A Comparative Analysis of New Ecological Paradigm (NEP), Ecosystem Knowledge, and Students' Self-Control Based on Gender

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Abstract— Objective of this research was to verify whether there is differences of male and female students (gender) concern with ecosystem knowledge, internal-external self-control (LOC) and New Ecological Paradigm (NEP). An Ex post facto used by selecting randomly 362 students from three big city in Indonesia.. There were three instruments developed to measure students' NEP (62 items, reliability/rel. 0.87), knowledge (17 items, rel. 0.72), and LOC (17 items, rel. 0.63). Data analyzed by t-test and confirmatory factor analysis. Research results revealed that there was no significant differences of male and female students related to ecosystem knowledge, LOC and students' NEP. The mean of students' ecosystem knowledge was differ between male and female students found in city of Palembang. It could be concluded that, based on those findings, education has a vital role in affecting non-discrimination treatments among those variables involved based on gender equality. Even though students stay in different cities background, their knowledge about ecosystem, LOC and NEP based on gender have a similarity due to educational system. Based on factor analysis, female students' NEP has higher internal consistency than male students in term of its factor loading and number of factors omitted. It is argued that female student has wider ecological view and more sensitive in responding the environmental issues, where none of research, so far, reported about this case.

Index Terms—Comfirmatory Factor Analysis, Gender Equality, Self-Control (LOC), New Ecological Paradigm (NEP).

I. INTRODUCTION

"Gender is a social perception regarding with quality of life, achievement, or competence in their participation at a specific traditional community, especially viewed by their families about the role of men and women in society. Men and women got different treatments in society while they are working even they have the same performances at work institutions where men are the head of families (Johnsson-Latham, 2007)[10] It is one of example how discrimination really happened in developing society which required a wise policy from each country to improved their index of gender equality approaching zero point, to at least minimize discrimination treatment among people. (wikigender.org. 2012).

In any development process, in every developing country, the role of economic, education and population policies are inevitable factors which should not be neglected. According to Johnsson-Latham (2007) gender equality stated as a conditions that both men and women has equal treatment and opportunity to experience their life with full of freedom without any pressure by the authority, especially how they decided anything related to their life experiences.[10]

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Therefore, one of the organization in Europe (OSCE, 2009. pp.7-8) proposed specialty in gender equality which mostly the program concerning with how to improve equality between men and women who survive for their lives in society in term of their education, opportunity to be paid fairly at work-place, job opportunity, position in any company, institution, or even in government sector, treated by all policies, in any conflict negotiation, etc.[15] That is why, in this case, education has a vital role in affecting all of public policies concern with instructional process experienced by students to avoid bias gender related to knowledge, personality (locus of control is a part of personality) and paradigm. Related to the environmental paradigm, it should be examined the view of Stern, et.al. (2000) which depicted that new environmental paradigm determined by people values orientation consisted of three dimensions, biospheric, egoistic, and altruistic. [20] If we work by applying paradigm, we will improved fast due to its change rapidly (Covey, 2008).[3] Measuring this paradigm in form of scale reflected as how people wisely view the ecosystem as a world perception (Cotton, 1978). [2]

He continued that "NEP would measure about people view in perceiving the environment because they felt that they were part of the environment as opposed to others which viewed that the environment could be destructed for human basic needs for survived. That was why New Environment Paradigm (NEP) instead of Dominant Social Paradigm (DSP) should be developed in order to try to describe of a human map, to see the position, whether people against their ecosystem or conversely eager to preserve the environment for future generation (see Steger, et.al.,1989 in Geno, 2000, Dunlap, R.E. 2008) [6, 5]. They have developed NEP scale, by implementing 6, 12, and 15 items based on five dimensions of NEP proposed by Dunlap,R.E. (2008).[5]

Related to knowledge, Bloom (1979) described that knowledge dimensions consisted of knowledge of facts, principle, methods, categorical, classification, and trends which could be used in measuring knowledge.[23] Regarding with ecosystem, Dash (2009) classified its components which consisted of concept of energy, biogeochemical cycle, diversity, ecological pyramid, etc.[14] The objective of students learn about ecosystem is to try to improve their pattern of thinking in how to think globally and act locally For this purpose, Bechtel, et.al. (2010) has implemented those concept in a wider aspects of knowledge which also included the concepts of sustainable development, biodiversity, and natural

conservation. [1] Basically, discussed about LOC perceived as one of human characteristic which closed to personality, especially in how individual interact to other in responding his success or failure (Rotter, 1966, in Schunk, 2012)[19] Further explanation by him, individual internal LOC should be enforced to be developed due to its characteristic never blame others, even related to his either success or failure without blaming others (Rotter, 1966)[17]. This statement supported by Moorhead & Griffin (2010) by stated that individual LOC could be used also in controlling toward some of barriers in his interact with others.[4] In this case, it could be identified that individual LOC can be observed.

In addition to this, Mullins (2010) & Colquitt et.al. (2017) explained that individual in such organization has a characteristic which influenced by his or her failure or success to do job. If he or she failed to do the right thing then if she blame it was because of her or his boss as a cause of her failure, theoretically called, she or he has an external self-control or locus of control.[8, 11] Reversely, somebody called has an internal locus of control if she will blame herself to be caused of anything failure she found and this is better individual characteristic required if environment could be saved appropriately. The same opinions given by Ivancevich, et.al. (2014) by stating that individual self-control could interact with the environment where she spend her own lives.[12] Newstrom (2015) viewed that someone which internal LOC would be never blame other people regarding with his or her successful or failures at working place. These characteristic will influence his career, motivation, beliefs, perception, attitudes, and finally his behavior which called work-attitude, including personality as well. [13]. This statement also supported by Gibson (2012)[9] and Moorhead & Griffin (2010).[4]

None of research results found, however, so far, related to the examination of relationship between gender equality with ecosystem knowledge and students locus of control.

II. RESEARCH METHODOLOGY

The objective of this research was to find out the information regarding with gender equality which affect the differences in students' NEP, ecosystem knowledge and internal-external self-control (LOC Therefore, an ex-post facto used by selecting randomly 362 students from three big city in Indonesia. For collecting data, students' NEP measured by 46 items (all valid), it had reliability was .87 Knowledge (17 items, with rel. was .72) and students' self-control also consisted of 17 items with rel. was .63.

All instruments developed on the basis of theories and it has been validated their construct validity, especially for NEP dimensions derived from Dunlap (2008)[5] that consisted of 5 dimensions namely limiting growth (coding factor was $X1.1$, $X1.2$, and $X1.3$), rejecting-anthropocentrism (code: $X2.1$, $X2.2$, $X2.3$), unbalanced of nature (code: $X3.1$, $X3.2$, $X3.3$), anti-exemptionalism ($X4.1$, $X4.2$, $X4.3$), and rejecting bio-crisis (code: $X5.1$, $X5.2$, $X5.3$).

Students self-control, in this case used locus of control instrument was measured by two choices which would indicate the students tendency whether they tend to be internal or external control by using 2-1 scoring.[21] True-false method used to measure students' knowledge about ecosystem with 1-0 scoring.

In order to do a comparative analysis, the data have been verified by t-test and especially for students' NEP, it has been validated by applying factor analysis based on gender.

III. RESEARCH FINDINGS AND DISCUSSIONS

Considering statistical analysis, it found that gender did not affect significantly on those of three variables namely students' knowledge about ecosystem, locus of control (LOC), and students NEP. It supposed to be brought about by teaching and learning process, but it requires further scientific research dealing with to what extent educational process affect gender equality. It could be seen from table 2 below that there was only slight difference of students NEP, Knowledge about ecosystem (eco) and students' self-control, internally or externally based on students' gender.

For NEP, female students was better than male students, followed by knowledge (eco), but for LOC mean, male students was higher than female. It meant that for LOC, male students was more internal LOC than Female. However, these varieties were not supported by significant verification empirically which probably due to educational role tend to be gender equality (more details in Idowu, 2013)[21]

These findings might be similar to generalization proposed by Irish (2004)[16] and Sasvari, et.al. (2010)[18] which stated that "based on the statistical results (see table 2) male and female have similar demands of natural resources.

A. Tables 1. Descriptive Statistic

	Gender	N	Mean	Std. Deviation	Std. Error Mean
NEP	Female	119	253.6218	20.67095	1.89490
	Male	243	251.9259	21.51788	1.38037
LOC	Female	119	32.8403	1.79917	.16493
	Male	243	33.0494	1.62802	.10444
ECO	Female	119	12.4874	2.36810	.21708
	Male	243	12.1152	2.33264	.14964

B. Tables 2. Independent Sample Test

In term of factor analysis, especially for students NEP, it was interesting results have been found. Based on tables below showed that female students NEP tended to be higher in internal consistency which indicated by its factors loading.

C.Tables 3. Total Variance Explained (Male Students Data)

If it is observed table 4 above indicated that there were three components found based on its eigen-value which have higher than or equal to 1.00. [7] Therefore it could be rotated empirically.

It was surprising that factors such as factor X.1.1, X.1.2, X.2.2, X.3.1. and X.3.3 confirmed NEP factors which consisted of totally from these factors was 25 items, should be omitted from the NEP instrument due to lower its factor loading than standard minimum of .300.[7]

Comparing with female students NEP as a result of confirmatory factor analysis (see table 3 & 4), those findings (male students NEP) was rather close to confirm theoretical framework which supported by empirical findings due to only two factors have lower factor loading than .300 criteria, those factors were X.1.1 and X.5.3) based on two components derived from its eigen-value.

Whatever results found from this study, it was better compare to what have been found by some researchers dealing with gender equality related to NEP. According to Arcury & Christianson, 1990; Blaikie, 1992, and Maineri, et.al, 1997, which quoted by Zeleny (2000)[22] stated that "those findings supported by their findings in term of gender affected people environmental views which stated that women was better in NEP compared to men. However, gender did not significantly affect their environmental concerns.

D.Tables 4. Total Variance Explained (Female Students Data)

IV. CONCLUSIONS

A generalization could be stated based on those research results that education has a vital role, in this case, in affecting students' gender equality. Therefore, these findings could not be implied that gender equality affect students' knowledge about ecosystem, locus of control and NEP. However, in measuring students NEP, female students NEP has a tendency toward a uni-dimensional and produce higher internal consistency rather than male students NEP.

From these results, it might be too earlier to state that education has a vital role for students to be more oriented into gender equality, it is still required further research. Nevertheless, NEP could be more narrower concept which reflected an ecological paradigm rather than used a broader term, environment (Dunlap, 2008).[5]This is a preliminary research which could be implied for policy makers that environmental education is still required for student in facing then industrial revolution 4.0 challenges to minimize the ecosystem destruction continuously.

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