong enough, such as Madura. After a long time living in the absence of religious conflicts, people in East Java were again stunned by a violent incident in the name of religion. The bloody incident taking place in Puger felt like lightning during the daylight that surprised many. Before the outbreak, the public still recall the case of conflict and similar issues that previously occurred in the Karanggayam and Bluuran Villages in Sampang Regency. The conflict that led to mass violence caused hundreds of suspected followers of the Shia to take refuge in Sidoarjo for the sake of stability and conducive society. In this province, the escalation of the conflict with Sunni-Shia issue was constantly increasing and the resistance against Shia teachings got intensified and more widespread in the community. Thus, it is not surprising that afterwards, conspiratorial assumptions which accompanied the series of Sunni-Shiite conflicts in East Java surfaced. It is assumed that the Sunni-Shiite conflict is designed on a purpose which involved transnational force.

On Sunday, March 22, 2014, the church of St. Stanislaus Kostka that would be built in Bekasi swarmed with the FPI. As reported by Metrotvnews.com, around 150 members of the FPI asked for the termination of construction of St. Stanislaus Kostka Church in Bekasi. FPI' refusal was

due their opinion that the construction was actually rejected by local communities. In the view of Moslems, FPI's behavior is unacceptable, because the right to build a house of worship is a right that should be protected anywhere in Indonesia. Neither Islam nor Christianity ever banned the construction of houses of worship. Throughout the history, there were religious leaders who attacked the place of worships. However, it is almost certain that it was done by those of narrow thoughts and it was not a proper pattern to follow. Any religion would not prohibit the construction of the worship place as it is a place where people learn to draw near to God, worship God, and celebrate their religious feast. The worship place is where people learn the virtue. Of course, sometimes there are bad preachers who are happy to spread hatred. But the presence of religious leaders of this kind is certainly not a valid reason to ban the construction of worship place or the existence of a religion. Moreover, in this case, no indications were found that the church would be an instrument to spread hatred.

In the case of burning mosque in Tolikara, Papua, when Eid Al-Fitr was celebrated on Friday, July 17, 2015, the conflict was not merely caused by the religious issue. Several factors such as local politics, social jealousy, and security also contributed to the conflict. Trends in local politics in Indonesia could easily lead to conflict. The existence of the Special Autonomy Law of Papua has caused tension and an identity claim was made to distinguish the indigenous people from immigrant. In addition, the better economic status of the immigrants triggered social jealousy on the side of local residents. An opinion states that Moslem immigrants, despite their staying of 30 years, were still called immigrants. However, in Papua there are particularly too many repressive measures undertaken. The actions of security personnel could be one factor that led to problems during the conflict in the area. Peace in Papua can be reached through customary law. To that end, the government should provide the necessary support. Governments need to promote dialogue approach to all relevant parties. The settlement by means of customary law should be based on local customs, that different area should have their respective methods. In this case, people have to find their own process to settle the issue and the government should provide support where the customary law becomes a possible solution.

SOLUTIONS TO THE PROBLEMS

Several solutions to religious conflicts that occurred in Indonesia are:

(1) Religious dialogue (interfaith dialogue). As mentioned above, in order to break the ice that occurs among religions, the possible alternative would be the religious dialogue mechanism, known also by the term of interfaith dialogue. This interfaith dialogue is expected to lead the religious adherents to an inclusive and open way of life that they may arrive on the concept of "unity in diversity" and "to life together" based on theological pluralism.

(a) A parliamentary dialogue: This dialogue is carried out by involving the world religious leaders with some examples of the already established World's Parliament of Religions and the already conducted Conference on Religions and Peace, and the World Congress of Faiths aiming to develop cooperation and peace among religious communities in the world;

(b) The institutional dialogue: This dialogue is carried out by involving religious organizations aiming to discuss and solve problems of the religious people and develop communication among religious organizations as the Alliance of Indonesian Churches (PGI) for the Protestants, WALUBI (the Masters of Indonesian Buddhists), the Conference of Indonesian Bishops (KWI) for the Catholics, the Association of Indonesian Hindu-Dharma, and the Council of Indonesian "*Ulamā*" (MUI) for the muslims;

(c) Theological dialogue: This method aims to discuss theological-philosophical issues and provide

an understanding of the theological concept of each religion with an attempt to build the understanding according to the preference of a religion and to avoid understanding matters subjectively;

(d) A dialogue in community: This dialogue is carried out by means of or in the form of cooperation between plural religious communities in capturing and resolving practical problems in daily life;

(e) The spiritual dialogue: This model of dialogue aims to develop and deepen the spiritual life among the various religions. The aforementioned models of dialogue are possible options in the effort of building harmonious life among religious people. The dialogue will develop a model of religious understanding which not only confirms the differences, but also finds common ground or similarities that exist between those religions. Interfaith dialogue is expected to deliver religious paradigm of "ritual piety" and "individual piety" to form "social piety".

(2) Establishment of tolerance among religious people. Religious harmony can only be realized when any community behave gracefully toward others. In addition, this behavior will have impact on the life and progress of the plural society, when manifested in:

(a) The attitude of self-control regarding the different teachings, beliefs, and habits of groups of other religion, which may be contrary to their own teachings, beliefs, and behaviors; the attitude of respecting the rights of others who solemnly adhere to the teaching of their religion; and the attitude of trusting the good faith of other religious communities;

(b) The actions which are realized in an attempt to understand the teachings and the beliefs of other religions; the attempt to express their own religious belief wisely without any mockery of other religions; the attempt to help each other in social activities to overcome the underdevelopment together;

(c) The effort to learn the strengths and advantages of others which results in exchange of experiences to achieve the common progress.

CONCLUSIONS

The stereotype of another community of different religions has been one of many causes that leads to religious conflict. Cases followed by attempts to attack, to kill, to burn worship places and valuable places of religious people have occurred everywhere on earth. In the recent decades, Stereotypes of Moslems which have been believed by different religious adherents are radical, intolerant, terrorist, fundamentalist and highly subjective attitudes in perceiving other truth of different religions. On the other hand, Christians are seen to be aggressive and ambitious people, who tend to conquer any aspect of human life. In this case, it takes wisdom of all parties to cut off the existing potential that beautiful Indonesia which is free of the prolonged religious conflicts may come into reality.

From the description above, it is proper to reaffirm that in order to settle the conflict between religions, dialogue is an option and is not something that is impossible. The word of "dialogue" is not necessarily a formal event or organized in the room. The more fundamental aspect of dialogue is that it is performed in the daily interaction, on television, in newspapers and books. The dialogue between religious communities will deliver and establish an inclusive theological point of view.

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Simulation of 2D Brain's Potential Distribution Based on Two Electrodes ECVT Using Finite Element Method

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Simulation of 2D Brain's Potential Distribution Based on Two Electrodes ECVT Using Finite Element Method

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Abstract. The aim of this study is to simulate the potential distribution of 2D brain geometry based on two electrodes ECVT. ECVT (electrical capacitance tomography) is a tomography modality which produces dielectric distribution image of a subject from several capacitance electrodes measurements. This study begins by producing the geometry of 2D brain based on MRI image and then setting the boundary conditions on the boundaries of the geometry. The values of boundary conditions follow the potential values used in two electrodes brain ECVT, and for this reason the first boundary is set to 20 volt and 2.5 MHz signal and another boundary is set to ground. Poisson equation is implemented as the governing equation in the 2D brain geometry and finite element method is used to solve the equation. Simulated Hodgkin-Huxley action potential is applied as disturbance potential in the geometry. We divide this study into two which comprises simulation without disturbance potential and simulation with disturbance potential. From this study, each of time dependent potential distributions from non-disturbance and disturbance potential of the 2D brain geometry has been generated.

1. Introduction

Brain is an important organ in the human body. The brain basically serves to regulate and coordinate most of the movement, behavior and homeostatic of body functions, such as heart, blood pressure, and body temperature. The human brain is responsible for setting the whole body and the way human think. Studying the brain is important so that human can improve their health quality. One method to learn the brain is to use tomography modality. As the brain is important for the body, a tomography modality for the brain should be safe, non-invasive, and accurate.

Recently, ECVT as a new tomography modality has been used in medical physics field to study human brain functions [1] and human brain activity [2]. ECVT (electrical capacitance volume tomography) is a tomography modality for direct volume imaging of permittivity distributions based on utilizing capacitance sensor. ECVT is a system developed based on ECT (electrical capacitance tomography) constructing the 2D permittivity distribution. In the beginning of its development, ECVT is used in industrial processes for dynamic flow imaging because of its capabilities to reconstruct image in real time, non-invasive, and non-destructive. ECVT system consists of three parts: (1) sensor, (2) data acquisition system, and (3) a computer system for reconstruction and viewing reconstructed images.

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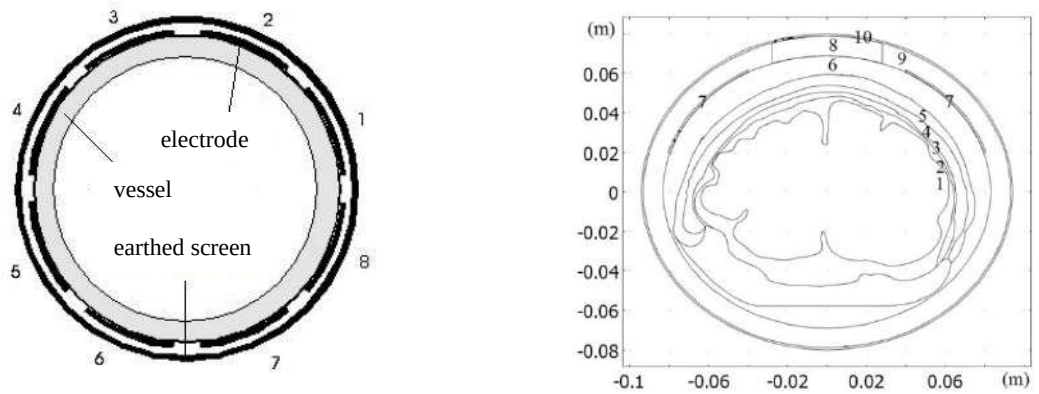
In general ECVT system has two problems: (1) forward problem, and (2) inverse problem to produce the final result [3]. Forward problem includes task of collecting capacitance data from sensors placed around the wall which could be studied either by a simulation or a direct measurements with capacitance sensors. Inverse problem includes task of reconstructing permittivity distributions image from the collected capacitance data. Studies in inverse problems, which are about image reconstruction using appropriate algorithms, have been commonly reported in industrial ECVT [3, 4] and in brain ECVT [1, 2] due to its similar principles. However, studies in forward problem specifically in brain ECVT are less known until now.

In this paper, we study forward problem of ECVT on 2D brain geometry by simulation using finite element method based on two brain ECVT electrodes. In ECVT, finite element method resolves the potential distribution in the domain, and then it calculates the capacitance values in it. However, to analyze the parameters which are changing the brain capacitance, we could study it from the potential distribution on the geometry. Therefore, in this paper we only study the potential distribution in geometry produced by finite element method.

2. Methodology

The methods of this study begin with designing two electrodes brain ECVT sensor. In general ECVT includes 8 or 32 electrodes sensor, but in this study we only use two sensors because two sensors is adequate for generating the brain potential distribution. Sensor design is based on the design of 2D ECT sensor (Electrical Capacitance Tomography) [5] shown in figure 1 (a). An ECT sensor consists of several electrodes mounted on outside of a vessel, and it is surrounded by a guard screen. The guard screen on the outer side of the sensor is set to ground to reduce the effects of external electric fields. Axial screens are mounted between electrodes to avoid the electric field from excitation electrode reaching detector electrode directly without being influenced by dielectric object in geometry.



(a) **(b)**

Figure 1. (a) Sensor design, (b) MRI based 2D coronal brain geometry and sensor

The 2D coronal brain geometry merged with sensor design is shown in figure 1 (b). The 2D brain's geometry structure is produced based on MRI image, and it is segmented into five tissue types following the simulation done by Miranda [6]. The brain is assumed has isotropic physical properties based on simulation by Miranda [6]. From inside to outside, the brain geometry consists of white matter, grey matter, CSF, skull, skin, and vessel with each of its relative permittivity at 2,5MHz are 308, 604, 109, 93, 799, and 3 respectively [7]. Two electrodes ($\varepsilon_r = 1$) with 5cm length and 5cm width showed in number seven on figure 1 (b) are positioned outside the vessel. From figure 1 (b), number seven on left side depicts excitation electrode, and number seven on right side depicts detector electrode. Number eight depicts axial screen, and number nine depicts air layer.

In real, brain ECVT applies electrical sinusoidal signal with 20 volt voltage and 2.5MHz frequency. For the governing equation in the geometry, Poisson equation is implemented, and

electrostatic approximation is chosen as described in ECT [8, 9, 10] and ECVT [3, 4]. This electrostatic approximation is chosen with assuming that there are no magnetic fields in domain so that $\nabla \times E = 0$. Because the domain length (≈0.2m) is tinier than the wave length (≈100m), there are no waves propagation happens. With assuming there are no free charges existed in brain geometry, the equation of the brain ECVT and the boundary condition become:

$$\nabla \cdot (\varepsilon \nabla V) = 0 \qquad (1)$$
$$V\big|_{\Gamma_i} = V \; ; \; V\big|_{\Gamma j} = 0$$

with V = 20sin(2π(2.5MHz)t) volt. Both Γ_i and Γ_j are boundary condition for excitation electrode and detection electrode respectively. In this study time interval is 1x10^{-7}s.

As potential disturbance, simulated Hodgkin-Huxley action potential is applied. Simulated Hodgkin-Huxley action potential is shown in figure 2. We put this potential at (0, 2.3) in brain layer with assuming that there are electrical activities in white matter.

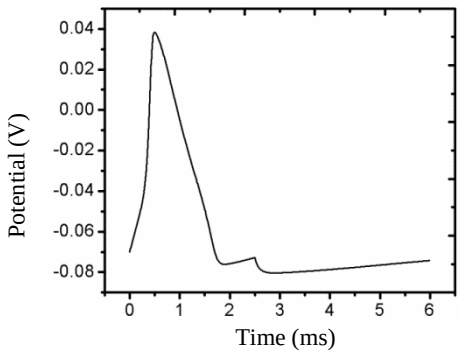


Figure 2. Simulated Hodgkin-Huxley Action Potential

The forward problem in ECVT is the problem of calculating the potential distribution with solving the implemented governing equation. After that, it calculates the capacitance value on the geometry using the potential distribution which already known. Finite element method works with discretizing the geometry into small elements such as triangle, or tetrahedral. These elements contain nodes and edges. For solving the governing equation, finite element changes the differential equation into weak form. So the equation 1 in 2D becomes:

$$-\int_{\Omega} \nabla w \cdot \mathbf{D}\, dA = -\oint_{\Gamma} w \mathbf{D} \cdot \mathbf{n}\, dl \qquad (2)$$

with w is weighted residual and **D** is electric displacement.

3. Results and Discussion

These simulations use coronal slice of brain consisting of five layers. Domain is discretized using triangle elements. Based on figure 3, the domain has been successfully discretized and has 25297 elements.

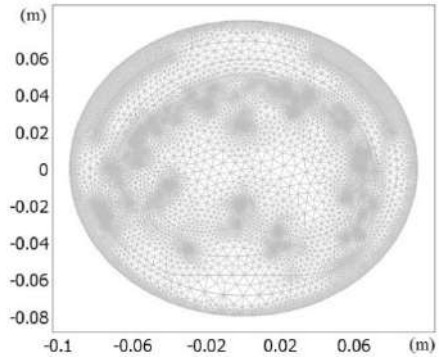
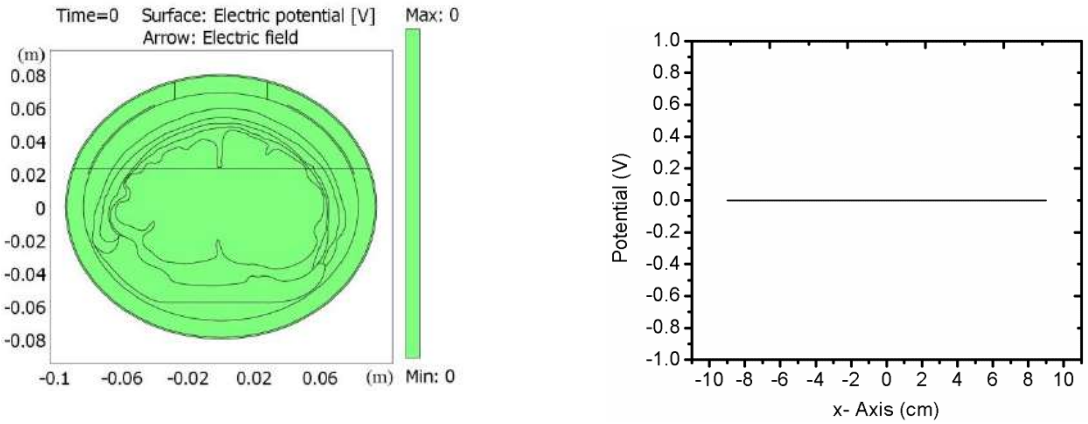


Figure 3. Discretization of the geometry

The potential distributions are divided into two parts, i.e., without disturbance potential and with disturbance potential. We put profile picture to each of potential distributions image to simplify the potential inspection. In profile picture, the excitation electrode is laid around -8cm in x-axis, the detector electrode is laid around 8cm in x-axis, and brain layer is laid from -6cm to 6cm in x-axis. The disturbance potential is located in 0cm in x-axis and 2.3 in y-axis. The time dependent potential distributions are divided into four parts i.e. at 0s, $1x10^{-7}$s, $2x10^{-7s}$, and $3x10^{-7}$s for one cycle sinusoidal signal with 2.5MHz frequency.

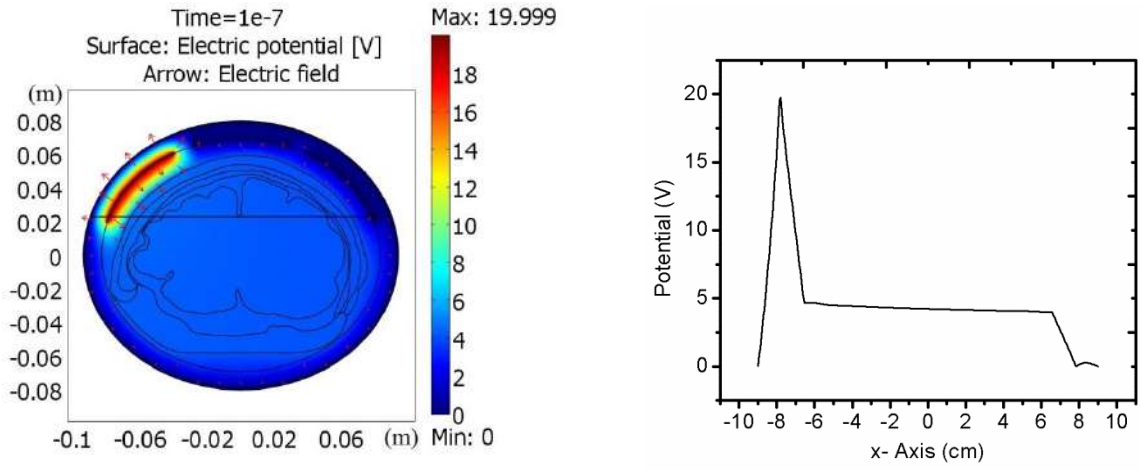
3.1. Without disturbance potential



(a) **(b)**

Figure 4. (a) Potential distribution without disturbance at t = 0s,
(b) Profile of potential distribution

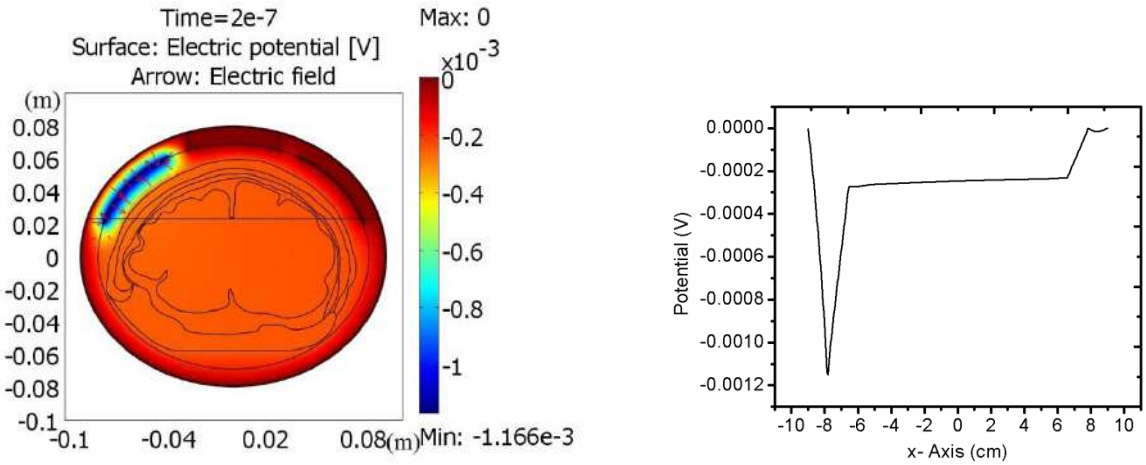
Figure 4 (a) is potential distribution without potential disturbance at 0s. Figure 4 (b) is profile of potential distribution in figure 4 (a). At this time, the signal excitation is still 0 volt. From figure 4 (b), it is clear that the whole geometry is still around 0 volt because there is no potential in excitation electrode at this time.



(a) **(b)**

Figure 5. (a) Potential distribution without disturbance at t = $1x10^{-7}$s,
(b) Profile of potential distribution

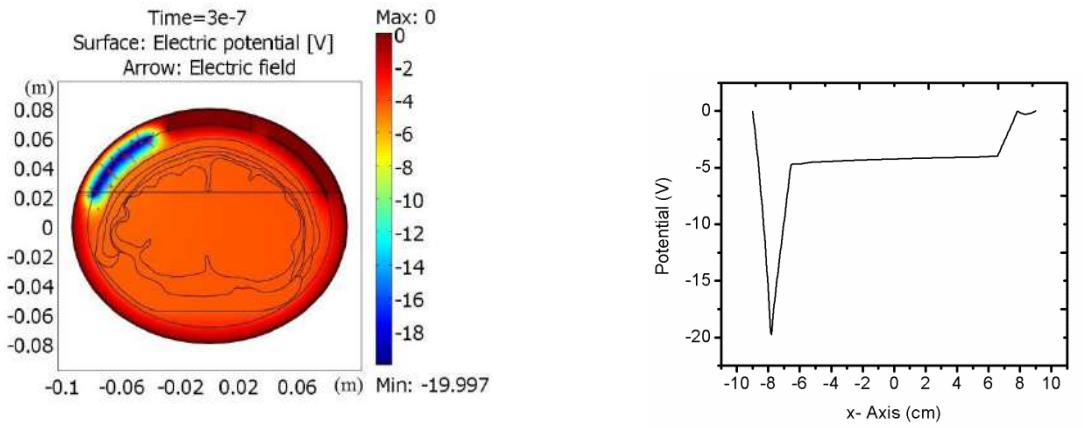
Figure 5 (a) is potential distribution in geometry at $1x10^{-7}$s. At this time, the signal excitation reaches 20 volt. Figure 5 (b) shows that the potential around excitation electrode is about 20 volt, and the potential around detector electrode is about 0 volt. There is a sharp decrease in potential distribution between excitation electrode position and brain layer position from around 20 volt to under 5 volt before remaining stable in the brain layers, and then it declines significantly to around 0 volt in detection electrode.



(a) **(b)**

Figure 6. (a) Potential distribution without disturbance at t = $2x10^{-7}$s,
(b) Profile of potential distribution

Figure 6 (a) is potential distribution in geometry at $2x10^{-7}$s. At this time, the signal excitation backs to about 0 volt. Figure 6 (b) shows that the potential around excitation electrode is about -0.0012 volt which is tiny, and the potential around detector electrode is about 0 volt. The pattern is similar to potential distribution at $1x10^{-7}$s, but it has smaller amount and the sign oppose each other.

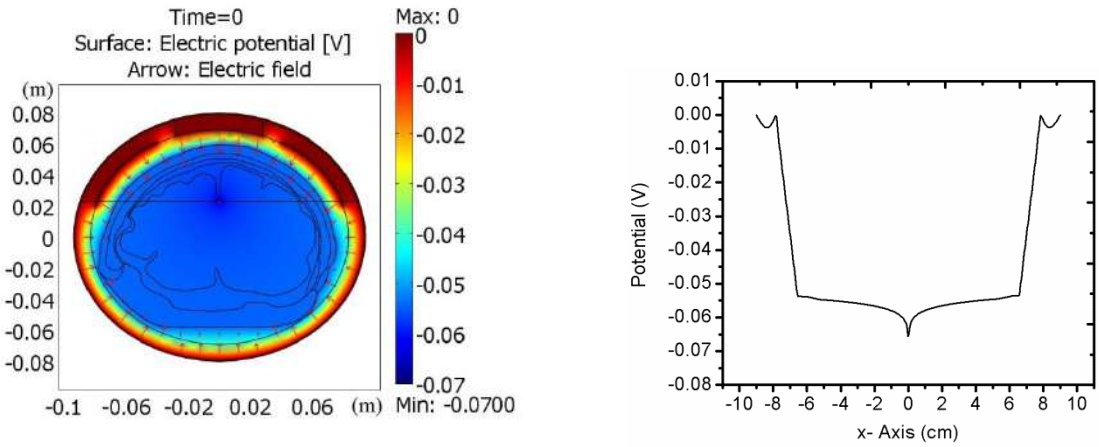


(a) **(b)**

Figure 7. (a) Potential distribution without disturbance at t = $3x10^{-7}$s,
(b) Profile of potential distribution

Figure 7 (a) is potential distribution in geometry at $3x10^{-7}$s. At this time, the signal excitation reaches -20 volt. Figure 7 (b) shows that the potential around excitation electrode is about -20 volt, and the potential around detector electrode is about 0 volt. This result is similar to result at t = $1x10^{-7}$s except its sign oppose each other.

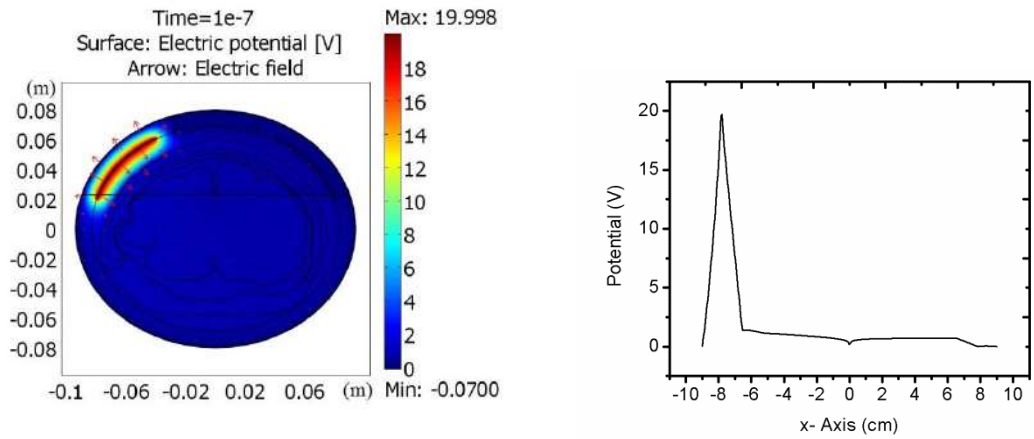
3.2. With disturbance potential



(a) **(b)**

Figure 8. (a) Potential distribution with disturbance at t = 0s,
(b) Profile of potential distribution

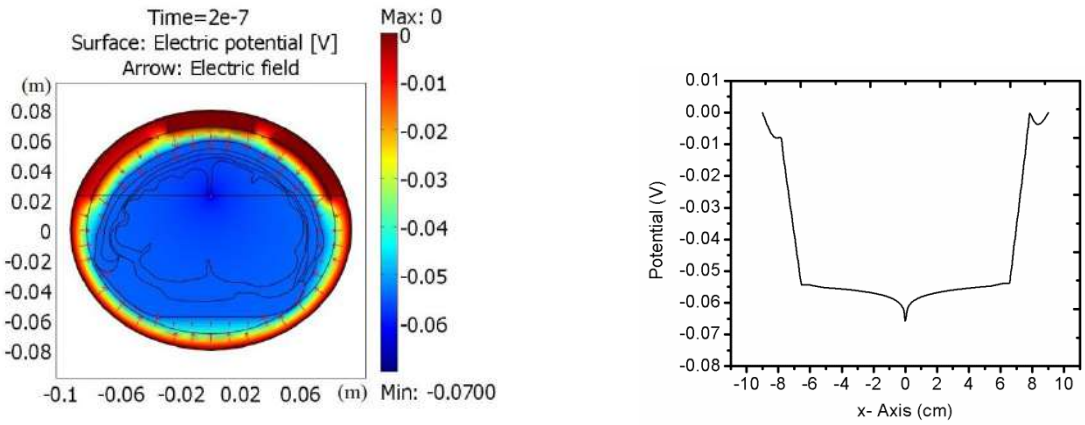
Figure 8 (a) is picture for potential distribution with simulated hodgkin-huxley action potential applied as potential disturbance on the brain geometry. From figure 8 (a), we can see the position of disturbance potential is at (0, 2.3) as a black color point. At this time, the signal excitation is still zero volt. Figure 8 (b) shows that the potential around excitation electrode and detector electrode are about 0 volt. Potential in brain layer is around -0.05 volt, and it decreases slightly to about -0.07 volt at disturbance potential position.



(a) **(b)**

Figure 9. (a) Potential distribution with disturbance at t = 1x10^{-7}s, (b) Profile of potential distribution

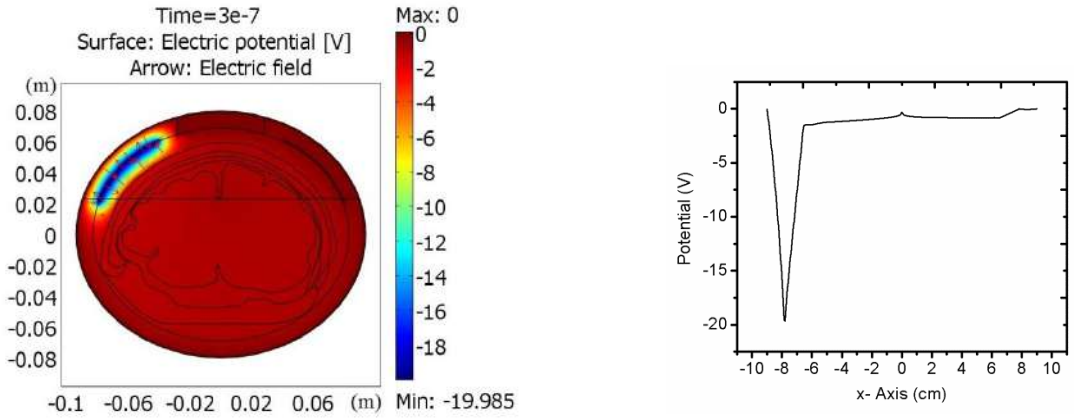
Figure 9 (a) is potential distribution in geometry at 1x10^{-7}s. At this time, the signal excitation reaches 20 volt. Figure 9 (b) shows that the potential around excitation electrode is about 20 volt, and potential around detector electrode is about 0 volt. There is a dramatic decline in the potential distribution between excitation electrode position and brain layer position from about 20 volt to approximately 2 volt. Potential in brain layer is about 2 volt and decreasing significantly to -0.07 volt at 0cm in x-axis where the disturbance potential located. After that, the potential remains stable until it reaches the end of brain layer. The potential backs to 0 volt in detection electrode.



(a) **(b)**

Figure 10. (a) Potential distribution with disturbance at t = 2x10^{-7}s, (b) Profile of potential distribution

Figure 10 (a) is potential distribution in geometry at 2x10^{-7}s. At this time, the signal excitation backs to 0 volt. Figure 10 (b) shows that the potential around excitation electrode is just under -0.01 volt, and the potential around detector electrode is about 0 volt. This potential in brain layer is around -0.055 volt, and it fall slightly to about -0.07 volt at disturbance potential source.



(a) **(b)**

Figure 11. (a) Potential distribution with disturbance at t = $3x10^{-7}$s,
(b) Profile of potential distribution

Figure 11 (a) is potential distribution in geometry at $3x10^{-7}$s. At this time, the signal excitation reaches -20 volt. Figure 11 (b) shows that the potential around excitation electrode is about -20 volt, and potential around detector electrode is about 0 volt. This simulated result looks similar to figure 9. The only difference is the sign oppose each other.

4. Conclusion

In this paper, after solving the governing equation by using finite element method, time dependent potential distribution from non-disturbance potential and disturbance potential of the 2D brain geometry has been generated. There is always a dramatic decrease in the amount of potential distribution at $1x10^{-7}$s and $3x10^{-7}$s between excitation electrode position and brain layer position in both without disturbance potential and with disturbance potential. However, the physical meaning of these figures needs to be analyzed deeply. In conclusion, there is a noticeable difference between the potential distribution with disturbance and the potential distribution without disturbance.

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Research Article

TECHNOLOGICAL PROGRESS AND ECONOMIC GROWTH IN INDONESIA: A REGIONAL PERSPECTIVE

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ABSTRACT

This paper examined the relationship between technological progress, measured by TFP growth, and economic growth, measured by GDP growth, both at national and regional levels experienced by Indonesia. Spatially, Indonesia was disaggregated into 6 groups of Island: Sumatera, Java, Kalimantan, Sulawesi, Bali-Nusa Tenggara dan Maluku-Papua. Coefficients of correlation were calculated using simple regression model. Data resulted from a study at the Agency for the Assessment and Application of Technology of the Government of Indonesia, 1984-2010, were used for this study. The results showed that both at national level as well as at regional level the correlation between technological progress and economic growth was positive and very strong. It is then suggested that programs of technology development should continually be pushed in order to maintain sustainable economic growth.

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INTRODUCTION

Economic growth, by definition, is the increase in the inflation-adjusted market value of the goods and services produced by an economy over time. It is conventionally measured as the percent rate of increase in real gross domestic product (real GDP), usually in per capita terms (IMF, 2012). Growth is usually calculated in real terms to eliminate the distorting effect of inflation on the price of goods produced. Since economic growth is measured as the annual percent change of gross domestic product (GDP), it has all the advantages and drawbacks of that measure. The rate of economic growth refers to the geometric annual rate of growth in GDP between the first and the last year over a period of time. Implicitly, this growth rate is the trend in the average level of GDP over the period, which implicitly ignores the fluctuations in the GDP around this trend. An increase in economic growth caused by more efficient use of inputs is referred to as intensive growth. GDP growth caused only by increases in the amount of inputs available for use is called extensive growth.

Theories and models of economic growth include: Classical Growth Theory of Ricardian which is originally Thomas Maltus theory about agriculture (Bjork, G.J., 1999), Solow-Swan Model developed by Sollow, R., (1956) and Swan, T., (1956), Endogenous Growth Theory which focus on what increases human capital or technological change (Helpman, E., 2004), Unified Growth Theory developed by Galor, O., (2005), The Big Push Theory which is popular in 1940s, Schumpeterian Growth Theory which is entrepreneurs introduce new products or processes in the hope that they will enjoy temporary monopoly-like profits as they capture markets (Aghion, P., 2002), Institutions and Growth Theory (Acemoglu, at al., 2001), Human Capital and Growth Theory (Barro & Lee, 2001), and Energy Consumption and Growth Theory (Committee on Electricity in Economic Growth Energy Engineering, 1986).

Historically, technology has played a central role in raising living standards across the region. The Green Revolution and various innovations of modern medicine and public health have been instrumental in improving nutrition, health, and livelihoods of millions of poor people. Agricultural and medical biotechnology hold tremendous promise but also bring with them new risks and concerns that need to be addressed before their full potential can be realized. New information technologies are only beginning to diffuse widely in developing Asia and the Pacific, but ultimately these too can have profound impacts on the lives of the poor, empowering them with access to information that once was the preserve of the privileged few (OECD,2002).

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Advances in science and technology have continuously accounted for most of the growth and wealth accumulation in leading industrialized economies. In recent years, the contribution of technological progress to growth and welfare improvement has increased even further, especially with the globalization process which has been characterized by exponential growth in exports of manufactured goods. (Hippolyte, F., 2008) shows that the widening income and welfare gap between Sub-Saharan Africa and the rest of world is largely accounted for by the technology trap responsible for the poverty trap.

Technological progress, technological development, technological achievement, or technological change is the overall process of invention, innovation and diffusion of technology or processes. In essence technological progress is the invention of technologies and their commercialization via research and development, the continual improvement of technologies, and the diffusion of technologies throughout industry or society. In short, technological progress is based on both better and more technology. In economics, change in a production function that alters the relationship between inputs and outputs. Normally it is understood to be an improvement in technology, or technological progress. Technological change is a change in the set of feasible production possibilities (Hicks,J.R.,1963). Total factor productivity is used to measure technological progress (Crespo, R.J., 2005). Study on total factor productivity for Indonesia was intensively conducted by Sigit, Hananto (2004); Socia Prihawantoro, et al, (2009; 2013).

Technological progress and economic growth are truly related to each other. The level of technology is also an important determinant of economic growth. The rapid rate of growth can be achieved through high level of technology. The technological progress keeps the economy moving. Inventions and innovations have been largely responsible for rapid economic growth in developed countries. It has been observed that major part of increased productivity is due to technological progress. Technological progress is one of the most important determinants of the shape and evolution of the economy. Boskin & Lau (1992) indicated that in developed countries, technological progress contributed about 49 to 76 per cent on economic growth. According to Solow (1957) the contribution of technological progress on American economic growth was 87.5 per cent.

Technological progress has improved working conditions, permitted the reduction of working hours and provided the increased flow of products. The technology can be regarded as primary source in economic development and the various technological progress contribute significantly in the development of underdeveloped countries. The contribution of technical progress to economic development among others, that technical progress leads to the growth of output and productivity. As a result, per capita income is increased. On the one hand, consumption of the household rises, while, entrepreneurs start saving, generating more and more surplus. They are encouraged to make more and more investment in the economy. It helps to generate capital formation and the rate of growth automatically increases.

Objective of this paper is to examine empirically the correlation between technological progress on economic growth for Indonesia both at national level as well as at regional level.

METHODS

Simple regression analysis was employed to calculate correlation coefficients between technological progress and economic growth. Economic growth was measured by the growth of gross domestic products (GDP) and technological progress was measured by total factor productivity (TFP) growth.

The OECD defines GDP as "an aggregate measure of production equal to the sum of the gross values added of all resident and institutional units engaged in production, plus any taxes, and minus any subsidies, on products not included in the value of their outputs"(IMF, 2014). An IMF (2016) publication states that "GDP measures the monetary value of final goods and services - that is, those that are bought by the final user - produced in a country in a given period of time, for instance for a year". The modern concept of GDP was first developed by Simon Kuznets for a US Congress report in 1934 (Kuznets, S., 1934). In this report, Kuznets warned against its use as a measure of welfare. After the Bretton Woods conference in 1944, GDP became the main tool for measuring a country's economy (Dickinson, E., 2012). GDP can be determined in three ways, all of which should, in principle, give the same result. They are the production or output or value added approach, the income approach, or the expenditure approach. The most direct of the three is the production approach, which sums the outputs of every class of enterprise to arrive at the total. The expenditure approach works on the principle that all of the product must be bought by somebody, therefore the value of the total product must be equal to people's total expenditures in buying things. The income approach works on the principle that the incomes of the productive factors must be equal to the value of their product, and determines GDP by finding the sum of all producers' incomes (World Bank, 2009).

Growiec, J., (2009) proposed four alternative methods for computing technological progress, sorted according to increasing methodological sophistication, namely: 1.TFP growth rate from a Cobb–Douglas production function, computed using only physical capital and labour as inputs, 2. Potential TFP growth rate from a Cobb–Douglas production function, computed using either only physical capital and labour as input, 3. Rate of technological progress at the world technology frontier (WTF), computed from a production function constructed with the non-parametric DEA algorithm, and 4. The Malmquist productivity index, computed from a production function constructed with the non-parametric DEA algorithm.

Data of TFP growth and economic growth from the year 1984 to 2010 collected from the results of a research report published by the Agency for Assessment and Application of Technology (Socia Prihawantoro, et. al., 2009; 2013).

Regression analysis was used to calculate the correlation coefficients, coefficients determination, regression coefficients and their significant level. Easy and user friendly software of MS-Excel was used to calculate those coefficients, where y = economic growth (GDP growth) and x = technological progress (TFP growth).

RESULTS AND DISCUSSION

Figure 1(left panel) provides picture of Indonesian regional GDP growth. The islands of Maluku-Papua had the highest economic growth, followed by Sulawesi, Bali Nusa Tenggara, Kalimantan, Java and Sumatera. National economy during 1984-2010 grows at average 5.6 per cent per year. The highest growth was 8.89 per cent at the year 2000, two years after multi-dimension economic crisis in 1998 and 1999. In 1998-1999, Indonesian economic growth was negative, -6.95% and -1.86%.

At regional level, as a whole, the highest economic growth was in the Island of Maluku-Papua, followed by Sulawesi Island, Bali- Nusa Tenggara Islands, Kalimantan Island, Java Island and Sumatera Island. On Average, the highest economic growth was at Sulawesi Island (6.48%), followed by the Island of Bali-Nusa Tenggara (6.19%), Java Island (5.35%), Kalimantan Island (5.31%), Maluku-Papua Island (5.23%) and Sumatera Island (5.05%).

Island, followed by Maluku-Papua Island, Kalimantan Island, Bali-Nusa Tenggara Island, Java Island and Sumatra Island. In average, the growth of TFP in national economy was 0.05 per cent, about 10 per cent of national economic growth. The highest TFP growth was 6.68 per cent in the year of 2000. The lowest TFP growth, -9.67 per cent, was in the year of 1998 when monetary crisis experienced by Indonesia. Many negative TFP growths were in the year of 1985 (-3.68%), 1986 (-0.43%), 1987 (-0.83%), 1988 (-0.10%), 1991 (-0.01%), 1993(-0.52%), 1997(-0.81%), 1998(-9.67%), 1999(-6.29%), and 2006 (-0.02%).

Figure 2 (right panel) presents scatter diagram between technological progress and economic growth at national level. The trend was linier, as technological progress increase, and then the economic will also increase. In Figure 2 (left panel) the TFP growth line was below the economic growth line, except in year of financial crisis, year 1998 and 1999.

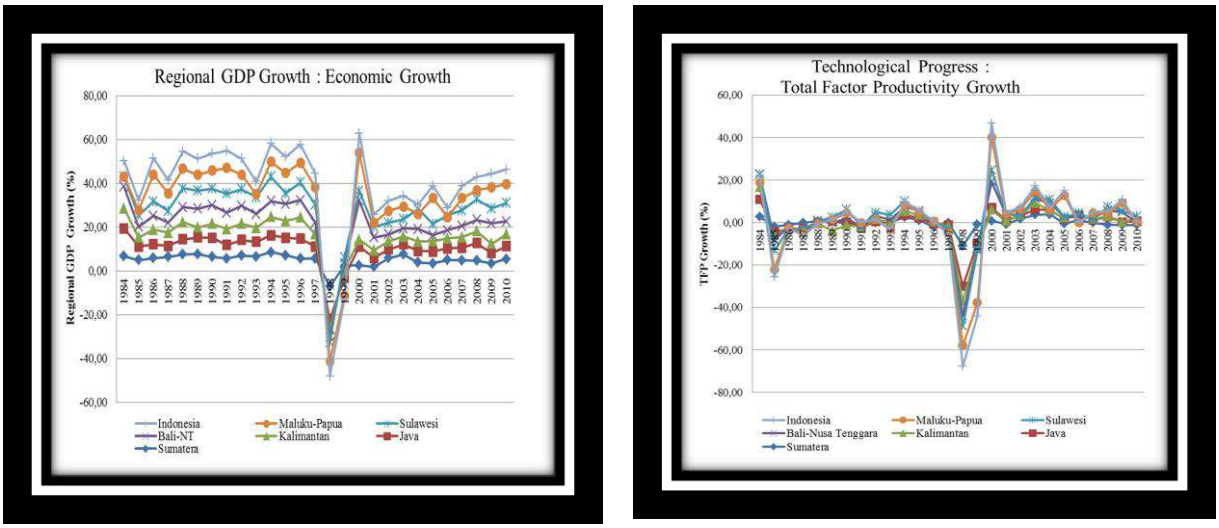

Figure 1: Regional Economic Growth (left) and Regional TFP Growth (right), Indonesia 1984-2010.

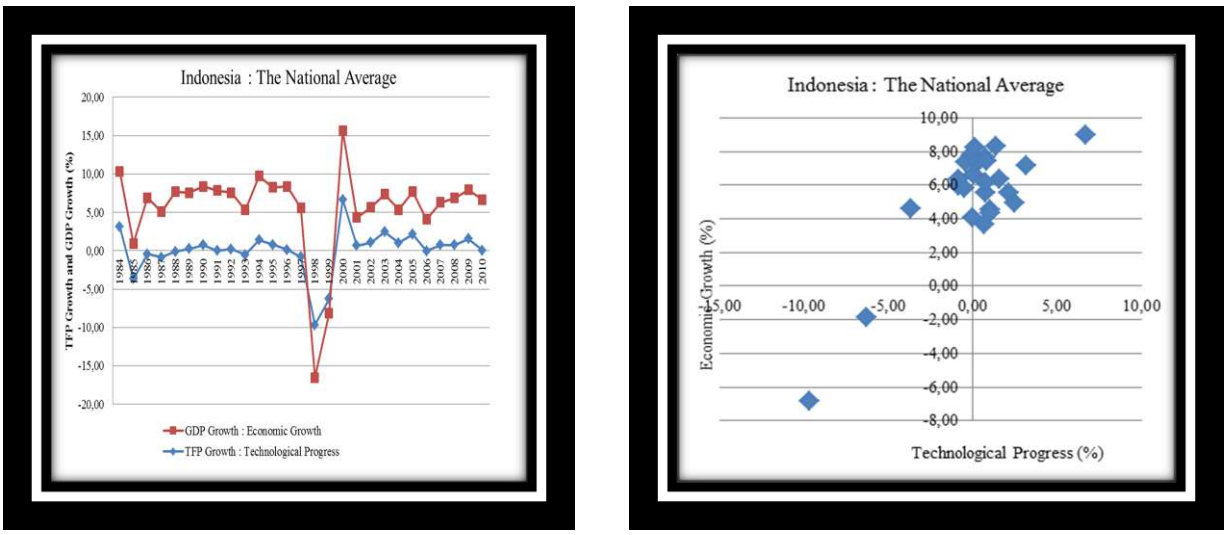

Figure 2: Technological Progress and Economic Growth: National Level, Indonesia

In Figure 1(right panel) the growth of total factor productivity, a measurement of technological progress, was presented. As a whole, the highest total factor productivy was at Sulawesi

The same trend was also shown by Figure 3 (left panel) where TFP growth line for Sumatera Island was lower than Sumatra's economic growth line, except for the year of 1998. The trend was also linier as scatter diagram indicated (right panel).

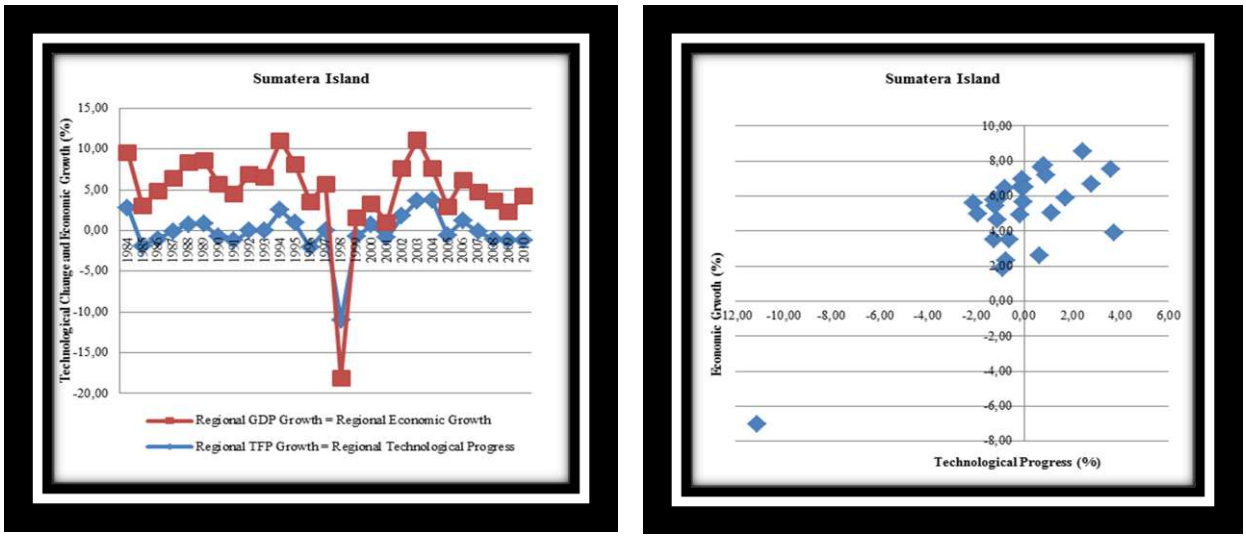

Figure 3: Technological Progress and Economic Growth: Regional Level, Sumatera Island

Again, in the Island of Java, the trend between technological progress and economic growth was also linier as indicated by the scatter diagram at Figure 4 (right panel). The pattern of correlation between technological progress and economic growth in Java Island was similar with that at Sumatra Island (Figure 4, left panel).

In Kalimantan Island, TFP growth line was also located below the economic growth lines, except for the year 1998 (Figure 5, left panel). In Figure 5 (right panel), the trend between technological progress and economic growth at Kalimantan Island was still linier, even though the scatter diagram a bit more spread.

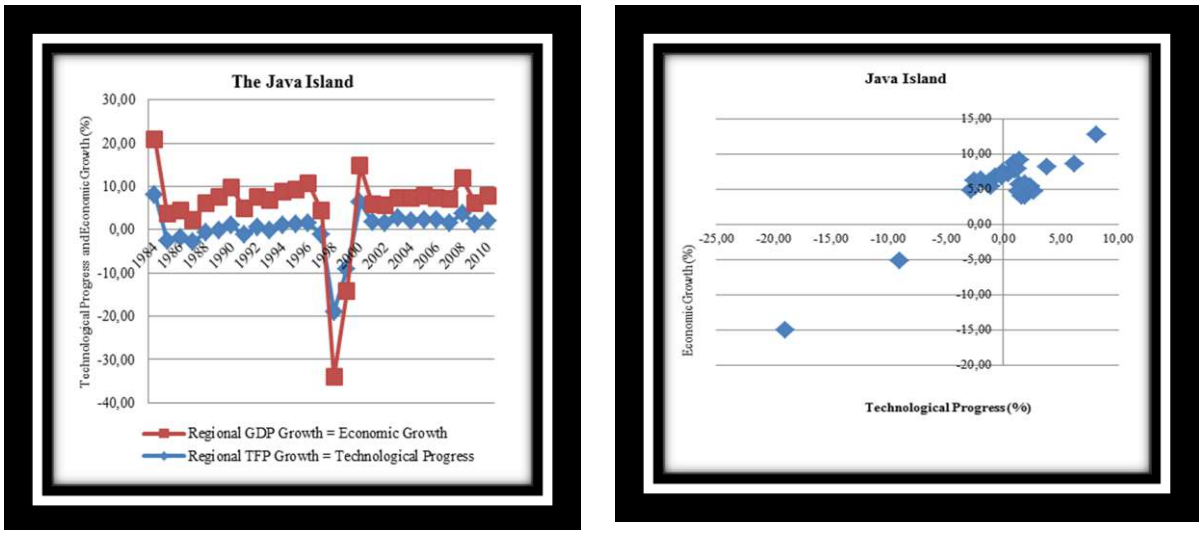

Figure 4: Technological Progress and Economic Growth: Regional Level, Java Island

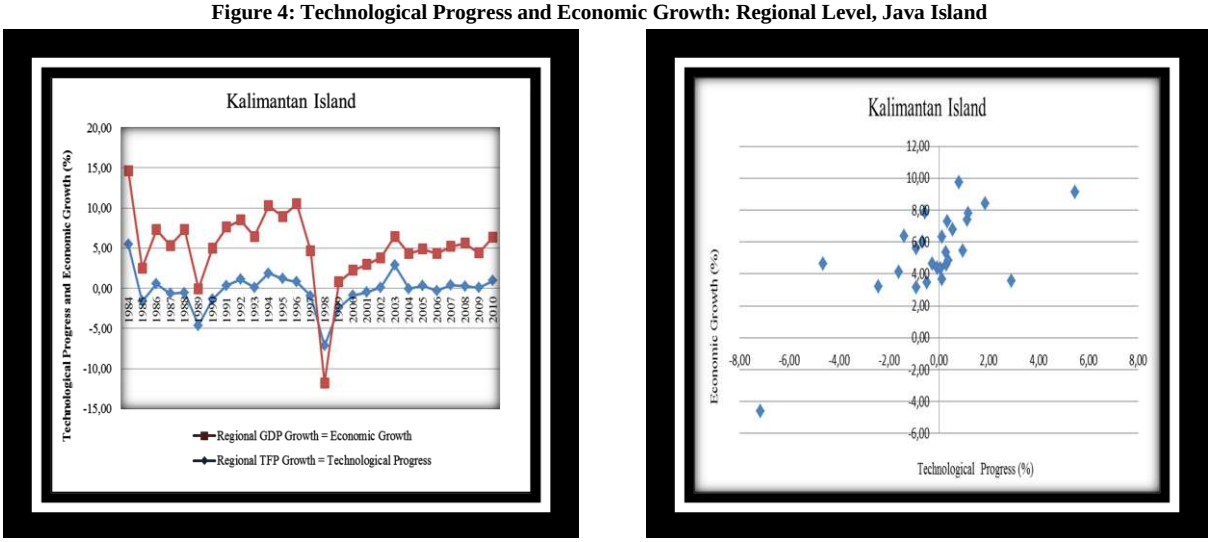

Figure 5: Technological Progress and Economic Growth: Regional Level, Kalimantan Island

Figure 6 presents the trend of correlation between technological progress and economic growth at the Island of Bali-Nusa Tenggara. The line of economic growth was above that of TFP growth, except at the year when financial crisis was experienced. The trend between technological change and economic growth was also similar with those at Sumatera Island, Java Island and Kalimantan Island.

Figure 7 presents the trend between technological progress and economic growth at the Island of Sulawesi. Similar with the other island, the TFP growth line was located below the line of economic growth. The trend of correlation between technological progress and economic growth in Sulawesi Island was positive and linier as indicated in Figure 7 (right panel).

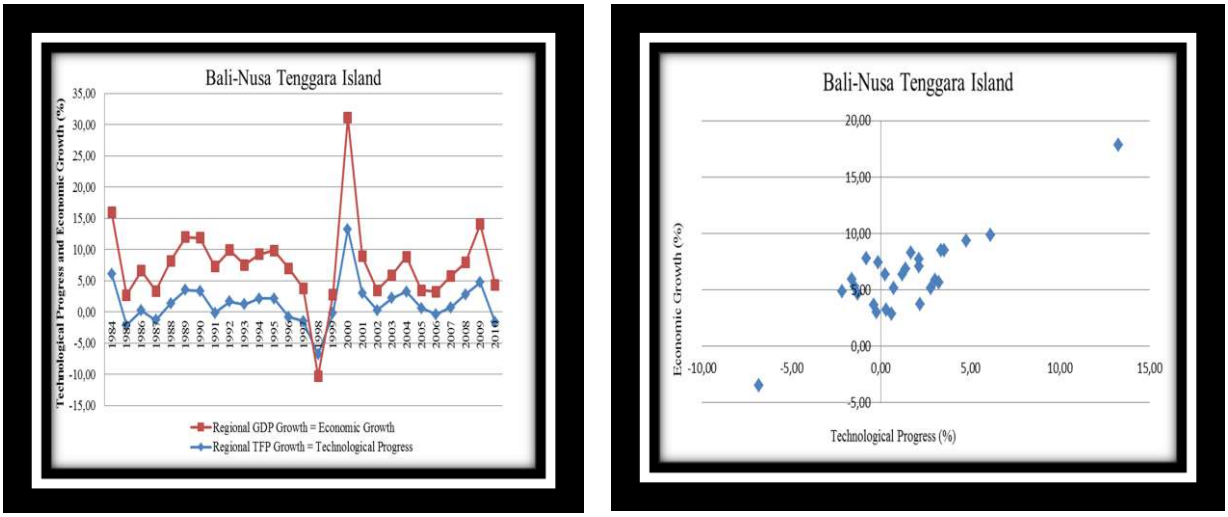

Figure 6: Technological Progress and Economic Growth: Regional Level, Bali-Nusa Tenggara Island

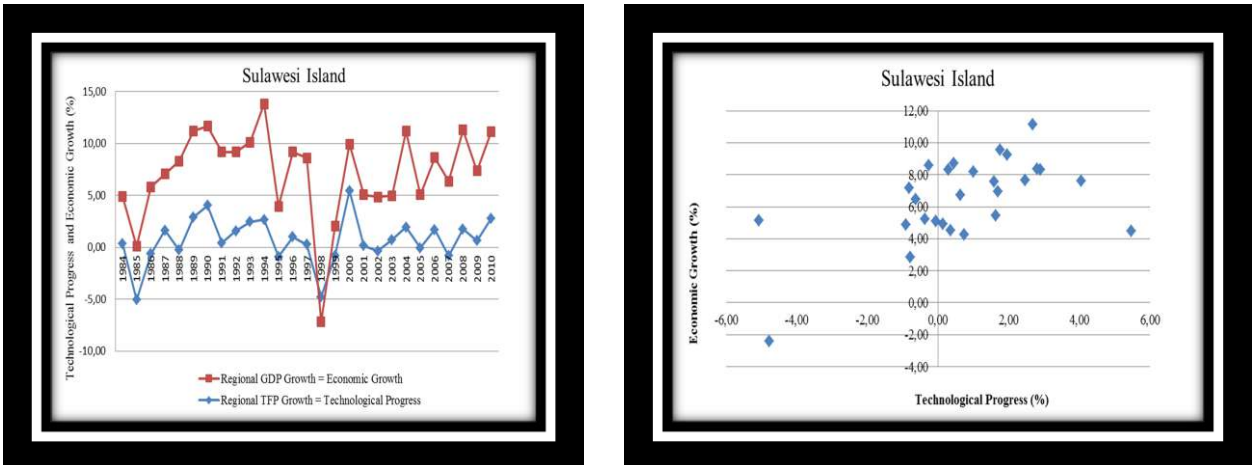

Figure 7: Technological Progress and Economic Growth: Regional Level, Sulawesi Island

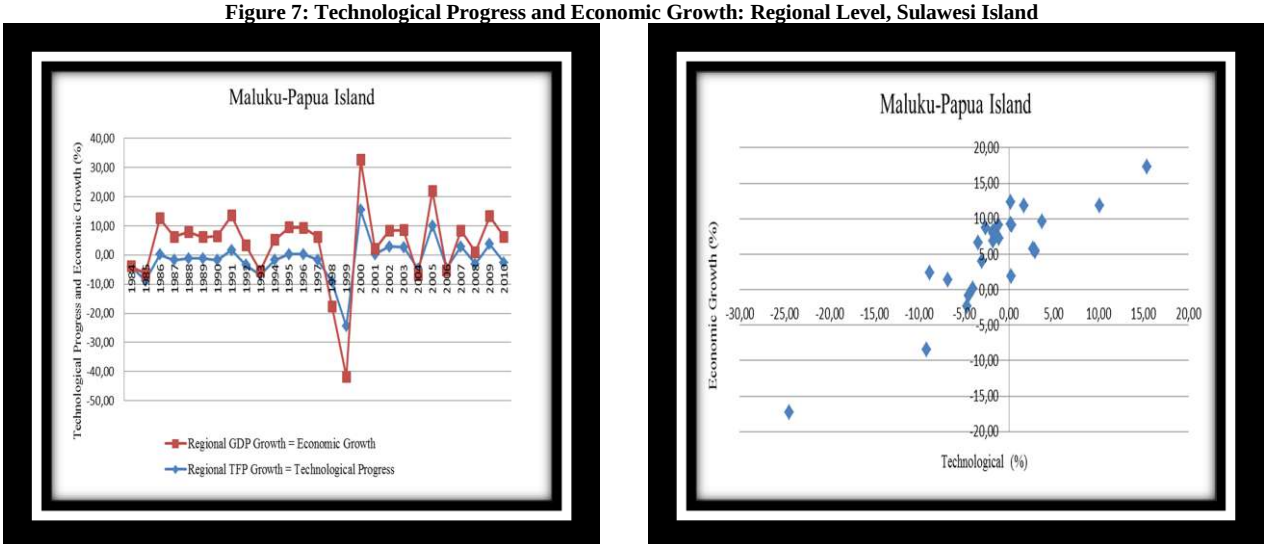

Figure 8: Technological Progress and Economic Growth: Regional Level, Maluku-Papua Island

Finally, Figure 8 (right panel) presents scatter diagram between technological progress and economic growth at national level. The trend was linier, as technological progress increase, and then the economic will also increase. In Figure 8 (left panel) the TFP growth line was below the economic growth line, except in year of financial crisis, year 1998 and 1999.

Table 1 Results of Regression Analysis: Technological Progress on Economic Growth

	Indonesia	Sumatera	Java	Kalimantan	Bali-Nusa Tenggara	Sulawesi	Maluku Papua
R	0.81	0.78	0.90	0.71	0.86	0.55	0.86
R-Square	0.65	0.61	0.81	0.50	0.74	0.30	0.74
F	46.12	38.81	108.74	25.05	71.10	10.82	71.07
Significant	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Intercept	-3.99	-3.76	-4.60	-3.29	-3.83	-2.32	-5.98
t-Intercept	-5.82	-5.71	-7.50	-4.72	-5.40	-2.35	-6.89
X Var1	0.72	0.71	0.88	0.59	0.84	0.47	0.85
t-X Var1	6.79	6.23	10.43	5.01	8.43	3.29	8.43
P-value	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Table 1 provides the results of regression analysis between technological progress and economic growth in Indonesian economy, both at national and regional level. At the national level, coefficient of correlation between technological progress and economic growth was 0.81. It was a positive and very strong relation. The coefficient of determination, R-square, was 0.65. It means that at national level, 65 per cent of economic growth variations can be explained by technological progress. Other 35 per cent was the responsible of other factors. Regression analysis showed that the intercept between technological progress on economic growth was -3.99, means that if the growth of technological progress is zero per cent, then the economic growth would be negative, -3.99 per cent. Statistically this intercept coefficient was significant, indicated by the value of t-statistic. The slope of regression or the regression coefficient was 0.72, means that 1 per cent increase in the growth of technological progress would increase economic growth of 0.72 per cent. Regression analysis indicated that the regression coefficient was statistically significant.

At the regional level, coefficient of correlation between technological progress and economic growth varies where in the Java Island the coefficient was the highest (0.90) and in the Sulawesi Island the coefficient was the lowest (0.55). The coefficient of determination, R-square, was also follow the pattern, the highest was in the Island of Java (0.81) and the lowest was in the Sulawesi Island (0.30). It means that in the Java Island, 81 per cent of economic growth variations can be explained by technological progress. Another 19 per cent was the responsible of other factors. Meanwhile in the Sulawesi Island, only 30 percent of economic behavior can be explained by technological progress. Another 70 per cent was the responsible of other factors in economic growth. Regression analysis showed that the intercept between technological progresses on economic growth at regional levels varies, even though they all had negative value. These mean that when the growth of technical progress was zero, the value of economic growth would be negative. Statistically these intercept coefficients were significant, indicated by the value of t-statistic. The slopes of regression or the regression coefficients at regional level also vary among the Island where the Island of Java had the highest regression coefficient (0.88) and the Sulawesi Island has the smallest coefficient (0.47). In Java Island, 1 per cent increase in the growth of technological progress would increase economic growth of 0.88 per cent. In the Sulawesi Island, 1 per cent increase in technological progress would increase economic growth of 0.47 per cent. Regression analysis indicated that all the regression coefficients were statistically significant.

CONCLUSIONS

It could be concluded that technological progress had significant contribution on Indonesian economic growth, both at national as well as at regional levels.

The correlation coefficients between technological progress and economic growth indicate the strength relation between the two. At national level, the relationship between technological progress and economic growth was positive and very strong (0.81). At regional level, the stronger correlation between technological progress and economic growth happened in the Java Island (0.90) and at the Sulawesi Island the strength correlation coefficient between technological progress and economic growth was categorised as moderate (0.55).

The coefficients of determination explain the variations of economic growth due to the growth of technological progress. At the national level, the highest coefficient existed in the Java Island (0.81) and the lowest existed in the Island of Sulawesi.

Finally, the regression coefficients or the slope of regression line between technological progress and economic growth both at national and regional levels were positive and statistically significant. At national level, the coefficient of regression was 0.72. At regional levels, the coefficients of regression vary. The highest regression coefficient was in the Island of Java (0.88) and the smallest coefficient of regression was in the Sulawesi Island (0.47).

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THE EFFECT OF FORMATIVE EVALUATION AND COGNITIVE STYLE TOWARD LEARNING ACHIVEMENT

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Abstract.*This experimental investigated the efffect of formative evaluation (in form of multiple choices and essay test) and cognitive styles (field dependent and field independent) toward learning achievement of Citizen Education subject. The target population consisted of 275 students of seventh graders of Junior Secondary School 193 and 309 students of Junior Secondary School 256 in academic-year 2013/2014. Using multistage random sampling, the research obtained 11 students with high learning achievement and 11 students with low learning achievement who were placed at the experimental and control groups. Two-ways variant analysis (ANAVA) with 2 x 2 factorial design was applied to analyze data. The result of the research revealed that: (1) Civic Education learning achievement of students who did essay test is better that the achievement of those doing multiple-choice test; (2) Civic Education learning achievement of field independent students is better than the achievement of field dependent students; (3) there is interaction between formative evaluation and cognitive style toward Civic Education learning achievement; (4) Civic Education learning achievement of field independent students doing essay test is better than the achievement of those doing multiple-choice test; (5) Civic Education learning achievement of field dependent students doing essay test is smaller than those doing multiple-choice test; (6) Field independent students get better score in doing essay test than field dependent students in Civic Education subject learning achievement; (7) in terms of multiple-choice question, field independent student get smaller score than field dependent students.*

Keywords: *cognitive style, essay, multiple choice, learning achievement*

Introduction

The glory of a nation is determined by not only its abundant natural resources but also its quality of human resources. In order to achieve qualified human resources, schools are considered as a potential social institution. The regulation of the Republic of Indonesia Number 20 Year 2003 regarding National Education System states that national education aims to develop the potential of learners to make them religious, noble, knowledgeable, skillful, creative, and make them to be a democratic and responsible citizen.[1] In relation to the statement Civic Education subject, which is taught for all level of education in this country, aims to increase students' learning creativity in order to produce citizens who are religious, intelligent, democratic, peaceful, prosperous, and modern. [2]

Learning is one of factors which determines whether the graduates of education system are good or bad. [3] It can be assumed as the heart of education. Therefore, good learning could produce good graduates and vice versa. Learning is a system whose components are a synergy as a unit. Learning components include learners, teachers, materials, facilities & infrastructure, evaluation system, and environment. [4] Every teacher should master those components and apply them in learning processes.

In learning, there have been various methods and strategies implemented by teachers, and students can actively participate in learning processes using teaching techniques they are interested in. However, most students still do not know the best way for them to learn.

Students' inability to achieve learning objectives has an effect upon low quality of education.[5] One of the indicators showing this is the unsatisfying score of Civic Education suject subject for Final Semester Exam (FSA) at 193 and 256 State Junior Secondary Schools (SJSS), as can be seen in the table below:

Table 1.Mean of FSA for Civic Education subject
at 193 and 256 State Junior Secondary Schools, Cakung Subdistrict, East Jakarta

No.	Year	MAC 193 SJSS	FSA Score 193 SJSS	MAC 256 SJSS	FSA Score 256 SJSS
1	2007	6,5	6,15	6,5	5,58
2	2008	6,8	6,23	7,0	6,04
3	2009	7,0	6,58	7,2	6,25
4	2010	7,4	6,87	7,5	6,67
5	2011	7,5	7,37	7,7	7,35
6	2012	7,53	7,53	7,8	7,58

Note: MAC = Minimum Achievement Criteria

The data show that the success of Civic Education subject in these two schools from year to year could be considered low. The assumed cause is the teachers' inaccuracy in giving formative evaluation in this subject because a correct evaluation result is the strong foundation for scoring. Therefore, teachers are expected to be able to not only master learning materials but also give correct evaluation. A study on learning achievement of Natural Science subject by Daydy (2013) shows that after controlling students' IQ, the mean score of students given formative test using essay questions was better than those given multiple-choice questions.[6] The results of study conducted by Iryana (2009) showed a significant correlation between contextual learning and the development of students' character. [7]

Instead of the accuracy in giving evaluation, cognitive style of students can be one of the determint factors of the success teaching and learning. Cognitive styles are among the factors that play a vital role in affecting students' academic performance. [8] Understanding students' cognitive styles may help teachers identify and solve learning problems among students; thus,

teachers may help their students to become more effective learners. [9] The use of different learning method have different impact on learning performance of students with different learning styles. [10] The study conducted by Yessy Harun (2009) also revealed that students' field independent learning style was more influential than field dependent learning style.[11]

Based on the information above, the research problems can be formulated as follows: (1) Is there the difference in Civic Education subject learning achievement between students doing formative evaluation in the form of essay questions and those doing multiple-choice questions? (2) Is there the difference between students with field independent style and those with field dependent style toward Civic Education learning achievement? (3) Is there the interaction effect between essay formative evaluation, multiple-choice formative evaluation, and cognitive style toward Civic Education learning achievement? (4) Is there the difference in Civic Education learning achievement of students with field dependent style learning with essay and multiple-choice formative evaluation? (5) Is there the difference in learning achievement of students with field independent style learning with essay and multiple-choice formative evaluation? (6) Is there the difference in Civic Education learning achievement between students with field independence and dependence learning with essay formative evaluation? and (7) Is there the difference in Civic Education learning achievement between students with field independence and dependence learning with multiple-choice formative evaluation?

Research Method

The research took place at State Junior Secondary 193 Schools and State Junior Secondary Schools 256 for 5 months. Tis experimental research had 3 essential steps: manipulation, observation, and control. This research used factorial design 2x2, which aimed to know if there was a cause-effect relation after giving treatment to the experimental group whose results were then ompared to the control groups.[12]

There were 2 variables: dependent and independent variables. Independent variables were X_1 (formative evaluation) and X_2 (cognitive style). Formative evaluation was classified into 2: essay and multiple-choice, and cognitive style consisted of field independence and field dependence. One dependent variable was Y = Civic Education learning achievement. The factorial design is shown in the Table 2.

Table 2. Factorial Design 2 x 2

Formative Evaluation / Cognitive Style	Essay (A_1)	Multiple Choice (A_2)
Field Independence (B_1)	A_1B_1	A_2B_1
Field Dependence (B_2)	A_1B_2	A_2B_2

The target population was 275 students seventh graders of Junior Secondary School 193 and 309 students of Junior Secondary School 256 in academic-year 2013/2014. Using multistage random sampling, the research

obtained 11 students with high learning achievement and 11 students with low learning achievement who were placed at the experimental and control groups. The instrument of learning achievement used in post-test was 35 multiple-choice questions with 4 choices (A, B, C, D) for each question. Correct answer got 1, while wrong answer was 0. So, theoretically the range was 0 - 35. For essay questions, the score ranged from 4 - 1, depending on whether the answer was correct or almost correct. The wrong answer got 0. Learning materials of this research was about positive attitude to norms prevailing in society and nation.

The instrument of attitude scale consisted of 5 options. The scoring was as follows: 5 for 'completely agree' (CA), 4 for 'agree' (A), 3 for 'less agree' (LA), 2 for 'disagree' (D), and 1 for 'completely disagree' (CD).

Conceptually, Civic Education learning achievement was a students' ability after doing learning processes in a certain period of time. There were six aspects: knowledge (C1), understanding (C2), implementation (C3), analysis (C4), synthesis (C5), and evaluation (C6). Operationally, Civic Education subject achievement was the score obtained by students after doing learning processes in a certain period of time, shown by the score after doing the test. The mastery level measured was cognitive abilities covering such aspects as knowledge, understanding, implementation, analysis, synthesis, and evaluation.

As mentioned, the test used was 35 objective multiple-choice questions with 4 alternatives (A, B, C, and D). 1 was for a correct answer, while 0 was for a wrong answer. Essay questions consisted of 5 points. Question number one was scored 30, number two 20, number three 30, number four 10, and number five 10. The score for correct and almost correct answers depended on the teachers' policy, while a wrong answer was given 0. As mentioned, learning materials in this research covered positive attitude to norms prevailing in society and nation.

To obtain a valid instrument, the validation of Civic Education learning achievement was conducted by analyzing item analysis using Biserial Point. Because the instrument had a concept of dichotomy with accepted statement being $F_{count} > F_{table} = 0.361$ and the number of participants reaching 30, the items were considered valid. Reliability becomes the requirement which must be fulfilled in using an instrument. The instrument is considered reliable if it can be trusted, is consistent, and shows stable result in measuring something it should measure.

Conceptually, cognitive style is the relatively permanent attitude of someone in accepting, remembering, thinking, storing, forming, and utilizing information. Cognitive style is categorized into field independence and field dependence. Operationally, students' cognitive style has dimension and indicators: 1. Activity; tend to do activities in reaching a goal, 2. Getting along with people; similar to the tendency to socialize, depending on conscience and fun, 3. Being brave to take a risk; having better condition to respond to emerging problems and having strong power in doing a task, 4. Feeling statement; being dependent on psychological emotion and having positive views, 5. Following feeling; tend to follow feeling before taking action or doing activity, 6. Thinking deeply; deciding something effectively and efficiently and tend to think practically without involving emotion, 7.

Responsibility; being perfect in completing a task and having confidence and responsibility in doing the task.

To determine whether the items of instrument were valid or not, r_{count} compared to $r\text{-}_{table}$ equaled to 0.312 at the significant level $\alpha = 0.05$. If r_{count} was more than r_{table},instrument items were valid, and vice versa. Before being used as a data collection tool, the instrument was tried out to 30 students. Therefore, coefficient r_{table} to determine whether the items were valid or not at significant level $\alpha = 0.05$ could be done. To find instrument reliability of students' cognitive style, reliability test was done. It was done using KR 20.

Cognitive style instrument was considered reliable by comparing reliability coefficient (r_{11}) with 0.7. If the calculation result shows that r_{11}> 0.07, the instrument is reliable, and if r_{11}< 0.07, it is not reliable. Based on the calculation, the score obtained was 0.93, and the total variants were 428 with reliability (r_{11}) = 0,950. This showed that (r_{11}) = 0,950 > 0.70 was reliable.

Conceptually, an essay test is a question with an expanded answer. The answer could almost be unlimited. Students' answer is open and flexible, showing their skill in synthesizing and evaluating. Besides this, the essay test could increase students' motivation, is easier to make, gives little room for speculation, and encourages students to be courageous in giving written opinion.

To generate an ideal essay test, there should be some points taken into account: 1) using essay questions only to measure meaningful learning achievement, 2) making questions which have certain answers, 3) not asking attitude or opinion, 4) starting questions with words such as compare, give reason, etc., 5) not giving a chance for students to only select a part of questions, 6) firstly writing an ideal answer, then making questions.

The process of the research was divided into two stages: (1) treatment process, and (2) control process of internal and external validity. Treatment process covers: *First*, selecting 2 out of 8 classes used for experiment based on homogenous students' ability. Based on the data of Civic Education learning achievement and the results of Likert-scaled cognitive style, seventh grade students were chosen. *Second*, choosing the experimental and control groups by doing lottery. The result was that grade seven 1 was an experimental class, which was given essay questions, and grade seven 4 was a control class, which was given multiple-choice questions.

The treatment in experimental research was implemented in two groups. The first group was taught using essay questions (experimental class), and the second group was taught using multiple-choice questions (control group). The treatment of these two groups was conducted by Civic Education teachers at Junior Secondary School 193 and Junior Secondary School 256. The learning materials taught were norms prevailing in society and nation taken from School-Based Curriculum 2016.

The treatment covered three aspects: a.This research focused on Civic Education subjct, b. Formative evaluation was given using essay and multiple-choice questions, c. Treatment for two groups was conducted from January to March for 8 sessions, and 1 session was for test.

Table 3:Treatment for the Experimental and Control Groups

Activities	Essay Test (Experimental Group)	Multiple Choice (Control Group)
Preparation	1. Delivering materials 2. Giving essay questions to students 3. Determining an essay test 4. Determining the scoring criteria for the essay test 5. Making agreement on the time for doing the test	1. Delivering materials
Implementation	1. Delivering materials suitable to the determined basic competency 2. After learning,students make summary and write comments. All answers are stored in folder 3. Teacher observes and scores students' learning development in every meeting session	1. Explaining materials in detail 2. Students listen and make notes 3. Giving a chance to students to ask questions
	1. Students are asked to give comments on their friends' answers	1. Giving test to know students' learning achievement

To make sure that the results of the research were the real effect of treatment, variables influencing the results of the research were controlled. The control process consisted of: a. Internal control validity, which was done to control the experiment processes in order that the emerging differences were really due to the essay and multiple-choice questions, not because of distraction factors such as the influence of history (e.g. school environment, time allotment, learning schedule), students' absences, measuring instrument, the influence of group members, test, and research instrument. b. External validity control, which was done in order that the results could be representative and generalized. External validity control was categorized into two parts: (1)Population validity, which was obtained due to the control of population as research subjects. This validity was controlled by taking samples suitable to population characteristics. Sample technique used was multistage random sampling, (2) Ecology validity, which covered: a. not telling students that they were the research objects, b. Making classroom similar to daily condition, c. Treatment was given by their teachers, and d. Giving treatment similar to daily condition, (3)Test treatment, which was done by giving test carefully, and the experiment was conducted similar to daily learning model, (4) Test procedure, which means not telling students that the test was part of the research.

Data was analyzed using two-way variant analysis (ANAVA) with 2 x 2 factorial design. Before using ANAVA, normality and homogenous tests

were conducted. To test the normality of data Liliefors formula was applied, and Bartlett formula was applied to test data homogeneity of data.

Results and Discussion

A. Data Description

1. The results of students given essay formative test (A_1)
   Maximum score obtained from this group was 86, minimum 60, mean score 72.82, standard deviation 9.58, variance 91.77. The range between maximum and minimum scores was 26, class interval 6 and the number of classes 5.
2. The results of students given multiple-choice formative evaluation (A_2)
   Maximum score for this group was 83, minimum 60, mean score 70.18, standard deviation 7.58, variance 57.39. The range between maximum and minimum scores was 23, class interval 5 and the number of classes 5.
3. The results of students with cognitive field independence (B_1)
   Maximum score for this group was 86, minimum 60, mean score 72.68, standard deviation 9.80, variance 96.18. The range of maximum and minimum scores was 26, class interval 6 and the number of classes 5.
4. The results of students with field dependence (B_2)
   Maximum score for this group was 83, minimum 60, mean score 70.32, standard deviation 7.33, variance 53.75. The range between maximum and minimum scores was 23, class interval 5 and the number of classes 5.
5. The results of students with cognitive field independence who were given essay formative evaluation (A_1B_1)
   Maximum score for this group was 86, minimum 76,mean score 81.73, standard deviation 3.00, variance 9.02. The range between maximum and minimum scores was 10, class interval 3 and the number of classes 4.
6. The results of students with cognitive field dependence who were given essay formative evaluation (A_1B_2)
   Maximum score for this group was 69, minimum 60, mean score 63.91, standard deviation 3.01, variance 9.09. The range between maximum and minimum scores was 9, class interval 3 and the number of classes 4.
7. The results of students with cognitive field independence who were given multiple choice formative evaluation (A_2B_1)
   Maximum score for this group was 70, minimum 60, mean score 63.64, standard deviation 3.58, variance 12.58. The range between maximum and minimum scores was 10, class interval 3 and the number of classes 4.
8. The results of students with cognitive field dependence who were given multiple-choice formative evaluation (A_2B_2)
   Maximum score for this group was 83, minimum 70, mean score 76.73, standard deviation 3.66, variance 13.42. The range between maximum and minimum scores was 13, class interval 4 and the number of classes 4.

B. Analysis of Testing Requirement

a. Test of Data Normality
   Normality test was conducted using Liliefors, at significant level $\alpha = 0.05$. Utilizing *Excel for Windows 2007*, L_0obtained from 8 groups (A_1, A_2, B_1, B_2, A_1B_1, A_1B_2, A_2B_1, A_2B_2) was smaller than $L_t$at significant level α =

0.05.Thus, this can be concluded that research samples came from the population with normal distribution.

b. Test of Data Homogeneity

Based on calculation results, χ^2_{count} obtained was 0.726, while χ^2_{table} with dk = 3 at significant level $\alpha = 0.05$ was 7.81. This shows that $\chi^2_{count} < \chi^2_{table}$ or 0.440 < 7.81. With regard to accepted criteria, H_0 was accepted.Thereby, the four groups came from homogenous population.

C. Hypothesis Testing

Hypothesis testing in this research was conducted by two-way analysis of variance (ANAVA), followed by Tuckey test, if there was interaction in the test. Two-way ANAVA was used to test main influence and interaction between formative evaluation and cognitive style toward Civic Education learning achievement. By using ANAVA, the research obtained the following analysis.

Table 4. The result of two-way ANAVA

Source of Variants	**db**	**JK**	**RJK**	**F_{count}**	**F_{table}**	
					α = 0,05	**α = 0,01**
Formative evaluation	1	76,45	74,45	6,89*	4,08	7,31
Cognitive style	1	61,45	61.45	5,54*	4,08	7,31
Interaction (A x B)	1	2627,27	2627,27	236,79**	4,08	7,31
Error	40	443,82	11,10			
Total	43	3209,00				

Note:

** = significant α = 0.01
* = significant α = 0.05
dk = degrees of freedom
JK = sum squares
RJK = mean of sum squares

Based on the data above, it can explained as follows:

1. The analysis result of two-way ANAVA between column showed that F_{count} = 6.89 was more than F_{table} = 4.08 at significant level $\alpha = 0.05$. Based on the calculation above, it can be concluded that H_0 was rejected, so H_1 was accepted, namely: Civic Education learning achievement of students given essay formative evaluation was higher than the learning achievement of those given multiple-choice formative evaluation. After finding the significant difference, the next step was finding which treatment was better toward Civic Education learning achievement. Based on the result of calculation, the mean score of students given essay formative evaluation (A1) was 72.82. It was higher than students given multiple-choice test (A2) at 70.18.

2. The analysis result of two-way ANAVA between line showed that F_{count} = 5.54 was more than F_{table} = 4.08 at significant level α = 0.05. It means $H_0$was rejected, so $H_1$was accepted: Civic Education learning achievement of students with cognitive field independence was higher that the learning achievement of those with cognitive field dependence.
3. The analysis result of two-way ANAVA between column and line showed that F_{count} = 236.79 was higher than F_{table} = 7.31 at significant level α = 0.01. It means $H_0$was rejected, so $H_1$was accepted, namely: There was interactional influence between formative evaluation and cognitive style toward Civic Education learning achievement. Thereby, the third hypothesis stating that there was interaction between formative evaluation and cognitive style was accepted at significant level α = 0.01. The interaction is illustrated in the picture below:

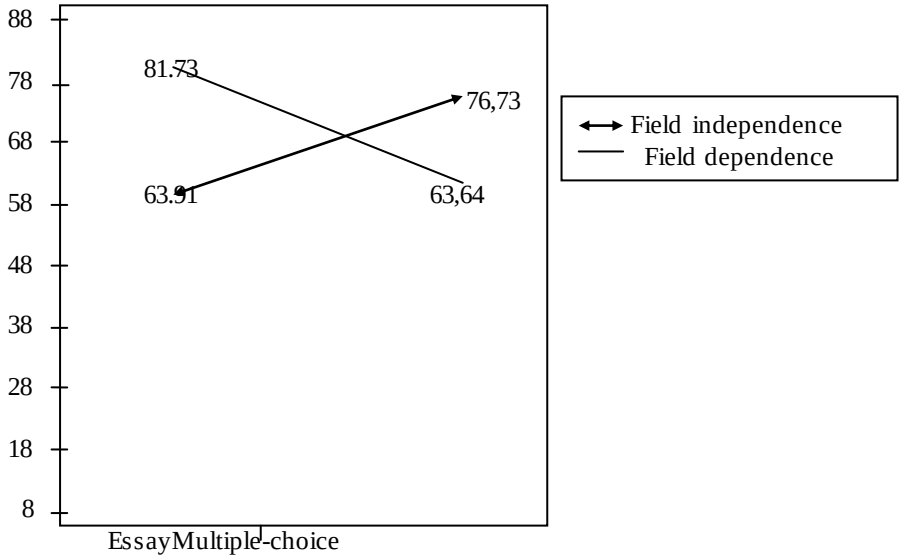

Figure 1: Interaction between Essay Formative Evaluation and Cognitive Style

Since it has been proven that there was significant interaction between formative evaluation and cognitive style toward Civic Education learning achievement, the next step was doing further test. Because the number of subjects in cell (group) was the same, Tuckey test was conducted.

4. For groups $A_1B_1$and A_2B_1; $Q_h$was more than $Q_t$or 18.01 > 3.82 at α = 0.05. It means $H_0$was rejected, and $H_1$was accepted. Thereby, the first hypothesis stating that Civic Education learning achievement of a group of students with cognitive field independence who were given essay formative evaluation was higher than a group of students given multiple-choice evaluation. This was accepted significantly at α = 0.05.
5. For groups $A_2B_1$and A_2B_2; $Q_h$was more than $Q_t$or 12.76 > 3.82 at α = 0.05. It means that $H_0$was rejected, and $H_1$was accepted, namely: Civic Education learning achievement of a group of students with cognitive field dependence who were given essay formative evaluation was smaller than a group of students with cognitive field dependence who were given multiple-choice formative evaluation. This was accepted at α = 0.05.

6. For groups $A_1B_1$and A_1B_2; $Q_h$was more than Q_t or 17.74 > 3.82 at $\alpha = 0.05$. It means that $H_1$was accepted, and H_0 was rejected, namely: Civic Education learning achievement of students with cognitive field independence was more than those with field dependence given essay formative evaluation. It was accepted significantly at $\alpha = 0.05$. Thereby, students with cognitive field independence had higher score if given essay formative evaluation.
7. For groups $A_2B_1$and A_2B_2; $Q_h$was more than Q_t or 13.03 > 3.82 at $\alpha = 0.05$. It means that $H_1$was accepted, and H_0 was rejected, namely: Civic Education learning achievement of students with cognitive field independence given essay formative evaluation was higher than those given multiple-choice evaluation. Thereby, the fourth hypothesis stating that Civic Education learning achievement of students with cognitive field dependence who were given essay formative evaluation was accepted significantly at $\alpha = 0.05$. Thereby, students with cognitive field independence had higher score if given multiple=choice formative evaluation.
8.

Table 5.The Results of Tuckey Test

No.	Statistical Hypothesis	Q_{count}	Q_{table} (α = 0,05)
1.	μ A_1B_1> μ A_2B_1	18,01*	3,82
2.	μ A_2B_1< μ A_2B_2	12,76*	3,82
3.	μ A_1B_1> μ A_1B_2	17,74*	3,82
4.	μ A_2B_1< μ A_2B_2	13,03*	3,82

Note:
* = significant

Based on the results of analysis of variance and Tuckey test above, it can be concluded that:

1. The first hypothesis stating that Civic Education of students with cognitive field independence given essay formative evaluation was higher than those given multiple-choice formative evaluation proved significantly at $\alpha = 0.05$.
2. The second hypothesis stating that Civic Education of students with cognitive field independence was higher than those with field dependence proved significantly at $\alpha = 0.05$.
3. The third hypothesis stating that there was interaction between formative evaluation and cognitive style toward Civic Education learning achievement proved significantly at $\alpha = 0.05$.
4. Civic Education learning achievement of students with field independence given essay formative evaluation was higher than those given multiple-choice questions; this was accepted significantly at $\alpha = 0.05$.

5. Civic Education learning achievement of students with cognitive field dependence given essay formative evaluation was smaller than those given multiple-choice evaluation. This was accepted significantly at $\alpha = 0.05$.
6. That Civic Education learning achievement of students with field independence given essay formative evaluation was higher than those with field dependence proved significantly at $\alpha = 0.05$.
7. That Civic Education learning achievement of students with field independence given formative evaluation was smaller than those with field dependence was accepted significantly at $\alpha = 0.05$.

Discussion

1. The First Hypothesis

   This research found that there was the difference in Civic Education learning achievement between a group of students given essay formative evaluation and those given multiple-choice evaluation. This was shown by two-way ANAVA: $F_{count} = 6.89 > F_{table} = 4.08$ proven significantly at $\alpha = 0.05$.

   According to Grounland (1985), this is because essay formative evaluation is a kind of test which asks students to formulate an answer and state it using their own words. This activity is related to application, analysis, synthesis, evaluation, ability to express written expression, and elaboration.[13]

   Different from multiple-choice formative evaluation, students need more time to understand every test item. This is because a number of items in multiple-choice need their own solution and analysis to answer.

2. The Second Hypothesis

   The second hypothesiswhich states that Civic Education learning achievement of students with cognitive field independence was higher than those with field dependence was accepted. This can be seen from the significant difference of mean score between those two groups.

According to Wockfolk (1993),field independence and dependence have some differences.[14] One of the differences is that field independent students can analyze and reconstruct a situation, and can solve the problem without supervision. Therefore, field independent students can respond better to an essay test as the test can be done by students who are serious in study.

The finding of this study is in agreement with the research by Harun who found that field independent style greatly influences History learning achievement of students taught using quantum teaching method, compared to inquiry method.[15]

The characteristics of essay and multiple-choice formative evaluation connected to field independent and dependent styles are predicted to give different result. Field independent students will achieve better result in Civic Education if given essay test, while field dependent students will get higher score if given multiple-choice test. Thereby, it is predicted that there is a difference in Civic Education learning achievement between students with cognitive field independence and those with field dependence.

3. The Third Hypothesis

The third hypothesis which states that there was interaction between formative evaluation and cognitive style toward Civic Education learning achievement was true. This was proven by F_{count} = 236.79 which was higher than F_{table} = 7.31.This can be concluded that giving formative evaluation needs to take students' cognitive styles into account.

Formative evaluation is part of learning strategy which includes some techniques given periodically during learning processes in order to monitor students' progress and give feedback to students and teachers. Connecting students' cognitive style to essay test in formative evaluation, cognitive style is suitable for essay test, namely the sequence in problem solving and organizing skill. Field independent students can respond better to essay test because this kind of test has characteristics which can be achieved by students serious in study. Essay test asks students to express their opinion using their own words. Generally, this test is used to measure higher order learning achievement such as analysis, synthesis, and evaluation.

On the other hand, multiple-choice test asks students to select one of correct choices. The merit of this test is that it can be constructed to measure learning objectives of all levels, except the ability to demonstrate skill. The alternative answers in this test can reduce the possibility of choosing a correct answer if students guess. Item difficulty, however, can be controlled by changing the level of homogenous answers.

If essay and multiple-choice formative evaluation is connected to field independence and dependence, it can be guessed that the result can be different. Field independent students will get higher score in essay test, while field dependent students will get better score in multiple-choice test. To get a maximum learning achievement, teachers need to know students' cognitive style, so teachers can choose and decide an appropriate formative test. Thereby, there is interaction between cognitive style and formative evaluation toward Civic Education learning achievement.

4. The Fourth Hypothesis

The fourth hypothesis stating that Civic Education learning achievement of students with cognitive field independence who were given essay writing formative evaluation was higher than those given journal formative evaluation was accepted.

Students' cognitive style will greatly influence how they process information. Field independent students tend to analyze and synthesize information when they are faced by complex and unstructured problems without being helped by a teacher to solve them. Field independent students learn unstructured learning materials easily. It means that materials not explained in detail by teachercan be understood. Also, during learning processes, field dependent students like to write down the summary of lesson. They have more time and opportunity to analyze and synthesize learning materials. So, when a teacher finishes explaining, they can ask questions about the material they do not understand.

The characteristic of field independent students is that they are independent in study. There is a similarity between students' character and

essay test which demands seriousness in study.This is because the form of essay test itself can be achieved by students who are serious in study. Essay test requires students to express opinion using their own words because Civic Education does not only require memorization. Field independent students do not use their spare time to learn with other students in the classroom by having discussion under a teacher's supervision, but they try to solve their problem by themselves.

Comparing essay test with students having high independence, field independent students will respond to essay test well. The characteristics explained above also show that essay test needs deep thinking to answer. It means that the characteristic of essay test is suitablefor students with cognitive field independence.

If connected to Civic Education, students with cognitive field independence given essay formative evaluation are related to the characteristic of learning autonomy. This is because essay formative evaluation also asks students to learn independently to find their own answer confidently. A teacher asks students to listen to his/her explanation, make the summary of learning materials, and analyze and synthesize the materials. Students can ask a teacher about the materials they do not understand. This can stimulate independent students to work harder.

5. The Fifth Hypothesis

Civic Education learning achievement of students with field dependence who were given essay formative evaluation was smaller than learning achievement of those given multiple-choice formative evaluation. It was accepted significantly at $\alpha = 0.05$.

Field dependent students tend to take information as it is.All information coming from teachers is treated as a precious thing which should be kept and applied in learning activities. Therefore, students with cognitive field dependence heavily rely on teachers. It means that students can learn well when teachers optimize students' learning moment. Another characteristic is external motivation. Students want appreciation during learning processes. The appreciation can be praise, support, and reward. Another characteristic is that students need study group. During study, they can absorb materials well if there is interpersonal interaction with a teacher and other students. Multiple-choice formative evaluation gives better result for field dependent students. Multiple-choice test requires students to select a correct answer of several available alternatives. The merit of this test is that it can be constructed to measure learning objectives of all levels, except the ability to demonstrate skill.The available choices of answer in this test which are usually four or five can reduce the possibility of choosing a correct answer if students guess. The difficulty of test items can be controlled by only changing the homogenous level of alternative answers.

If connected to Civic Education, students who tend to be field dependent will get more advantages using multiple-choice formative evaluation. It will easier for them to learn Civic Education. This is similar to the characteristic of field dependent people who tend to think thoroughly and see an object as a unity of environment, so their perception will be

easily influenced by the environment. Besides, they also have a good memory on society and constitution. Therefore, multiple choice test can be constructed to measure learning objectives of all levels, in which test items are many so that in limited time the topic coverage is wider, and it can be constructed to differentiate various levels of truth at the same time. This is done by asking the test takers to select a correct answer of alternative choices. The choices which are usually more than two can reduce the possibility of choosing the right answer if the test taker guesses. The level of difficulty can be controlled by changing the homogeneous level of alternative answers.

6. The Sixth Hypothesis

That Civic Education learning achievement of students with field independence who were given essay formative evaluation was higher than the achievement of those with field dependence proved significantly at $\alpha = 0.05$.

Essay formative evaluation is a measuring tool which gives students a chance to develop their intellectual potential in an activity arranged by themselves as a convincing answer to problem through data & information tracing process and logical, critical, & systematical thinking.[16]

Field dependent students heavily rely on a teacher.[17] It means that they can learn better if a teacher optimizes their learning moment. Another characteristic is external motivation. Students want recognition or appreciation during learning processes. The appreciation can be praise, support, or reward. Students tend to think holistically and view an object as an integral unit of environment, so their perception is easily influenced by environment. Besides that, they have good memory on social information.

To optimize Civic Education learning achievement, field dependent students who were given essay formative evaluation in learning processes could learn more seriously and fun. It means that students can be motivated to learn seriously because they learn without a teacher's pressure in fun situation.

Civic Education learning achievement of students with field independence who are given essay formative evaluation will be higher than the achievement of students with cognitive field dependence.

7. The Seventh Hypothesis

That Civic Education learning achievement of students with field independence who were given multiple-choice formative evaluation was smaller than the achievement of those with field dependence was significantly accepted at $\alpha = 0.05$.

Doing formative evaluation, a teacher will give students more opportunity to ask questions. Implementing multiple-choice formative evaluation as a tool to measure learning achievement is very appropriate for students with cognitive field dependence.[18]

Students with cognitive field dependence will find Civic Education easier to learn.[19] This is similar to the characteristic of field dependent students who tend to think holistically and view an object as an integral unit of environment, so their perception is easily influenced by

environment. Besides this, they have good memory on social and constitutional information. Therefore, this kind of test can be used to measure learning objectives of all levels in which test items are many so that in limited time the topic coverage is wider, and it can be constructed to differentiate various levels of truth at the same time. This is done by asking the test takers to select a correct answer of alternative choices. The choices which are usually more than two can reduce the possibility of choosing the right answer if the test taker guesses. The level of difficulty can be controlled by changing the homogeneous level of alternative answers.

Thereby, Civic Education learning achievement of students with cognitive field independence who answer multiple-choice questions is assumed to be different from the achievement of those with cognitive field dependence. It is predicted that field independent students will get higher score.

Conclusions, Implications, and Suggestions

Based on the result of hypothesis testing which has been elaborated above, it can be concluded as follows:

1. Civic Education learning achievement of students who did essay test is better that the achievement of those doing multiple-choice test.
2. Civic Education learning achievement of field independent students is better than the achievement of field dependent students.
3. There is interaction between formative evaluation and cognitive style toward Civic Education learning achievement.
4. Civic Education learning achievement of field independent students doing essay test is better than the achievement of those doing multiple-choice test.
5. Civic Education learning achievement of field dependent students doing essay test is smaller than those doing multiple-choice test.
6. Field independent students get better score in doing essay test than field dependent students in Civic Education subject learning achievement.
7. In terms of multiple-choice question, field independent student get smaller score than field dependent students.

Implications

Based on the results of the research, test and cognitive style have significant effect on Civic Education learning achievement. Thereby, this research has the implication especially for test planning and development which will be used in improving learning achievement of Civic Education subject.

The result showing that students doing the essay test is better than those doing multiple-choice test has the implication for giving appropriate test. The teachers' role is important in increasing Civic Education learning achievement by deciding appropriate test, for example by considering students' cognitive styles. Field independent students could get better result by doing essay test, while field dependent students could get better score when doing multiple choice test.

This research shows that there is interaction between test and cognitive style toward Civic Education subject learning achievement. The interaction has

some implications: (1). Giving similar test to all student may not be beneficial since students have different cognitive style; (2).even though students' cognitive style has been taken into account, inappropriate test can influence their learning achievement. Thereby, giving appropriate test can increase students' learning achievement when it takes students' cognitive style into account.

Suggestions

1. To increase learning achievement of Civic Education subject, teachers need to give appropriate test. Teachers also need to know and consider students' cognitive styles.
2. School principals need to give teachers the opportunity to develop their own test, so that learning activities can be varied and fun for students.
3. Further research need to develop another research which involves other factors not included in this research. There are still many factors which can increase learning achievement of Civic Education subject, for example evaluating if students already practice norms in their lives, so that the objective of this subject can be achieved.

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The Effect of Method and Writing Interest on the Students Poetry Writing Ability at Indonesia Language and Literature Education Study Program of Fkip Uhamka

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Abstract: ***The aim of this research is to determine the effect of teaching learning method and students writing interest on their poetry writing ability at Indonesia Language and Literature Education Study Program of UHAMKA. The research method used is experiment with factorial design 2x2 two ways ANOVA and the research subject was divided into 2 groups which was done randomly, they are the experiment class and the control class. The population of the research areall students of the Indonesia language and literature education study program, however the population can be reached on this research is students of the fifth semester which consists of 4 parallel classes. The technique used to get the sample is multi stage sampling by following these steps: firstly, deciding students of semester V in 2015-2016 academic year as the purposive sampling. Then, deciding one class as experimental class (Collaborative Method) and the other class as the control class (Individual Method).Based on the findings, the research yields that (1) there was a significant difference in students' writing ability on poetry, students who studied using collaborative method is higher than those who studied individual method.(2) The students' ability on Poetry writing who have higher writing interest and studied with collaborative method are higher than those who studied using individual method. (3) In average the students' ability on writing poetry who has low interestand studied with collaborative method is lower than those who studied with individual method. (4) There was an influence of interaction between collaborative method and individual method with high and low intereston the students' ability in poetry writing.***

Keywords: collaborative, individual method, poetry writing, interest

1. Introduction

Poetry writing activity is not an easy one to be done by everybody because to write a good poetry he needs a specific diction to represent the writer in transferring his idea. Besides, in writing a poetry everybody needs a wide imagination on the things that he is going to express. There are people can write a poetry easily but there are some need concentration to produce a good poetry. Based on the writer observation on the students of Indonesia language and literature education study programof FKIP UHAMKA, their ability in writing is still low while they have learnt or joint the Literature Writing subject in their class. These could happen because of some factors such as their lecturer had lack of experience in poetry writing, he did not use the suitable method in teaching poetry writing and even more he gave theory simply to the students instead of giving chances to have practice in poetry writing to his students. Generally the students result in writing practice were not handed out by the lecturer so they did not know whether their poetry was good or not. These conditions make the students' intereston poetry writing becomes low.

Hedge[1]states teaching writing especially to graduate students tends to run away from the purpose of writing itself that is good communication in writing. Many teaching practices in writing characterize in arranging limited sentences in which the lecturers' way in teaching in class is only on pushing the students to master the sentence structure by using guided writing.

In order to make the students are able to write well, thus the literature writing lecturers should concern to the factors which will cause the students ability in poetry writing low especially on the Indonesia language and literature education study programof FKIP UHAMKA.

The inability or the weaknesses of the students writing ability on poetry is also seen on the low of their interestin joining poetry writing competition which is held in every Language Month (BulanBahasa) at UHAMKA itself, Jakarta Province or National. Beside that the students are also less interested in poetry writing to be published in mass media.

Based on the data got from Indonesia Language and Literature Education Study Programof FKIP UHAMKA, the students score in poetry writing is not satisfied yet. It probably could happen because the method used in teaching the lesson in class is not good or not suitable. By choosing a good teaching learning method, it is hoped the students will be interested to write poetry and finally they will be productive writers.

In term of that, Ahariet al[2]in their research state their opinion that the use of suitable method in teaching learning will cause a good result as well. Each method has its own characteristic. Ahari research concludes that contextual teaching and learning (CTL) method is more effective in improving students' kinesthetic ability, while collaborative learningmethod is more effective to improve students' auditory ability furthermore competitive learning is more effective to improve visual ability of the students.Seeing the results above, the writer was interested in conducting further a research on the effect of teaching learning methods (Collaborative, Individual) and students writing intereston their ability in poetry writing of FKIP UHAMKA Jakarta.

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In writing a poetry Rieken[3] gives his opinion that writing is an activity which involving the process of thinking or idea and transferring it onto papers. Writing is someone's continuous activities in which he expresses his idea through written communication to the readers so the readers can understand what he means.In transferring his ideas, a writer has his certain purpose, like what Pea and Kurland[4] mentioned that the purposes of writing something are (1) to think and reflect, (2) writing can help to communicate something to others (3) writing can make someone be a better reader, (4) writing can give something more to the writer than he states his ideas orally. Based on the purposes above, thus a writer has his own choice in delivering his ideas in various form of writing. One of them is through writing a poetry.

Basically every writing has its characteristics. Things that differentiate a poetry compare to other is on its language. The language used in writing a poetry is more intend and has wide meanings. It is really different when writing other literature products which using a simple and direct language. It is similar to what Abrams[5]points out whom said poetry has specific language which is called poetry diction. Poetry diction is characterized by words, phrases, and sentence structure which contain figurative language. Contrary to Leech[6] who stated that poetry language shows different characteristics of language violation to the common language. The violation consists of lexical violation, semantic, phonology, morphology, syntax, dialect, historic and graphology violation.

In order to make the students are able to write well, the lecturer should use various good methods in teaching them. Anthony[7] points out learning method is the implementation of approach and method in the class. In other words, learning method is something which can be implemented. Method in language learning refers to the implementation of lesson plan in front of the class. Learning method means various ways or activities in presenting learning materials for achieving learning goals. In this study the teaching learning method used is collaborative method and individual method. According to Nunan[8]teaching writing by using collaborative method is a learning process to get knowledge or skill, writing in this case is done by restudying and thinking back through talking with others, discussing and need an active participation from the writers to improve their writing. This statement is in line with De Porter dan Hernacki[9] who emphasize the process of writing should be done in these stages; first, *pre-writing stage*, secondly*drafting*or*actual writing stage*, where in this step the students start to write their ideas, thirdly *revising stage where the students should be pushed to revise the content of their writing*; fourth, *editing stage*; and the last is *publishing*.

To be different with collaborative method, individual method has purpose and consideration that children basically do their work in order to achieve their success. Chandler[10] further explains that the goal structure of a learning is individualism, since there is no interaction among the members of the students in the class. Every student only concerns to his own success. However in a writing learning activity, students need to have interest, included in poetry writing activity. In poetry writing activity in the class, students must have high interest. Daniel[11] mentioned that interestis influenced by the feeling of happiness. The patterns of happiness and unhappiness which are formed on every phase of child development are relatively stable on each phase. However, on every following phase, the pattern will have changes in quantity and quality. In different context, Bingham[12] expressed that interest is a tendency to take part actively in an experience and try to keep the experience well. In other words, interest is called as how active someone in doing his experience. Thus, interest can be known through someone's activity, if he is active in doing it, it means he has interest on it, vice versa.

Relating to the activity, Bernard[13] called someone's active or not happens because there are some supports among the people and things, situations or activities in the form of happiness of the person has. Based on the opinions above, it can be concluded that interest has characteristics such as: (1) interest is happiness, (2) interest can be known from how active someone or not, and (3) interest appears because of support from the happiness itself. Based on the points above, so the writer can formulate the problems of the research as follows: (1) Is there any difference in students' poetry writing ability who studied using collaborative method and students who studied individual method?(2) Is there any difference on students' poetry writing ability between the students who have higher writing interest and studied with collaborative method than those who studied using individual method? (3) Is there any difference on students' poetry writing ability between the students who have lower writing interest and studied with collaborative method than those who studied using individual method? (4) Is there any interaction between teaching learning method and writing interest towards on students poetry writing ability?

2. Research Methodology

The purpose of the research is to seek the effect of collaborative learning method and individual method by looking up the students' interest on writing toward their ability in writing a poetry. This research was done at Indonesia Language and Literature Education Study Program of FKIP UHAMKA, at the odd semester of 2015-2016 academic year.

The method used in this research is experiment with factorial design 2 x 2 two ways ANOVA. The population of the research was divided into 2 group which was taken randomly. These groups were divided based on the research classes; the experimental class and the control class. The students in the experiment class were taughtby using collaborative method while the control class students were taught by using individual method.

The design of the research used is *quasi experimental design* by using experiment method of factorial design 2x2.

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Table 1: The Experiment Research Design Factorial 2X2

Treatment / Intervening Variables	Learning Methods (A)	
	Collaborative	Individual
High Writing Interest (B1)	A_1B_1	A_2B_1
Low Writing Interest(B2)	A_1B_2	A_2B_2

The population of the researchis all students at Indonesia Language and Literature Education Study Program of FKIP UHAMKAwhile the achieved population is students at the fifth semester which consists of 4 parallel classes. The technique used in getting the sample is multi stage sampling method by following these steps*; first* purposive sampling decided students of the fifth semester in 2015-2016 academic year as the sample. Then pointed out one experiment class to be taught with collaborative method and the other one as the control class which was to be taught by using individual method.Secondly, using cluster random sampling; the writer grouped the students into high and low interest in writing a poetry.

By taking the sample above, the writer got one class of 40 students to be treated with the collaborative method and the other class (40 students) to be treated with the individual method. Each group was taken 27% from all students who have high interest (11 students) and 27% from students who have low interest in poetry writing. Thus, each cell of this study contains 11students to be observed.

The instruments used in this research are poetry writing test and questioner of students interest in poetry writing. In order to know whether the test is valid and reliable,the writer has done a kind of test trial to the students. Both of the instruments used Person Product Moment formula in knowing their validity. Furthermore to decide whether each item has good validity or not, the correlation coefficients of the items were compared to the r value on the 5% level significance (α =0.05).

The technique used to analyze the research data is Varian Analysis Technique (ANAVA) on the significance level (α=0.05 and α=0.01). When the result of the analysis shows there is interaction, then the research analysis can be continued by using Tuckey test. However, before continuing the analysis statistically, it is necessary to do normality test by using Liliefors and homogeneitytest. The writer used Bartlett formula to have the test of normality on the df α =0. 05.

3. The Research Findings and Discussion

A. Data Description

1) The Students Poetry Writing Score (Y_1) who studied using Collaborative Method
   The students ability on poetry writing who were taught using collaborative method and ignorance the students interest in writing have the score range of 38- 85, with the lowest score is 38and the highest score is 85. The students ability in writing poetry in this group has the average score 65.80, modus score=68.62, median=67.41, and standard deviation=14.07.
2) The Students Poetry Writing Score (Y_2)who studied using Individual Method
   The students ability on poetry writing who were taught using individual method in general has the score range of 35-72, with the lowest score is 35and the highest score is 72. The students ability in writing poetry in this group has the average score 54.75, modus score=57.10, median=55.32, and standard deviation=8.98
3) The students ability on poetry writing score who were taught using collaborative method with the high interest in writing (Y_{11})
   The students ability on poetry writing who were taught using collaborative method with the high interest in writing totally has the range score of 69-89, with the lowest score =69 and the highest score89. The students ability on poetry writing in this group has average score 79.28, modus score= 84.45, median 81.14, and standard deviation=6.18.
4) The students ability on poetry writing score who were taught using collaborative method with the low interest in writing (Y_{12})
   The students ability on poetry writingwho were taught using collaborative method with the low interest in writing totally has the range score of 38-48, with the lowest score =38and the highest score=48. The students ability on poetry writing in this group has average score 45.55, modus score=46.50, median 47.15, and standard deviation=5.80. The students score in poetry writing in this group can be categorized low. The students score in poetry writing who have studied using collaborative method were divided into 5 interval classes.
5) The students ability on poetry writing score who were taught using individual method with the high interest in writing (Y_{21})
   The students ability on poetry writingwho were taught using individual method with the high interest in writing totally has the range score of 55-75, with the lowest score =55and the highest score=75. The students ability on poetry writing in this group has average score 63.21, modus score=59.50, median 62.40, and standard deviation=5.87. The students score in poetry writing in this group can be categorized low. The students score in poetry writing who have studied using collaborative method were divided into 5 interval classes.
6) The students ability on poetry writing score who were taught using individual method with the low interest in writing (Y_{22})
   The students ability on poetry writingwho were taught using individual method with the low interest in writing totally has the range score of 46-60, with the lowest score =46and the highest score=60. The students ability on poetry writing in this group has average score 54.18, modus score=57, median 55.64, and standard deviation=4.45. The students score in poetry writing who have studied using individual method were divided into 5 interval classes.

B. Pre-Requisite of Test Analysis

The testing of the required analysis for hypothesis testing in this research comprises: (1) Requirement meeting that the data sample is derived from the population with normal distribution, which was done through normality test of the data using *Lillieforstest*. (2) Requirement meeting of the

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homogeneity of population variance of the whole groups uses *Bartlett* test.

1) Normality Test Distribution

In normality test, the writer used the significance level α = 0.05 with the degree freedom=11. Based on the result of normality test, it can be got L_o (Liliefors observed) is lower than L_t (the critical value of L table). From the result it can said that all of the group data came from the normal distribution population.

2) Homogeneity Test

Based on the result of *Bartlett test* on the variance level α = 0.05and the degree freedom= 3, it gives the indication that $\chi^2$is lower than $\chi^2_{table.}$ It can be concluded that the four group data which were used in this study came from the homogeny population.

C. Hypothesis Test

In order to perform the hypothesis testing, a Two Way Analysis of Variance with Interaction (ANOVA 2x2) has been conducted. The purpose of this analysis is to see the different influence of learning methods and interest towards the poetry writing ability of the students.

The recapitulation of Two Way Analysis of Variance can be seen in the following table.

Table : The Analysis of Variance

Variance Source	Df	SS	ASS= SS/df	F_o	F_{tabel}	
					0.05	0.01
Writing Interest (B)	1	322.76	322.76	14.60**	4.07	7.22
Learning Method (K)	1	124.11	124.11	5.65*		
Interaction (BxK)	1	685.02	685.02	32.03**		
Inside (D)	40	831,45	22.08			
Total Corrected (T)	43	1913.42	-	-	-	

Note:
** = significant α = 0.01
* = significant α = 0.01
df = degrees of freedom
SS = sum squares
ASS = means of sum squares
F_0 = Score F calculation; F_t = Score F table

Based on the variance analysis above, it can be explained as follows:

1) There was a significant difference in students' writing ability on poetry, students score who studied using collaborative method is higher than those who studied individual method because $F_o = 5.65 > F_t = 4.07$ on the level of α = 0.05.
2) There was a significant difference in students' writing ability on poetry, the students' ability on Poetry writing who have higher writing interest than those who has lower interest,because$F_o = 14.60 > F_t = 4.07$ on the level of α = 0.05.
3) There was an influence of interaction between collaborative method and individual method with high and low interest on the students' ability in poetry writingbecause$F_o = 32.03 > F_t = 4.07$ on the level of α = 0.05.

D. Discussion on The Research Result

In order to see the difference of the learning method effect (collaborative and individual) towards the students' poetry writing, the writer did the further test . The results of hypothesis test are explained as follows;

1) The difference of the students' ability on poetry writing those who studied using collaborative method and those who studied using individual method in general.

   The calculation of the test by using Tuckey test produced the score of Q=12.55 and Q_t=3.52 for the variance level α=0.05 with the degree freedom=4 (numbers of treatment group). If we compare, the Q >$Q_t$on the variance level α =0.05, it can be concluded that $H_0$is rejected. In other words there is a significant difference between the students' ability in poetry writing who studied using collaborative method with students ability who studied using individual method. This difference shows that the average score of students' writing ability who were taught using collaborative method is higher than the students score who were taught using individual method, so the H_0hypothesis is rejected.
2) The difference of the students' ability on poetry writing between who have high interest and studied using collaborative method and individual method in general.The calculation of the test by using Tuckey test produced the score of Q=18.3 and the Q_t=4.26for the variance level α=0.05 with the degree freedom=4 (numbers of treatment group). If we compare, the Q >$Q_t$on the variance level α =0.05, it can be concluded that $H_0$is rejected. Thus the result of the test concludes that there is a significant difference between the students' ability in poetry writing with high interest who studied using collaborative method with students ability who studied using individual method. This difference shows that the average score of students' writing ability who were taught using collaborative method is higher than the students score who were taught using individual method, so the H_0hypothesis is rejected.
3) The difference of the students' ability on poetry writing between who have low interest and studied using collaborative method and individual method in general.
   The calculation of the test by using Tuckey test produced the score of Q=3.67and the Q_t= 3.11for the variance level α=0.05 with the degree freedom=4 (numbers of treatment group). If we compare, the Q >$Q_t$on the variance level α =0.05, it can be concluded that $H_0$is rejected. Thus the result of the test concludes that there is a significant difference between the students' ability in poetry writing with low interest who studied using collaborative method with students ability who studied using individual method. This difference shows that the average score of students' writing ability who were taught using collaborative method is higher than the students score who were taught using individual method in the low interest students, so the H_0hypothesis is rejected.
4) There is an interaction influence between collaborative method and individual method toward the students' ability in poetry writing.
   The result of variance analysis indicated that there is an influence of interaction between collaborative method and individual method toward the students poetry writing ability.It can be seen from the score of F_o =32.03 > F_t =

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4.07 on the variance level α=0.05. It means there is an interaction influence between the learning methods (collaborative and individual method) and students interest on writing poetry abilityin the treatment class students. Thus, the $H_0$is rejected.

4. Conclusion and Suggestion

4.1 Conclusion

Based on the result of hypothesis testing, it can be concluded that:

(1) There was a significant difference between the students' writing ability on poetry who studied using collaborative method and the students who studied individual method. The students' poetry writing ability who were taught by using collaborative method is higher than those who were taught by using individual method.

(2) There was a significant difference on poetry writing ability between the higher interest students who were taught by using collaborative method and students who were taught by using individual method. Thus, for the students who learn or study accompanying with the high writing interest, collaborative method will be more effective than individual method.

(3) There was a significant difference on poetry writing ability between the low interest students who were taught by using collaborative method and students who were taught by using individual method. The average score of the low interest students on poetry writing who were taught by using collaborative method is lower than the students who were taught by using individual method. Thus, for the students who have low interest in writing a poetry, collaborative method will not be as effective as individual method in increasing the students writing ability.

(4) There was an interaction influence between collaborative method and individual method with high and low interest on the students' ability in poetry writing. The students ability in writing a poetry between the low interest ones and the high ones is different, either they were taught by using collaborative or individual method.In can be summed up that grouping the students based on their level of interest on poetry writing is effective enough in finding out the effect of the two learning methods which were applied in this study.

4.2 Suggestion

1) Collaborative method can be used as an alternative one in choosing a learning method to teach poetry writing to the students.
2) The lecturer needs to give reinforcement in order to increase the students interest in writing, so the students finally can improve their writing as well.
3) This study can be developed by adding more other research variables which have relationship on it and also providing the study with wider population and wider sample.

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THE ROLE OF *ZAKAT* IN NATIONAL ECONOMIC DEVELOPMENT

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Abstract

Islam is a recognized religion by Allah SWT. Islam is a proper religion to follow and implement in any epoch. The greatness of Islam is proven by its thoroughness. Islam is happiness in life and afterlife, Islam is ibadah and muamalahh, aqidah and sharia,
civilization and tamaddun. The Islamic sharia was not only founded on aqidah and ibadah, Islamic sharia also put a large emphasis on positive effort in increasing mans' standard of living through building understanding in economic and social activity.

Lately, with the advances in economic around the world, the economic activity is increasing in its complexities. A large portion of today youths are experiencing job and food shortage. The same phenomenon also happens in Indonesia. A lot of people had lost their job, in which more than 86% of Indonesian are Moslems. A lot of economic and social hardship will continue to exist if the economic condition did not recover. As an alternative solution for said problem, zakat is a viable solution to increase standard of living and stimulate spending. As such governmental political will to organize zakat at state level become important to increase awareness about zakat. Governmental role is very important to actualize the essential goal of zakat.

Keyword , Zakat, Infaq and Shadaqah

Introduction

1. Background

It was apparent for most people that Indonesia is experiencing an economic slowdown. Numerous individual become poor or fakir, bankrupt, crippled by debt, their purchasing power decreases, national product decreases, national development programs halted, and Islamic organizations such as Mosque, *Mushalla*, Madrasah, and orphanage experience decrease in support and funding.

In this unstable condition, there are no parties that can help alleviate the situation and increase the standard of living to eradicate poverty. Nevertheless it is very important for all of us to

make an example out of this situation. That it was needed for all of us to be innovative to increase our value as human in order to achieve a better life.

Indonesia had some Islamic charity organization, such as LAZ (*Amil Zakat* Organization), and BASNAS (*Amil Zakat* National Body) to distribute aid to those that are in need. The aid is in the form of clothes, food, housing, financial, training, and job opportunity. However these organizations are restricted in their work because they relied heavily on voluntary charity of *Shadaqah* and *zakat*.

Zakat is one of the five pillars of Islam; as such it was part of the obligatory religious duty of moslem (*fard*) as decreed by Allah SWT. The completion of *zakat* is a non-negotiable duty for moslem, it was not left to individual discretion to be performed of not. If it were to be so, it would mean that those that are faithless will not perform *zakat*, while only those that are faithful will perform it. According to surah Al- Baqarah ayat 43, Allah decreed:

وَأَقِيمُوا۟ ٱلصَّلَوٰةَ وَءَاتُوا۟ ٱلزَّكَوٰةَ وَٱرْكَعُوا۟ مَعَ ٱلرَّٰكِعِينَ ﴿٤٣﴾

Translation: *"And establish prayer and give zakah and bow with those who bow [in worship and obedience]."*

From aforementioned ayat, Allah SWT has decreed that *zakat* become the third pillar of Islam, equal in importance with *sallah*. *Zakat* has a very important place in ensuring equality among the populace. *Zakat* is a guarantee by Allah SWT as a resolution of Islamic social and economic problems. Therefore the importance of *zakat* as a pillar of Islam needs to be understood thoroughly, particularly in creating and sustaining a civilization. Without an institutionalized *zakat* activity, any Islamic society will be crippled. It was further proven in the Al – Quran where there are 8 *asnaf* who qualifies to receive the benefit of *zakat*. It was written in surah At-Taubah ayat 60:

إِنَّمَا ٱلصَّدَقَٰتُ لِلْفُقَرَآءِ وَٱلْمَسَٰكِينِ وَٱلْعَٰمِلِينَ عَلَيْهَا وَٱلْمُؤَلَّفَةِ قُلُوبُهُمْ
وَفِى ٱلرِّقَابِ وَٱلْغَٰرِمِينَ وَفِى سَبِيلِ ٱللَّهِ وَٱبْنِ ٱلسَّبِيلِ ۖ فَرِيضَةً مِّنَ ٱللَّهِ ۗ
وَٱللَّهُ عَلِيمٌ حَكِيمٌ ﴿٦٠﴾

Artinya : *"Zakah expenditures are only for the poor and for the needy and for those employed to collect [zakah] and for bringing hearts together [for Islam] and for freeing captives [or slaves] and for those in debt and for the cause of Allah and for the [stranded]*

traveler - an obligation [imposed] by Allah . And Allah~ is2 Knowing~ and Wise."

From the above mentioned *asnafs*, it was clear that the institution of *zakat* can help to decrease poverty and help to propagate and spread Islamic faith in the face of this earth. Islam teaches us how to organize and process capital by collecting a voluntary (*derma* and *wakaf*) or obligatory (*zakat*) fund from the masses. As such obedience with *zakat* will be rewarded beyond our imagination and disobedience will be met with severe punishment.

وَرَحْمَتِي وَسِعَتْ كُلَّ شَيْءٍ ۚ فَسَأَكْتُبُهَا لِلَّذِينَ يَتَّقُونَ وَيُؤْتُونَ الزَّكَاةَ
وَالَّذِينَ هُم بِآيَاتِنَا يُؤْمِنُونَ ﴿١٥٦﴾

Translation: *"My punishment - I afflict with it whom I will, but My mercy encompasses all things." So I will decree it [especially] for those who fear Me and give zakah and those who believe in Our verses –"*

Even though the *zakat* system is a God given guarantee in tackling societal problem, the extent in which it was implemented to its logical conclusion is very much depended on the economy of the state, the ability of the *zakat* organizer (*Amil Zakat*), and the awareness of the benefactor/tither of *zakat*. *Zakat* is the source of Islamic society economic strength. The *zakat* collection Body/Organization has as its task the God given mandate to coordinate the collection and distribution of *zakat* to the eight *asnaf* as decreed by Allah SWT. If the task is not done properly, the problem of poverty will develop into a bigger problem of blasphemy, and iniquities as the current situation proves. As the prophet Rasulullah Muhammad Saw said: "*fakir* (poverty) is almost *kufr* (disbelief/unbelief)".

The above *hadith* depict clearly that the starvation as a consequence of poverty might bring about the symptoms of greater problem, such as fraud, theft, prostitution, murder, etc. therefore Islamic society needs to invest its effort to develop an integrated *zakat* system on state level to help those that are in need.

From the above explanation, we can conclude that the institution of *zakat* in Islamic society can and will bring about positive changes for the society, aside from the fulfillment of religious duty as decreed by Allah SWT. Nevertheless how fervent and how devout we are in fulfilling our religious duty also important to ensure that the *zakat* done is done with Allah's blessing. A Moslem is never absolved of his duty to conduct *zakat*, precisely because the duty of *zakat* is not only an earthly duty; it also is a transcendental duty. Moreover, it can also be said that a Moslem did not uphold the pillars of Islam if he did not conduct *zakat*.

2. There are some problems in the conducting of *zakat* as Indonesian national economic development.

1. How to organize the *zakat*: State Role Perspective?
2. How is the Development of *Zakat* Conceptual Understanding in Indonesia?
3. How is the technique of *zakat* management within state role perspective?

4. How is the *zakat* management in the early Independence era?
5. How is the problem of *zakat* management in the reformation era?
6. How is the technical problem of *zakat* management?
7. How is the problem in participative model technique?
8. How is the model of fiscal strategy?

3. Proposed Solution

The solutions from the above problems and within the context of *Zakat* organization as

Indonesian National Economic development are as follows:

1. Within Islamic jurisprudence literature there are numerous views regarding the authority of *zakat* organization and management by the state. Several writers contend that state managed *zakat* may only be conducted by Islamic states (i.e. theocracy with Islamic belief as its constitution upholding sharia and *fiqh*). While certain other writers assert that *zakat* management has to be handled by *amil/ Al-Amileen* (i.e. *zakat* collectors), whether said official is appointed by the states or elected or any other means of appointing individual to said office. Elaborating further from history of Islamic taxation and charity in the Rasullullah Muhammad and the following early Islamic empire era, the mandate of collecting and distributing *zakat* fall within the power of the state. *Zakat* management in that time was done by an entity called *waliyu 'amr* which in this case is the Islamic government as decreed by Allh SWT in Al- Qut'an surah At- Taubah: 103. The God given charge of collecting the *zakat* falls on those deemed as *uli-al amri* (literally those that are charged with authority). According to those passages, Islamic jurist (called *faqih*/*fuqaha*) conclude that the authority of collecting and distributing *zakat* fall on the Islamic state (*caliphate*). (11) The statement contain within Al – Qur'an that wealth must not be dominated by the riches, it must also be circulated in all element of society for the sake of social, and economic justice, as decreed in surah Al – Hasyr: 7. Said *ayat* are a general guideline that contain within it a legal elaboration on the *zakat* institution established by the Prophet Muhammad SAW. It is a historical fact that in the early Islamic era, *zakat* held a central role in Islamic fiscal policy[1]. Aside as a source of states' income, *zakat* also sustain governmental spending and help influence Islamic economic policy to increase societal economic well-being, particularly those that are living in poverty (*dhu'afa*).

   According to Syafii Antonio, one of the factors of Islamic government decline is the separation of *zakat* and states' fiscal policy. *Zakat* become an individual concern. The more modern and down to earth caliphate system is then replaced by the monarchial system. The governmental source of income is then appropriated with the monarchial system, such as the usage of taxes and event tributes. The usage of governmental fund is even getting further away from the essence of *zakat*.[2] The monarchs and *fuqaha* in the Middle Ages did not integrate the value of social and economic justice contain in the Al –

[1] Fiscal Policy or more commonly known as Fiscal Politics can be understood as a governmental action in the governmental budget context with the intention to influence the economy. This policy is usually being done together with other policies such as monetary and trade policy.

[2] See Ghafur Wibowo and Faizi, "*Menggagas Kebijakan Fiskal～Islam*4"～Republika (Jakarta), 18 Agustus 2008, p. 6

Qur'an with the institution of *zakat*. As a consequence the socio – economic principle of *zakat* institution was not legalized and implemented in the societal system at large.

In a further development of Islamic economy[3], *zakat* is then relegated as only alms for the poor, while on the other hand surah At – taubah ayat 60 clearly states that *zakat* is used for all the funding needed by modern states. That is why the concept of *zakat* is never discussed as a viable and specific solution in handling Islamic society problem. In line with the development of modes of government in Islamic regions, the management and organization of *zakat* develops along numerous routes. There are some states that instituted state sponsored *zakat* management system, there are some that relegate the *zakat* management to the masses, there are yet others that form an independent civil *zakat* organization that also sanctioned by the government. This diversity is an integral part of the history of *zakat* management.

2. Indonesia is a country with the largest moslem population in the world, the question of *zakat* is then an indispensable feature of Indonesia societal issue. *Zakat* management in Indonesia has a very long history up until now. From the inception of Islam in Indonesia, the concept of *zakat* becomes integrated with the populace. Before the year of 1990, *zakat* management in Indonesia has as its feature such as:
   a. Generally given directly by the *muzakki* (benefactor) to the *mustahiq* (beneficiary) without the use of *Amil Zakat*. This condition is due to the lag of development from the *zakat* organization, such as BAZIZ (*Amil Zakat, Infaq, and Shadaqah Body*) DKI. In the region that lacks BAZIZ, generally *muzakki* gives directly to the *mustahiq*. The awareness of *zakat* is also still very simple. *Zakat* is viewed as purely religious duty without any relevance with the solution of greater problem such as poverty.
   b. Even when the *zakat* is done through the *Amil Zakat*, it was mostly limited to *zakat fitrah* (the largest obligatory *zakat*, usually done in the end of ramadhan month). The situation exacerbate and exposed in the Ramadhan Month or in the few days leading to the holy day of *Idul Fitri*, most mosque and *mushalla* abruptly create its own *Amil Zakat* to collect and accept *zakat fitrah* from the populace in the vicinity of said mosque or *mushalla*. Even then some people still feel that it it much more proper to give directly to the *Mustahiq* without going through the *Amil Zakat* organization.
   c. *Zakat* given to the *mustahiq* are usually consumptive in its character, it was used for short term need. In the moment, the role of *amil* is simply the collection and distribution of *zakat*. The role of managing the *zakat* fund doesn't included in the *amils'* responsibility, therefore the *amil* does not have to be a professional in his field. It all leads to the relegation of *amil* as a part time profession. This condition is exacerbated by the common consumptive attitude in the population at the time. This condition reflects the lack of trust and respect by the population to the *Amil Zakat*.
   d. The wealth object of *zakat* is still limited.
      The *zakat* object at the time is very limited to the wealth explicitly specified in Al – Qur'an or Hadith; gold, silver, farm product (specifically primary food producing crops), ranch animal (limited to cow, sheep, and goat), trade (limited to goods

[3] Fazlur Rahman, *Neomodernisme Islam : Metode dan Alternatif* , (editor : Taufik Adnan Amal), Bandung : Mizan, 1989 p.57-58

commodity), and *rikaz* (found wealth). This is caused by the poor understanding of *zakat*, be it the goal, essence, value, procedure, *zakat* object, and the effort to increase economic activity and wellbeing of the populace. It is further aggravated by the poor effort of the government to educate the population about *zakat*.

According to Didin Hafiduddin[4], the state of *zakat* management in Indonesia after 1990 underwent significant change. The change occurs after the publication of a book called *Fiqh al-Zakat* written by Yusuf Al-Qaradhawi. The book that contains a comprehensive elaboration on *zakat* was written in 1389H/1969 M. It was published bu Muassasah Ar-Risalah, Beirut and was translated to Bahasa Indonesia by Salman Harun, Hasanuddin, and Didin Hafiduddin. The book was published for the first time in Indonesia in the year of 1988 by Pt. Pustaka Litera Antar Nusa in collaboration with BAZIZ DKI.

The most outstanding feature of that book is the inclusion of all legal revenue streams of Moslem as *zakat* object. As long as it passes a certain income threshold called *nishab* then the owner of said income must pay *zakat*. Included within said feature is the revenue obtained from personal or collective expertise or as it was commonly called as *zakat professi* (*mihnah*). For example the income from doctor, lawyer, architect, lecturer, teacher, tailor, employee, or other professions is included in the *zakat* object. It also includes company *zakat* that are managed by a moslem or collectively.[5] The other outstanding point in the book are the assertion that *zakat* must be managed by a professional, responsible, accountable, capable, and willing *Amil Zakat* organization. It can be done by the census of *muzakki* and *mustahiq*, direct, efficient, and proper distribution, and transparent reporting of *Amil Zakat* activity.[6]

3. Since the year of 1990, *zakat* begun to be a popular Islamic strategic instrument in Indonesian Economic Development. This positive change is caused not only by the increasing awareness and willingness of Islamic populace in Indonesia in conducting their religious duty that achieve a significant progress, it was also caused by the increasing governmental effort in stimulating *zakat* payment by the creation of a set of law concerning *zakat*. Said law begins with the institution of Law No.38 1999 about the management of *zakat*.

In the post Soeharto regime, there are 4 key milestones progress of national *zakat* movement as follows: (a) President B. J. Habibie on 23 September 1999 by the accordance of DPR (Indonesian Legislative Bodies) signed and adopted the Law No. 38 of 1999 concerning the *zakat* management. (b) President Abdurrahman Wahid on 17 January 2001 enacted the Presidential Decree No. 8 of 2001 concerning National *Amil*

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[4]See Didin Hafiduddin, *Mutiara Dakwah : Mengupas Konsep Islam Tentang Ilmu, Harta, Zakat & Ekonom Syari'ah*, Jakarta : Kuwais, 2006, p.. 210.

[5] Yusuf Qardhawi, Hukum Zakat : Studi Komparatif mengenai status dan Filsafat Zakat Berdasarkan Qur'an dan Hadis, Translated by Salman Harun et. al., Bogor : Pustaka Litera Antar Nusa, 2007. In the book the zakat object are comprehensively elaborated fromi Bab III to. Bab X.p. 121-501.

[6] The prerequisite of an Amil Zakat can be seen inYusuf Qardhawi p. 551-555.

Zakat Body (c) President Megawati Soekarno Putri on 2 Desember 2001 instituted *Zakat* Awareness Movement in the Nuzulul Qur'an commemoration at Istiqlal Mosque Jakarta.
(d) President Susilo Bambang Yudhoyono on 26 Oktober 2005 instituted *Zakat Infaq* and *Shadaqah* National Movement and instated the organizational structure of BAZNAS 2004-2007 period at Presidential Palace.[8]

From above explanation, we can see that in the governance of those four presidents, Indonesia shows a big commitment in stimulating the growth and usage of *zakat*.

4. In the early independence era, the management of *zakat* in Indonesia was controlled by the government and become a public issue. IT was in the 1951 the Ministry of Religion issued the Circulation Letters No. A/VII/17367 of 8 December 1951 concerning the Implementation of *Zakat* Fitrah. The government, in this case represented by the Ministry of Religion takes up supporting role in the carrying out of the *zakat* by the populace. The Ministry of Religion also has as its duty the overseeing and supervising role to ensure that the distribution of the collected *zakat* is utilized properly according to the sharia. [9]
In the year 1964, the Ministry of Religion composes the Bill of *Zakat* Implementation and the Government Regulation Bill of the Implementation of *zakat* collection and distribution and the establishment of Bait al-Mal, however both bills hasn't been proposed to the House of Representative (DPR) or the President.

5. In the new order era, the Ministry of Religion composes a Bill concerning *zakat*. The bill has been proposed to the Collaborative House of Representatives (DPRGR) through the Letter No. MA/095/1967 of July 1967. In said letter the Ministry argues that:

   "Regarding the Bill concerning *Zakat* and its Principles, on the grounds that the underlying principle of the bill is founded on the Islamic jurisprudence that always applies in the case of Islam as a Religion, therefore the points contained within the bill must always be upheld by Moslems whether the Bill will be adopted as law or not, the Government is obligated to help in the upholding of the essence of the bill by Moslems. Nevertheless the government has a moral obligation to maximize the resulting benefit of the principles, thus it was deemed needed for the bill to be adopted as law".

   The Bill was presented to the Minister of Social Affairs as the responsible party for social issues, and Ministry of Finance as the responsible and authoritative party in the financial collecting. Minister of Finance in his capacity suggested that the collection of *zakat* and any issue thereof should be regulated with the Ministry of Religions' Ministerial
Directive. Further in the year 1968 the Ministry of Religion instituted the Ministerial Directive No. 5 of 1968 concerning the establishment of *Bait-al Mal*. Both ministerial directives are closely related with each other, by reason that the *bait al-mal* has as it functions to accept *zakat*, which will be managed by *Amil Zakat* Body (BAZ) to be distributed to the masses.

   On the year of 1968 Ministry of Religion announce a new Ministerial Directive No. 4 of 1968 concerning The Establishment of *Amil Zakat* Body (BAZ). In the same year the Ministry institutes another Ministerial Directive No.5 of 1968 concerning the Establishment

if *Bait Al-Mal*. *Bait Al-Mal* in the aforementioned Ministerial Directive is a

semiofficial foundation that accepts *zakat* funds that will be submitted to *Amil Zakat* Body as outlined in the Ministerial Directive No.4 of 1968.
On the year of 1984 Ministry of Religion enacted the Ministerial Instruction No.2 of 1984 on the 3rd of March 1984 concerning to one thousand rupiah *Infaq* in the duration of the Ramadhan Month the implementation of which are regulated by the Directorate General of Islamic Community Development and Hajj Affairs Decree No. 19/1984 of 30 April 1984. On 12th of December 1989 was enacted the Ministry of Religions' Ministerial Instruction No. 16/1989 concerning the development of *Zakat*, *Infaq*, and *Shadaqah* that delegates all element of Department of Religion to provide assistance to affiliated religious organization that perform the management of *zakat*, *Infaq* and *Shadaqah* to ensure that the fund was used to develop Islamic Education and other means. On the year of 1991 it was enacted a Joint Ministerial Decree between Ministry of Religion and Ministry of Interior No. 29 and 47 of 1991 concerning the Development of *Amil Zakat*, *Infaq*, and *Shadaqah* Body which was followed by the Ministry of Religion' Ministerial Instruction No.5 of 1991 concerning the Technical Development Guidelines of *Amil Zakat*, *Infaq*, and *Shadaqah* Body; and Ministry of Interiors' Ministerial Instruction No.7 of 1988 concerning General Training of *Amil Zakat*, *Infaq*, and *Shadaqah* Body.
Notes about the Law No. 38 of 1999 concerning *Zakat* Management.

After the Law No. 38 of 1999 concerning *Zakat* Management was enacted, numerous new *zakat* management institutions and organizations are formed. The management and link between those institutions and organizations is being developed and improved continually. Such that the organization can be an engine in the decentralization, independence, and development of public economy. However, the actual potential of *zakat* remains untapped according to numerous scholars. *Zakat* remains a voluntary activity, an alms for the poor, which the state has no control over said activity.

Within the numerous regulations, law, instruction and decree mentioned above, there still exist a number of fundamental flaws, such as the absence of punishment for the contentious *muzakki* that refuse to pay *zakat*. Aside from that the fundamental flaws within the regulations are as follows:

- Did not empower *Amil Zakat* Body to enforce and collect *zakat* payment from *muzakki*.
- Did not empower *Amil Zakat* Body to audit and examine the exact wealth of the *muzakki*, while the *muzakki* did not deterred by punishment for disobedience with the regulations of *zakat*.
- There is no clear mechanism if the *muzakki* directly distribute the *zakat* to the *mustahiq*, whether the *muzakki* need to provide a prove of payment to *Amil Zakat* Body that will be legalized by *Amil Zakat* Body and used to request a tax amnesty on the *zakat* value.
- In the case of *zakat* that are directly deducted from the employee paycheck from an institution and no prove of payment are provided, it will be a potential loss for the *muzakki* if the payment of *zakat* does not goes through legalization process by *Amil Zakat* Body.

The aforementioned law has pushed for the establishment and development of a trusted, credible, reliable, and strong *zakat* management organization for the populations.

6. On the latest development in Indonesia concerning the revision and amendment of the *zakat* management law, among the strong support of instituting *zakat* as a fiscal policy instrument, there also exist an opposing current that desire to preserve the participative model of *zakat* management.

7. This model desire that the government become regulator, motivator, and to ameliorate privately formed *zakat* management organization (LAZ). It means that the *zakat* management organization must not be nationalized or institutionalized by the government. The reason for such are:

   First, The LAZ has been able to popularize *zakat* and obtaining the confidence of the populations. Even though there are still inefficient and ineffective LAZ in collecting and distributing *zakat*. It was caused by fundamental problem such as the low quality of human resource, organizational capacity, weak management, and no standardized public accountability.

   Two, if bureaucracy become stronger then the government sponsored *zakat* management organization will also become stronger. On the other hand if the bureaucracy is getting weaker, the *zakat* management organization will also become weaker as the public confidence in governmental structure lowers.

   Third, in this reformation and democratization era there is a marked increase of civil participation in government and national development. One of the things that the LAZ did was managing the assets of the populace far before the birth of the Law No.38 of 1999 concerning *zakat* management. There is a marked increase of populaces' confidence in *Amil Zakat* Body (LAZ) that also increase the LAZ social role and responsibility in accordance to modern Indonesia context. In such context the government needs to open up a public participation sphere to induce participation in eradicating poverty. Here the government are expected to acts as regulator, motivator, and to ameliorate privately formed *zakat* management organization and also to provide a conducive infrastructure and environment for civil movement development. The government must not take over too much of public effort as it will stifle the growth of the public participation and creativity.

8. In this vein, essentially the government must become operator or the implementer, the reason of which are:

   First, *zakat* collection can be enforced on the ground of Al – Qur'an surah At – Taubah ayat 103. While the only body that has a legitimate authority to enforce such collection are the government through governmental apparatus such as taxation. If this proposal are implemented, then *zakat* can become another source of national revenue.

   Second, very large potential of uncollected *zakat* from the population. According to the research done by the Language and Culture Center of UIN Syarif Hidayatulla and Ford

Foundation in 2005 suggest that the philanthropist potential of Moslem in Indonesia reached up to 19.3 trillion Rupiah per year.[7]

Third, *zakat* has the potential to help achieving national development goals. The large *zakat* fund has a large potential to increase the purchasing power of Indonesian people, thereby increasing the standard of living in Indonesia if the *zakat* are integrated in the national development plans.

Fourth, it bequeaths control to the governmental elite that so far had been plagued by corruption. These phenomenons are caused by the lack of faith and the lack of devotion that leads to the inability to resist temptation to misuse governmental resource. With the introduction of *zakat* in the governmental asset it was hoped that it will remind the corruptor that what they are corrupting are *zakat* fund, a divinely ordained fund that must not be misused.

4. Conclusion

Regarding the above elaborations there are some points that need to be underlined. As a Moslem we certainly wants *zakat* as a big potential that has a big role in Indonesia, As such governmental political will to organize *zakat* at state level become important to increase awareness about *zakat*. Governmental role is very important to actualize the essential goal of *zakat*.

Concerning the objection on the effort to enforce the administration of *zakat* here can be explained. It was due to the length of time that *zakat* become separated with the state system, and become private matters. To revert back into a state centered system is not an easy task, it need an approach to put amend differing viewpoints.

There are much good to be reaped in making *zakat* as an instrument in the government financial policy. The governing bodies establish its status as clean government by solving national economic problem, as a consequence it was hoped that the peoples' confidence in the government will also increase, which in turn will maximize the potentials of *zakat*.

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USING *QUIPPER* AS AN ONLINE PLATFORM FOR TEACHING AND LEARNING ENGLISH AS A FOREIGN LANGUAGE

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Abstract

This paper evaluates the affordability of *Quipper* as an online platform for teaching and learning English as a foreign language (EFL). It focuses on the extent to which features available in *Quipper* may correspond to fundamental components of Computer-Assisted Language Learning (CALL) pedagogy, as suggested by Chapelle (2003), including L2-input exposure, interaction and linguistic production. The evaluation results indicate that *Quipper* is affordable for use as an online teaching and learning EFL platform. More importantly, it corresponds to the three conditions of CALL pedagogy, thus making it a potential aid for activities used in teaching and learning foreign language.

Keywords: Online platform, learning management system (LMS), teaching and learning English as a foreign language (EFL), computer-assisted language learning (CALL).

1. Introduction

The advanced development of Information and Communication Technology has provided excellent opportunities for teachers and students to experience English language teaching and learning activities beyond their traditional classrooms; that is, through online learning. Literature on the use of technology in EFL classrooms has suggested a number of benefits from using online learning modes, such as the Web, wikis, blogs and other online learning platforms, on the development of students' language skills (for example, see Alshumaimeri, 2011; Jung, Kudo, & Choi, 2012; Sun & Yang, 2015).

Furthermore, many ELT professionals and ICT practitioners have written reviews about technology for classroom use to help teachers to keep updated with information about types of technology suitable for language teaching and learning. In the *Teaching English with Technology Journal*, I noted four interesting reviews, namely those by Ciaffaroni (2003); Elturki and Hussein (2011); Kiliçkaya (2007); and Michalak (2015). Unfortunately, there are still few articles in the journal that evaluate learning management systems (LMS) for the teaching and learning of English online.

In this paper, I will examine the use of *Quipper* as an online platform for EFL learning. Specifically, I will evaluate the affordability of *Quipper* from a technical perspective; that is, whether or not some features available in *Quipper* help teachers expose students to L2 input, facilitate interaction among teachers, students and between teachers and students, and whether they promote students' linguistic production. To help readers understand the following discussion, I will provide a brief definition of two terms used in online learning and LMS. The term 'online learning' (also known as 'e-learning') is used to explain the use of the Internet as a technological tool that enables users to interact with the content, with other users; and to get support during the process of learning so that they can acquire knowledge, construct personal meaning, and to experience learning (Ally, 2008).

In addition, the term 'learning management system' (LMS) is described as an online learning platform, software that is devised to organise and manage learning (Anderson, 2008; Paulsen, 2003). More specifically, LMS is defined as a "systemic infrastructure that manages the learning process of an entire organization" (Watson & Watson, 2007, p. 28). LMS is characterised by three fundamental features, namely the creation of course tools (the creation of modules, learning materials and group work), student and tutor support tools (access to learning materials, teacher-students and student-student communication) and administrative systems (registration, course enrolment, and grouping students – Paulsen, 2003).

The paper is organised according to five sections. Section 2 that follows provides an overview of *Quipper*. Section 3 informs the readers about the basic operation and features of *Quipper* that have potential for foreign language learning. The evaluation of *Quipper* features is presented in Section 4 and, finally, conclusion and recommendations are offered in Section 5.

2. An overview of *Quipper*

Quipper, also known as Quipper School, is a web-based online learning application. It was originally developed by Quipper Ltd. located in London. *Quipper* opens its representative offices in four countries, namely Japan, the Philippines, Indonesia and Mexico.

Quipper has been used by millions of teachers and learners around the world, including those in the Philippines, Indonesia, Thailand, Mexico, the United Kingdom, India, Russia and Turkey. This may be why some languages available on *Quipper* correspond to those countries, including English, Japanese, Filipino, Bahasa Indonesia, Mexican-Spanish, and Thai.

Unlike other similar web-based learning management platforms such as *Moodle*, *Claroline*, *ATutor*, *Omeka* and *Docebo* that need installation on an existing hosting site (or a web server), *Quipper* provides teachers and students with a ready-to-use web-based learning application. It also supports teachers via virtual storage that allows them upload and keep their PowerPoint presentations, PDF files, pictures and videos online. Furthermore, the storage helps teachers maintain their teaching and learning activity records on the web server; thus, they can monitor their students' learning without encountering constraints of time and place. It is interesting that the use of these facilities in *Quipper* is completely free, although it requires registration.

3. Basic operation and features

Quipper is available online at http://school.quipper.com. The system is user-friendly as *Quipper*'s menu and sub-menu feature a simple design and accordingly, users can navigate all facilities available on the system with ease. This ease of using technology, as argued by Teo, Lee and Chai (2008), may promote users' positive attitudes towards the particular technology (such as *Quipper*), and may eventually be a contributing factor to using it.

Figure 1. *Quipper*'s welcoming screen.

To start using *Quipper*, both teachers and students are required to sign up for an account. They can either use their *Facebook* accounts or create a new, free *Quipper* accounts. To get a free account, teachers and students need only to provide an email address, telephone number, and the name of the school. If their school has already registered in the *Quipper*

database, teachers then can make a request to the *Quipper* ambassador at the school to assign their account into the virtual school classroom.

After registration, users can then log in into the system with the username and password they have already created. What is important to note is that *Quipper* will initially ask the user's role when logging into the system (see Figure 1). There are two roles for users: teachers and students (see Table 1). Each of these roles allows different access to *Quipper*'s three main features, which are 'Creation', 'Assessment' and 'Learning'.

Table 1. Menu and sub-menu in *Quipper*'s dashboard.

Role	Main menu	Sub-menu
Teachers	Overview	Overview, performance
	Assignments	Assignments, examinations
	Curriculum	Curriculum
	Message	Message (personal), announcement
	Manage	Students, groups, teachers
Students	Assignment	To do, try it again, mastered
	Messages	Messages, notices
	Study notes	Study notes

The 'creation' feature deals with setting up the learning classroom, the materials and the student participants. The 'assessment' feature facilitates teachers' use of the learning materials (lessons and quizzes) and assigning them to students. Learners then access these learning materials on the 'learning' feature. In addition to the three main features, *Quipper* provides a help facility (displayed as a question mark icon) to help teachers and students to understand the functions of each menu.

The 'teacher role' enables teachers to have full access to *Quipper*'s three main features. The role also grants teacher access to 'overview', 'assignments', 'curriculum', 'message' and 'manage' menus. The 'overview' menu provides brief information about active assignments submitted by the students ('overview sub-menu'), and students' individual performances ('performance sub-menu'). The 'assignment' menu allows teachers to create new assignments, distribute them to students and monitor their progress. The 'curriculum' menu offers two options for teachers regarding the learning materials; they can either use the materials available on the *Quipper* database, or they can develop their own materials and use them to teach their students. The 'message' menu has two functions; firstly, it facilitates

teacher-student communication, and, secondly, it allows teachers to distribute notes to all students. Finally, the 'manage' menu allows teachers to select course participants, group the students, and invite other colleagues to teach collaboratively within the virtual classroom.

The 'student' role is limited to accessing *Quipper*'s learning features. As shown in Table 1, three main menus on the student dashboard include assignments, messages and study notes. The assignment menu informs students about tasks that need to be completed. The menu also notifies them about the tasks they have already done and their level of mastery. In addition, the 'message' menu allows learners to interact with their teachers and peers. Unfortunately, this facility is suitable only for communication between two individuals, which may make group discussions difficult. The other study note menu allows students to write personal notes related to a topic or an assignment. It is important to highlight here that student users can only access the learning materials according to the classroom (course) already provided by their teachers.

4. Evaluation

In this section, I will evaluate *Quipper*'s features in terms of its affordability as an online English teaching learning platform. Special focus will be placed on whether or not these features address the three conditions of CALL pedagogy suggested by Chapelle (2003): L2-input exposure, interaction and linguistic production. In order to do this, I attended a *Quipper*-mediated English teaching and learning activities at a senior secondary school in Indonesia. My role at that time was as a teacher.

4.1. Affordability of *Quipper*

Technically, the *Quipper* web application meets all three standards of online learning platforms as described by Paulsen (2003), namely the creation of course tools, student and tutor support tools and course administration. The course-creation tools on *Quipper* are easy to use, and the student- and tutor- support tools address both teacher and students' engagements in teaching and learning activities. For example, teachers can create a lesson that can be accessed by their students. Unfortunately, despite the availability of the administrative system, *Quipper* does not offer an administrative function. Teachers, therefore, need to set up a new classroom (course), create learning modules, and select the participating students themselves. This administrative workload may be challenging for some teachers to some extent, particularly for those who are not familiar with a web-based learning management system.

4.2. CALL pedagogy elements in *Quipper*

Chapelle (2003) suggests three conditions of CALL pedagogy that EFL teachers should consider when incorporating technology into language learning classrooms; these are the availability of L2-input exposure, interaction and linguistic production.

(a) *Quipper* features enhance L2 input exposure

According to Chapelle (2003), the use of computer technology in the classroom should bring benefit to learners through enhanced linguistic input. The three types of language input suggested by Chappelle are salience (e.g. interaction with a grammar application), modification (providing any means that help learners to arrive at the meaning, such as through images), and elaboration (providing explanations). *Quipper* addresses these types of enhanced learning input.

As a web-based learning platform, *Quipper* offers learners multimodal exposure (written, aural and visual) for foregin language input. For example, teachers can develop learning materials that are enriched by visual and audio media, such as text with illustration, images, videos or other multimedia resources. In order to do this, teachers can employ the multimedia tools available in 'lesson' and 'assessment' menus.

Figure 2. Embedded video from *YouTube.*

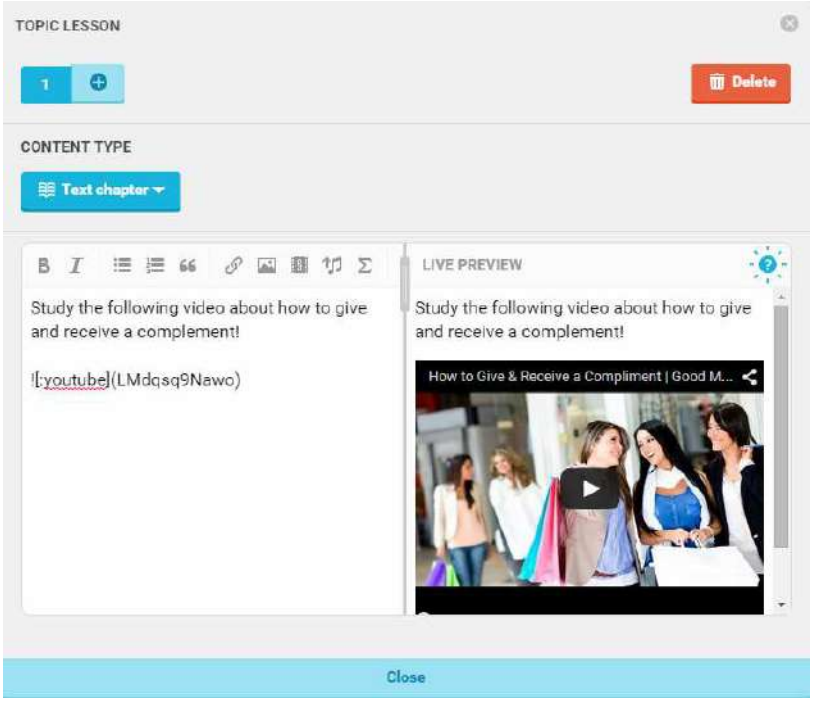


Figure 2 above illustrates how teachers can embed images, audios, or videos in the lesson content or in assignments. The incorporation of multimedia applications in the learning

materials in *Quipper* not only motivates students but also improves students' understanding of word meanings and linguistic forms from texts presented by the teachers.

Unfortunately, *Quipper* is not enhanced with a speech recogntition technology, technolgy that can identify or recognise words or spoken expressions. Such an absence reduces an opportunity for the students to interact with the computer verbally, thus, the learning of speaking is not feasible for the students.

(b) *Quipper* features promote classroom interactions

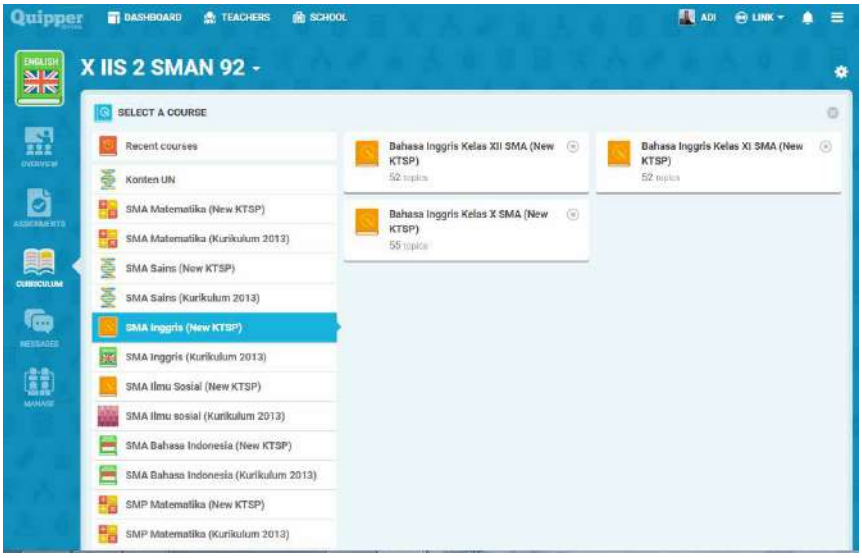
The use of CALL applications in EFL classrooms should also provide an opportunity for teachers and learners to interact, either within synchronous (real-time) or asynchronous (not-realtime) modes (Chapelle, 2003). Chapelle (2003) highlights three types of interaction that teachers should promote within language learning tasks: interpersonal interaction, learner-computer interaction, and intrapersonal interaction. In *Quipper*, teachers and students are given an opportunity to get engaged into interpersonal communication. The 'message' and 'announcement' features help teachers to interact with colleagues and students. In addition, teachers can work collaboratively with their colleagues when developing a learning curriculum, or can design lessons (assignments) for the pupils together. To do this, teachers initially need to invite colleagues into their classroom through the Teacher Page, via email or on the Class Page, as shown in Figure 3 below:

Figure 3. Inviting colleague to participate

In addition to interacting with colleagues, teachers can interact with the *Quipper* content developer through the 'curriculum' feature. The curriculum menu as shown in Figure 4 allows teachers either to develop their own curriculum (learning materials), or to use the

available materials developed by the *Quipper* content developer in the *Quipper* database. These teacher-colleagues and teacher-content developer interactions are advantages of *Quipper* that, as far I have observed, are not available on other similar online learning platform.

Figure 4. Curriculum available in *Quipper* database



In addition to teacher-student interaction, student-student interaction is offered through private messaging (peer-to-peer) and 'group work' feature. Unfortunately, the 'group work' feature does not provide room for students to discuss a particular topic or work collaboratively. In other words, the limited functionality of private messaging and group work features indicates that collaborative learning activities for students seem to be difficult to promote using these features.

What is interesting about the *Quipper* features for teachers, students, and teacher-student interaction is the integration with social media platforms such as *Twitter* and *Facebook*. This social media integration enables teachers to build social relationships with their colleagues and students effortlessly, and to monitor their students' interaction and the progress they have made without having constraints of time and place. Another advantage for students is that social media are integrated into the *Quipper* system because this not only helps students to socialise with their peers, it also keeps them updated about their learning progress. As argued by Donato (1994), social interaction may promote collective scaffolding that helps students perform the language they are learning beyond their linguistics ability.

With regard to intrapersonal interaction, *Quipper* provides useful tools called 'Hint' and 'Explanation' for the students' assignment. The 'Hint' and 'Explanation' features enable

teachers to give their students help (e.g. with clues or explanations) in order to answer questions on a test or in a assignment. They also provide an opportunity for students to stimulate their inner voice and become involved in deep cognitive processing of input (Chapelle, 2003). It is interesting that teachers can also use the 'Hint' and 'Explanation' features to provide learning feedback to their students, as such features can be accessed by students during and after they complete an assignment. These two types of students' access to the learning feedback are of course subject to teachers' personal choices when developing assignments for students.

In addition to interpersonal and intrapersonal interaction features, *Quipper* provides a chance for learners to interact with a computer, although this seems limited. Students can only interact with a computer through the lessons and quizzes previously set up by their teachers. The use of a flash application that enables more learner-computer interactions (such as language games and computer-user communication applications) is unfortunately not available in *Quipper*, as it requires teachers to have advanced computer skills.

(c) *Quipper* faciliates students' lingusitic production.

According to Chapelle (2003), the incoporation of technology in the EFL classroom should promote learning tasks that afford a wide variety of opportunities for learners to produce the the target language. Chapelle (2003) suggests that learners' language production within CALL tasks should provide students with chances to plan before speaking or writing, to receive feedback so they can correct their linguistic output, and to suggest a learning scaffolding.

Figure 5. Question types in *Quipper*

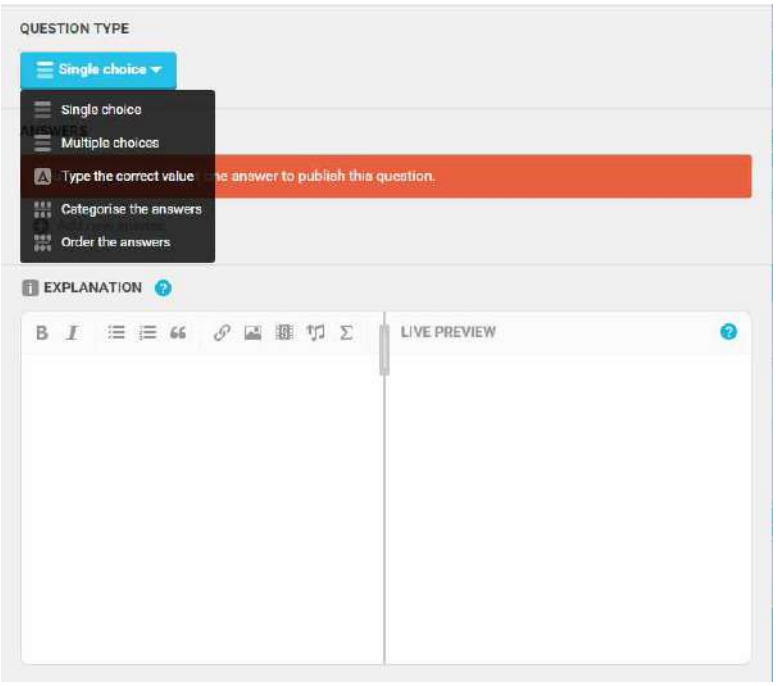
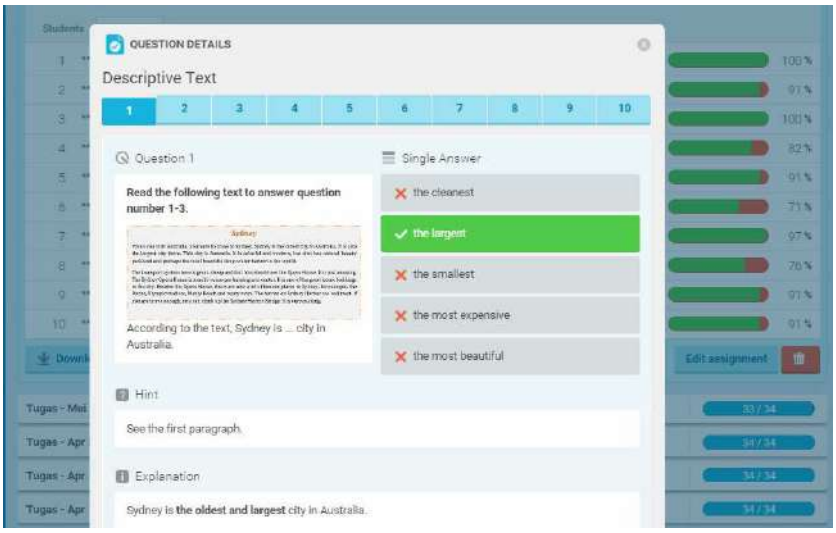


Figure 6. Feedback and explanation features on *Quipper*



In *Quipper*, students' linguistic production is facilitated through the assignment feature; however, production is limited to aspects of students' writing skills such as vocabulary and grammar. Question types in the *Quipper* assignment system include a single answer, multiple answers, correct values, correct order, and categorise answer questions (see

Figure 5). The limited range of question type is reason for such a limitation and they should therefore be brought to the attention of the developers for further improvement of the system.

5. Conclusion and recommendation

In summary, *Quipper* fits the three conditions for an online learning platform, which makes *Quipper* affordable for EFL teaching and learning. More importantly, *Quipper* addresses the three conditions of CALL pedagogy suggested by Chapelle (2003), which are L2-input exposure, interaction and linguistic production. Personally, I have attended virtual English learning classrooms designed using *Quipper* for four months as a teacher and found this online learning platform particularly useful for promoting independent learning for the students, with support from teachers as well as from their peers. The greatest value I perceived regarding *Quipper* was that the features were user-friendly, and it supported the school's English curriculum. I also found *Quipper*, as an online platform, to be a feasible alternative for teachers to assign learning tasks to students outside the classroom. This is because *Quipper* grants teachers access to monitoring students' engagement with the task and enables them to evaluate their achievements, particularly in the areas of students' learning to read, listen and write English.

Acknowledgement

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Using Technology in Foreign Language Teaching
(Book Review)

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The integration of information and communication technology (ICT) into foreign language (FL) learning classroom not only suggests learners' positive attitude towards learning (e.g. see Li, Chu, & Ki, 2014) but also transform the language learning and literacy acquisition atmosphere as well as the dynamic of language learning settings (Young, 2003). The book entitled *Using Technology in Foreign Language Learning* aims to explore underwhich conditions technologies used in the learning environment can best be utilized. To achieve this objective, this 13-chapter book with an introductory chapter by the book editors examines the ICT integration into FL classroom learning from the perspectives of actual users and professionals from different countries namely the United Arab Emirates, Saudi Arabia, Oman, Iran, and Malaysia. Six main issues are addressed in this edited volume including (1) the principled approach to integrating technology into course design, (2) approaches to the evaluation of computer-assisted language learning software (CALL) software, (3) the practice of blended learning, (4) teachers' view on technology integration, ICT knowledge and computer skills, (5) the practice of online learning in FL classroom setting, and finaly (5) the use of digital application, and Theories on integrating technology into language teaching practice are also discussed along with a brief summary of each chapter. Readers could benefit from this provision that they can choose which of the chapters may meet their needs and conditions. It is interesting that the book chapters are predominated by a number of studies that were conducted in diverse educational settings and employed using a variety of research methodologies. Moreover, pedagogical implications from the study are presented at the final section of each book chapter. It is therefore, as the editors argue, the book may provide evidence and suggest valuable insights for FL professionals, researchers as well as postgraduate students specifically regarding the ICT integration into FL classroom settings.

In the introductory chapter, the editors, Al-Mahrooqi and Troudi, provide a brief history of computer technology in language learning setting, its advantages as well as challenges that teachers may encounter when incorporating technology in classroom teaching practice. The editors also emphasise some crucial requirements that an FL institution have to meet for incorporating technology such as a solid infrastructure, teachers' and students' attitude towards computer and their computer skills.

A synthesis of relevant literature on approaches for technology integration is discussed in two chapters: chapter 1 and chapter 13. Chapter 1 *Blended learning in EFL: Adopting a principled approach to integrating technology,* authored by Claire Whittaker, focuses on a principled approach for technology integration within a blended learning environment. Whittaker's discussion in chapter one might be considered as both a short summary and improvement of her early works which appeared in Tomlinson and Whittaker (2013). Only in this chapter, she promotes her thoughts on "how to achieve the principled approach to integrating technology into courses by determining the degree of overlap, the drawbacks and suggesting how we can proceed from this point" (p.8). Whittaker perceives the principled approach as "a systematic approach to the design process that is driven by pedagogy, that adds value to learning, and that is underpinned by language learning theory" (p.9). In order to attain a principled approach for technology integration into a blended language learning course design, Whittaker evaluates various framework and principles. What fundamental from the chapter is that the frameworks and principles

addressed by the author seems to fit Reem Al Elbaikan and Salah Troudi's and Richard Peel' research that appear respectively in chapter 2 and 7. Those who are newcomers in incorporating technology within the field of foreign language teaching and learning, thus, will find this chapter beneficial as it also explores the shift of paradigm emphasizing "how various technology can be employed in language teaching to giving pedagogy a central role and organizing activities in the areas of language learning" (p.8).

Review of related literature for technology integration is also discussed in chapter 13 entitled *Approaches to the evaluation of computer-assisted language learning software*. In the chapter, the authors, Vahid Nimehchisalem and Jayakaran Mukundan attempt to seek a proper method for CALL software development and evaluation. They examine the various evaluative criteria and/or instruments suggested by ELT scholars for software evaluation (p. 286). Nimehchisalem and Mukundan argue that the recent frameworks available in CALL literature do not suggest a balanced representation of technical and pedagogical aspects required when evaluating CALL software. For example, the evaluation framework provided by software companies does not satisfactorily address the language skills while the instruments developed by ELT scholars pay much attention to the skills and less focus on technical features in the survey questions. Alternatively, they suggest the need for "a balanced focus on both predictive (before use) and retrospective (while or after use) CALL software evaluation" (p. 298).

The rest of the chapters in this edited volume report eleven studies from two different settings: blended learning environment and online learning setting. Two research reports on the practice of blended learning within FL classroom setting are presented in chapter 2 *Blended learning in Saudi Arabia: Potential for its use in EFL at the tertiary level* and in chapter 7 *Challenge and change in online reading: Learners' perception of textbooks and reading online*. In chapter 2, the authors, Ebaikan and Troudi, discuss their study on the potentials of adopting blended learning for EFL teaching and learning in Saudi Arabia. The study is interesting as its findings provide "insights into blended learning's potential for the teaching especially women in Saudi context" (p. 31). The authors believe that blended learning may increase the effectiveness of learning processes regarding the Saudi's culture that segregate sexes in all aspects of life including education (p. 37). Chapter 7 reports Richards Peel's study exploring the use of textbooks and reading online in the blended learning environment in the United Arab Emirates (UEA) context. While in the chapter two the emphasis is on "the essential role of the face-to-face element of blended courses" (p. 30), in this chapter seven, Peel attempts to examine learners' perceptions of the use of traditional textbooks and online reading (via the Internet and through programmes such as BlackBoard Vista [BBV]). The finding is quite surprising as it suggests that the online reading is less popular despite students' positive perception of the usefulness of online reading course (see p. 148). Some plausible factors that contribute to the findings as identified by the author include generational differences (digital natives, digital immigrants, and digital illiterates), learning style preference, learner types (visual learners, auditory learners, kinesthetic learners and read-write learners).

The practices of online learning in FL classroom setting are presented in seven chapters: chapter 3, 4, 5, 6, 8, 9 and 12. Chapter 3 entitled *Self-access or access to self?: Experimenting with e-learning in Oman* presents a fundamental view on learner autonomy and learner independence. The authors, Alina Rebecca Chirciu and Tulika Mishra examine "the relationship between self-access learning and self-directed learning in English language education in Oman, by presenting the case of a higher education institution and its implementation of an e-learning platform" (p. 45). The finding of their study suggests that teachers' motivation and autonomy correlate with student motivation and autonomy. Chirciu and Mirsha write, "Student motivation to engage in self-access is directly proportional to the teachers' motivation to engage in it too" (p. 55). Chapter 4 *Integrating information and communication technology (ICT) into EFL classroom practice at Majma'ah university* and chapter 5 *Critical approach to integrating ICT into second language learning* follow up the view presented earlier in chapter 3 by demonstrating teachers' perspective of technology integration, ICT knowledge and skills. Teachers' use of ICT is also accounted within these two chapters.

In chapter 6 entitled *IT and L2 writing skills: EFL students' perceptions of e-feedback on their essays*, the authors, Susan Riley and Alireza Zareekbatani address two issues: (a) the advantages as well as the limitations of the use of information and communication technology (ICT) application in corrective feedback provision, and (b) L2 learners' perspectives on using e-feedback to reduce their local and global mistakes (p. 106). Chapter 8 *The internet chat room: A tool for promoting learner*

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autonomy reports Jo Mynard and Salah Troudi's study that examined ten new students' autonomous language learning when participating in a classroom-based chat room. Mynard and Troudi highlight some factors that suggest students' engagement with the learning activity enhanced by technology including students' motivation, individualised learning opportunity, design of the task, interaction, the effect of virtual learning environment. Kirsten Gear' study that is presented in chapter 9 *The self access centre WebQuest* still makes an issue related to learning autonomy. In her study, Gear focuses on promoting authentic materials as well as learner' learning independence through the use of WebQuest. She applied a constructivist-based student centred learning (SCL) platform in order to develop student-centered EFL and ESP WebQuests. In chapter 12 entitled *Online language corpora: Implications for EFL teaching*, Shaimaa Abd El Fattah Torky emphasises on the potential use of online language corpora for EFL learning. She evaluates "the practical implications of integrating corpus consultation into the EFL learning environment" (p. 253). Torky suggests an eclectic method to respond challenges in incorporating online language corpora into EFL classrooms.

The use of digital application in classroom setting is presented in two chapters. Al-Mahrooqi and Naqvi's study on ICT integration into digital video project-based instruction appears in chapter 10 entitled *Fostering EFL students' language development via student-created digital videos*. The result of their study shows that students positively perceived the ICT integration into their digital video project based learning activity. More importantly, the study revealed students' improvement on their vocabulary, reading and oral written communication ability. In addition to Al-Mahrooqi and Naqvi, Sandhya Rao Mehta explores the potential use of digital literatures in ELT and their discussion appear in chapter 11 *Is small really beautiful? Exploring digital literatures and their relevance to English language teaching (ELT).*

Overall, the book provides a comprehensive discussion in the area of CALL, specifically the practices of blended learning and online learning. The focus on learning autonomy and motivation which is promoted throughout the pracitice of blended learning and online learning is deliberately maintained by almost all the authors in the book. The fact that the book is composed by actual users and professionals and their writing is based upon academic research suggests evidence-based exploration of blended and online learning within EFL classroom environments. The contexts provided in this book are limited to higher education institutions within Arab countries. This may explain why gender issues in FL classroom is so concerned in the book and are successfully addressed by some of the authors.

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NOTE:
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