

Validating Locus of control and Its Relation to Knowledge about Ecosystem Based on Students Gender: A Comparative Analysis

I Made Putrawan*

* Mathematics and Science Faculty, State University of Jakarta, Indonesia

Abstract- Education has a vital role in development of any country in the world. Part of it is teaching and learning process which involving two very basic actors, teachers and students. It has been admitted that the success or fail of human development determined by their personality. This is a trait which will influence human behavior. One of the important aspects of human personality, according to some of Organizational Behavior text books, is called locus of control (LOC) which its measurement initiated by Rotter (1978), but for Indonesian students still need to be validated. Theoretically, it determines knowledge, then indirectly affect on behavior (Blaikie, 1993). How to develop and validating LOC instrument and its relation to student's knowledge about ecosystem based on students gender is the objective of this study. Therefore, a survey method has been conducted in three different big cities, Palembang, Jakarta, and Makassar which involving senior high school students with total $n = 362$. Some LOC indicators developed based on its conceptual definitions, with two-forced choice item (17 items) by 2-1 scores. Student's knowledge about ecosystem instrument consists of 17 items as well with "true-false choices." Research results reveal that there is no significant difference between male and female students LOC and knowledge about ecosystem. Only one item of LOC is not valid and all knowledge items are valid. Reliability of LOC instrument is .705, but low reliability found on knowledge, .402. These findings come up with conclusion that students LOC could be validated empirically and students LOC could be used to predict students' knowledge about ecosystem, both for male and female students which supposed to, finally, determine students responsible behavior in facing environmental issues.

Keywords: Locus of control, two-forced choice, validity, and reliability

I. INTRODUCTION

Human ignorance is one of human weaknesses where education has a vital role to eradicate such kind of people sickness. It tends to be one of barriers when development tried to be achieved its goals effectively. Hence, in a small step, teaching and learning would be beneficial in overcoming human ignorance. Therefore, human knowledge would be strengthened by teaching and learning at school in preparing students to face any problems in society, especially students attitude and behavior toward environmental issues or ecosystem (Putrawan, 2014). It could be influenced by one of personality aspects, such as locus of control which hypothetically determine human

knowledge and finally affect directly to human intention to act dealing with human responsible environmental behavior (in Hines, et.al.1986, modified by Blaikie, quoted by Putrawan, 2014).

Related to knowledge, Hegel stated that scientific knowledge and human thinking in general, is a change process from Think-In-Itself, into Think-For-Us, from the nature of materials into something useful for us. It means that what has been not understood at one stage will be explainable.

Bloom (1981) then described that knowledge involved the description about situation focusing on recalling about ideas, objects and other phenomena. Based on its aspects, He also classified knowledge into three groups (1) knowledge about facts and terms, (2) knowledge about problem solving which consist of knowledge about classification, methods, categorical, trends, etc. and (3) knowledge about principles, theory and criteria.

Anderson and Krathwohl (2002) have contributed in developing new dimensions which they called as "a cognitive process." It consists of (1) knowledge about fact (2) knowledge about concepts; (3) knowledge about procedural, and (4) metacognitive knowledge. Structurally, it is close to what has been developed by Bloom (1981), but analytical and synthesis pattern of thinking have been integrated into analytical thinking and they put final process with what they called "creation."

Related to this study, knowledge about ecosystem is one of the variables, therefore, knowledge about ecosystem means all things that relevant to ecosystem concepts which consist of food chain concepts, energy, limiting factors, and biogeochemical cycles. Based on definition as define by Odum (2005), ecosystem is an interrelated and interaction among abiotic and biotic components in natural or artificial system, functionally and structurally. Those components are inseparable because if one component be destructed, then it would be followed by other components destruction. This is a basic principle of ecosystem, so balancing in nature and put human being as part of ecosystem are some of indicators in measuring environmental paradigm.

II. LITERATURE REVIEW

Knowledge about ecosystem would be presumably lead to changes in human attitudes and finally direct his/her behavior, but it depends mostly on how human being view this world comprehensively. According to Bengen (2002), in order to utilize natural resources and its ecosystem rationally, it requires human efforts in conserving biodiversity and try to avoid its

crisis and destruction by applying environmental regulations, laws, and policies which environmentally and sustainability sound.

Locus of control, according to Rotter (1978 in Schunk, Pintrich, and Meece, 2008:224), refers to social learning theory.” Basically, locus of control describe about control location in individual personality related to its environment. Then, Rotter (in Schunk, Pintrich, and Meece, 2008:244) differentiate locus of control orientation into internal and external locus of control. An individual with internal locus of control internal tend to perceive that skill, ability, and effort are more as determinant factors related to what they have got in their life.

On the other hand, an individual with external locus of control tend to perceive that their life determined by the power from outside of them such as faith, luck or someone else which has the power. Therefore, it could be concluded that internal locus of control is much better than external locus of control, because as what predicted by Rotter (in Friedman & Schustack, 2002), external locus of control tend to be dependent and getting easier to become depression and stress and more defensive or passive when they face stressors.

Greenberg & Baron (2010, p.146) defined that “locus of control is the extent to which individuals that they are able to control things in a manner that affects them.” Moreover, Robbin & Judge (2013) stated that in organization, an individual with internal locus of control tend to (1)more taking part actively in running the organization; (2) has more clear in doing jobs; and (3) tend to choose decentralized organization.

On other occasion, McShane & Glinow (2015) stated that “locus of control refers to a generalized belief about the amount of control people have over their own lives” In organization, according to George & Jones (2012) describe that individual with internal locus of control is easier to be motivated than external locus of control. Individual with internal locus of control does not require a lot of direct due to their beliefs that work behavior affect good performances, well paid, compensation, reward and even promotion. Those explanation supported by Kinicki and Kreitner (2011, p. 133) which stated that “people who believe they control the events and consequences that affect their lives are said to possess an internal locus of control.”

More detail explanation proposed by Certo & Certo (2012 and also in Robbins, 2015) which stated that locus of control is someone beliefs about his/her behavior and when it is depended on events in side control of him/herself called internal control orientation or depended on events that occurred at outside of individual control called external control orientation.

However, for both LOC and students knowledge about ecosystem, there is no evidence that these two variables are related to gender equality. It has not been found yet whether male students is closely tend to be more internal LOC or reversely.

III. METHODOLOGY

This study is aim at obtaining information regarding students locus of control validation and its influence on knowledge about ecosystem based on gender. To achieve this objective, a survey method has been applied and 362 senior high

school students from three big cities, Palembang, Jakarta, and Makassar, has been selected randomly as a sample.

There were two instruments used for this study, locus of control instrument consisted of 17 items and has been developed based on Rotter (1978) technique which each item concerns with two “forced-choice” by 2-1 scoring. A statement which related to internal locus of control (LOC) scored with 2, on the other hand, 1 score given to external LOC. Based on analysis, it was found that only item number 6 was not valid and LOC reliability found .705, after not valid item was omitted. In order to be easier in measuring both variables, table of specification below could be helpful to understand its content validity (Anastasi, 2002)

Table1. Students Knowledge about Ecosystem Blueprint (Odum, 2005)

	Concepts of Ecosystem	Interaction	Energy Flow	Nutrients Cycles and Limiting Factors
Knowledge Dimensions				
Knowledge about Facts		1,2,3,4	5,6	7,8,9
Knowledge about Principles		10,11,12	13	14,15

Table 2. Locus of Control Blueprint

No	Indicators	Items Number
1	Recognize your own fault	1, 2, 3
2	Effort in self development	4,5,6,7
3	Feel self weaknesses	8.9.10, 11
4	Never blame someone else due to your fault	12, 13, 14
5	Self love belonging	15, 16, 17

Instrument measuring students knowledge about ecosystem consisted of 17 items as well and all items were valid, but its reliability was low (.402). However, both instrument could be implemented and data was analysed by descriptive statistics, K-R 21, and correlational analysis verified by t-test.

IV. RESULTS AND DISCUSSION

Based on descriptive statistics analysis, it is found that the average of LOC and student sknowledge about ecosystem is high with low standard error (see table 3 below). It means that sample has high homogeneity.

Table 3. Descriptive Statistics Analysis Results

		ECO	LOC
N	Valid	362	362
	Missing	0	0
Mean		12,2376	32,9807
Std. Error of Mean		,12339	,08864
Median		12,0000	34,0000
Mode		12,00	34,00
Std. Deviation		2,34761	1,68656
Variance		5,511	2,845
Skewness		-,439	-2,412
Std. Error of Skewness		,128	,128
Kurtosis		-,059	6,815
Std. Error of Kurtosis		,256	,256
Range		13,00	10,00
Minimum		4,00	24,00
Maximum		17,00	34,00
Sum		4430,00	11939,00

When those two variables be correlated, it is found that students LOC significantly has a positive correlation with students knowledge about ecosystem (.315, $p < .01$, see table 4 below). It could be interpreted that knowledge about ecosystem determined by students LOC (its contribution to knowledge around 63%), especially by students internal LOC, because the higher students LOC scores means that the higher their knowledge would be due to they have internal LOC orientation.

Table 4. Correlations Matrix

		LOC	ECO
LOC	Pearson Correlation	1	,315**
	Sig. (2-tailed)		,000
	N	362	362
ECO	Pearson Correlation	,315**	1
	Sig. (2-tailed)	,000	
	N	362	362

** P < .01

Table 5 below depicts a descriptive statistics analysis result when male and female students analyzed separately in order to verify whether gender equality affect students LOC and students knowledge about ecosystem as well.

Table 5. Descriptive Statistics LOC and Eco Male vs Female Students

		ECO_ Male	LOC_ Male	ECO_ Female	LOC_ Female
N	Valid	119	119	243	243
	Missing	124	124	0	0
Mean		12,4874	32,8403	12,1152	33,0494
Std. Error of Mean		,21708	,16493	,14964	,10444
Median		13,0000	34,0000	12,0000	34,0000
Mode		14,00	34,00	12,00	34,00
Std. Deviation		2,36810	1,79917	2,33264	1,62802
Variance		5,608	3,237	5,441	2,650
Skewness		-,564	-2,216	-,389	-2,537
Std. Error of Skewness		,222	,222	,156	,156
Kurtosis		-,055	5,199	,003	8,033
Std. Error of Kurtosis		,440	,440	,311	,311
Range		10,00	8,00	13,00	10,00
Minimum		6,00	26,00	4,00	24,00
Maximum		16,00	34,00	17,00	34,00
Sum		1486,00	3908,00	2944,00	8031,00

Based on table 5 above, it is found that means difference between male and female LOC students is only below 1.00, ie. .209 (equal variances) and for knowledge, means difference is .372 as well. These results are an indication that there is no significant means differences between male and female students, both for students LOC and knowledge about ecosystem (t-cal. only 1.071 for LOC and 1.419 for knowledge at .05 level). It could be interpreted that gender equality did not affect students LOC and knowledge about ecosystem. The same result was found also by Venus (2011) related to people New Environmental Paradigm (NEP) and gender.

As reported above that students LOC has a positive correlation with knowledge about ecosystem, but if correlation analysis conducted separately between male and female students, it is found that both correlation is positive and significant (see table 6 and 7 below). For male students LOC and knowledge about ecosystem (ECO), it is found that its correlation coefficient is .367 ($p < .01$). Compare to Male students, for female students, its correlation is .297 ($p < .01$).

Table 6. Correlations Male Students LOC and Knowledge (ECO)

		LOC_ Male	ECO_ Male
LOC_ Male	Pearson Correlation	1	,367**
	Sig. (2-tailed)		,000
	N	119	119
ECO_ Male	Pearson Correlation	,367**	1
	Sig. (2-tailed)	,000	
	N	119	119

**P < .01

Table 7. Correlations Female Students LOC and ECO

		LOC_ Female	ECO_ Female
LOC_ Female	Pearson Correlation	1	,297**
	Sig. (2-tailed)		,000
	N	243	243
ECO_ Female	Pearson Correlation	,297**	1
	Sig. (2-tailed)	,000	
	N	243	243

**P < .01

Therefore, based on those results, it could be interpreted that gender equality affect the gratitude of correlation between male and female students related to LOC and Knowledge, but its correlation has similarity, the same significantly and positive direction. The only differences are on its contribution to students knowledge variances, male students contribute around 73.4 % (square of correlation .367) and female students only 59.4 % (square of .297). Nevertheless, male or female students LOC could be determinant factor on students knowledge about ecosystem empirically.

V. CONCLUSION

Some conclusions could be derived based on those research findings as follows,

1. Students LOC could be validated, then implemented scientifically based on Rotter (1978) instrument development, even though its reliability .705, means that around 49 % (square of .705) respondents felt that LOC instruments was reliable.
2. Students gender equality did affect LOC and knowledge correlation coefficients, therefore both male and female students, knowledge about ecosystem could be predicted by students LOC. They have similar linear correlation positive direction which means that if students knowledge about ecosystem would be improved, students LOC could betakenintoconsideration as well.
3. There is no evidence that there is means difference between male and female students, neither for LOC nor knowledge about ecosystem. In this case, it could not be stated that gender equality affect students LOC and knowledge. Since gender equality occured at school setting, the role of education, in a specific term, the role of teaching and learning presumably could be taken into account. In a wider setting, it is better to more understand the position of each country dealing with its gender index where Indonesia (2012) is in rank 32 among 86 countries and the first rank occupied by Argentina with close to zero index means that there is no discrimination treated between men and women in this country.

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AUTHORS

First Author – I Made Putrawan, Professor, State University of Jakarta, email: putrawan.imade@yahoo.com