Contribution Information Literacy of Teachers' Empowering Eight (E8) Model toward Learning based on Industrial Revolution 4.0 at State Junior High School of Siak District

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Abstract Information literacy is smart obligation for teachers in facing Industrial Revolution 4.0, because all education institutions should have good preparation to face it. This research aims to describe and analyse learning degree based on Industrial Revolution 4.0, information literacy degree of teachers' empowering eight (E8) model. Correlation information literacy from teacher's empowering eight (E8) model toward learning based on industrial revolution 4.0 in Public Junior High School in Siak Region. This is descriptive quantitative survey research. The population of this research was 120 teachers. The sample of this research was 89 teachers. The formula in taking samples was taken from Isaac and Michael Table (1982). The margin error of this research was 5 percent. Data Collection was taken from five choice questionnaires and it analised by using descriptive statistics and inferencial statistics. The research findings stated that learning degree based on industrial revolution 4.0 was very high. The mean was 4.62. Information literacy degree of teachers' empowering eight (E8) model considered as very high too. The mean was 4.57. Correlation between information literacy from teacher's empowering eight (E8) model and learning based on industrial revolution 4.0 were 0.655. The influences among variables were 43.00 percent (medium category). This findings explained that information literacy from teacher' empowering eight (E8) model can increase the teachers' activities in learning process based on industrial revolution 4.0. It stated that if the teachers' information literacy were better, the learning process which were done by them also will be better.

Keywords: learning, *industrial revolution, literacy, teacher.*

1. Introduction

In facing the industrial revolution 4.0, educational institutions especially teachers who have self-existence in global competition must prepare the mental and skills that have competitive advantage. The easiest way to prepare skills is by having behavioral attitude, increase self-competence and having a literacy spirit. The capital of self-preparation can be passed through with long life education path and self-concept through the experience of working across generations and across knowledge and science disciplines. Gates (1996) stated that education is in the domain of knowledge age with an extraordinary acceleration of knowledge increase. This era is called the 21st century, and education is increasingly important to ensure students have the skills to learn something and innovate other thing, having skills to use technology and information media, having skills to work, and survive by using life skills.

The Indonesian Ministery of Education and Culture adapted 3 education concepts in 21st Century to develop new curriculum in each degree. They are: *21st Century Skills* (Trilling dan Fadel, 2009), *scientific approach* (Dyer, *et al.*, 2009) dan *authentic assesment* (Wiggins dan McTighe, 2011);

Ormiston, 2011; Aitken dan Pungur, 1996; Costa dan Kallick, 1992). The 21st Century Education Concept is adapted to develop Indonesian Creative Education 2045. The adaptation is also used to achieve apropriate concept with the students' capacity, teachers and staff competency in running learning process of the education.

The challenges of the Industrial Revolution 4.0 occur in aspects of information technology security, reliability and stability of production machines, human resource skills and innovation, and the occurrence of automation that reduces employment (Sung, 2017). Then, Yahya (2018) grouped the challenges of the Industrial Revolution 4.0 into five aspects: (1) economic, (2) social, (3) technical, (4) environmental, and (5) regulation. These five aspects for universities, inevitably have to be ready to face it.

The Indonesian Minister of Education and Culture, Muhadjir Effendy (2018) responded to the era of the Industrial Revolution 4.0 by designing curriculum, through five competencies that were formed in making learning standards, namely: (1) critical thinking; (2) creative and innovative; (3); communication skills (4) working together and collaborating; and (5) have confidence. The competency is a necessity, where the ability to think critically is expected to occur in the process of teaching, and followed by the creativity of students so that they have creative and innovative abilities.

In facing the industrial revolution 4.0 does not necessarily make everyone, especially teachers, have readiness, but it is inevitable. Teachers in implementing learning must be based on revolution 4.0 in various ways and strategies, including by increasing information literacy skills (Leftheriotis, & Giannakos, 2014). Between the information literacy it is necessary to practice the empowering eight (E8) literacy of the many literacy models in mingling with the industrial revolution 4.0 when learning. According to UNESCO (2014) in Wahyuni (2016) the definition of literacy was again used and developed again in the *Education for All 2000 Assessment where Literacy is the ability to read and write with understanding a simple statement related to one's daily life. It involves a continuum of reading and writing skills, and often includes also basic arithmetic skills (numeracy).*

One of the information literacy capabilities that is important for teachers in dealing with the industrial revolution 4.0 in learning is the literacy *Empowering Eight* model. The Empowering Eight as an information literacy model was developed by Wijetunge (2005). Information literacy according to the Empowering Eight model (Wijetunge, 2005 and Wijetunge, 2009), that information literacy consists of the ability to: (1) identify topics / subjects, target audiences, relevant formats, types of sources; (2) exploration of sources and information relevant to the topic; (3) selection and recording relevant information, and collecting appropriate quotations; (4) organization, evaluating and organizing information in a logical order, distinguishing between facts and opinions, and using visual aids to compare and contrast information; (5) information creation using own words, editing, and making bibliography; (6) presentation, dissemination / display of information produced; (7) assessment of outputs, based on input from others; and (8) application of inputs, assessments, experiences gained for future activities; and the use of new knowledge gained in various situations.

2. Methodology

The research purpose is to describe and analyze the level of learning based on the Industrial Revolution 4.0, and the level of Information Literacy Teachers' Empowering Eight (E8) Model, as well as the relationship and influence of information literacy on the Teachers' Empowering Eight (E8) Model with learning based on Industrial Revolution 4.0 at the State Junior High School in Siak District. This quantitative descriptive research was conducted with a survey consisting of two main

variables, namely information literacy in the Teachers' Empowering Eight (E8) Model (X) and Learning based on the Industrial Revolution 4.0 (Y).

The population was 120 teachers and the research sample was 89 teachers. The margin error was 5 percent. The instrument test was conducted on 20 teachers who did not become research samples. Data were collected using a questionnaire with five choices and the data were analyzed using descriptive statistics to find the level of learning based on the Industrial Revolution 4.0 and information literacy of the Teachers' Empowering Eight (E8) Model by looking for average values and inferential statistics to find relationships and the magnitude of contributions between variables .

Learning based on the Industrial Revolution 4.0 is the teacher's opinion toward their competence in conducting learning related to the industry revolution 4.0. The information literacy of the Teachers' Empowering Eight (E8) Model is the teachers' point of views about their activities in carrying out literacy in relation to their work based on the Empowering Eight (E8) Model.

3. Result and Discussion

3.1. Descriptive Statistical Analysis

The results of descriptive data analysis of learning variables based on the Industrial Revolution 4.0 are as in the following table:

Tabel 1: Mean Score dan Standard Deviation of Learning Variables based on Industrial Revolution 4.0 (Y) based on each Indicator

No	Indicator	Mean	SD	Interpretation
1	Thinking Criticaly	4,72	0,55	Very High
2	Creativity	4,61	0,57	Very High
3	Communication Skills	4,70	0,58	Very High
4	Collaboration	4,48	0,62	Very High
5	Self Confidence	4,59	0,59	Very High
Averages		**4,62**	**0,58**	**Very High**

Table 1 above explains that the mean score (indicator average score) for learning variables based on the industrial revolution 4.0 is 4.62. This shows that learning based on Industrial Revolution 4.0 in the State Junior High School in Siak District based on each indicator is very high. However, it still needs an increase in the lowest indicator, namely collaboration, which is a mean of 4.48 and a Standard Deviation of 0.58.

The results of descriptive data analysis toward variables Information Literacy of Teachers' Empowering Eight (E8) Model are as in the following table:

Tabel 2: Mean Score and Standard Deviation form Variables Information Literacy of Teachers' Empowering Eight (E8) Model based on each indicator

No	Indicator	Mean	SD	Interpretation
1	Identification	4.61	0.59	Very High
2	Exploration an appropriate sources	4.68	0.57	Very High
3	Selection and Information Record	4.61	0.59	Very High
4	Organization, evaluation and arrange	4.35	0.75	High

	information			
5	Creation	4.31	0.65	High
6	Presentation	4.65	0.62	Very High
7	Assessment	4.65	0.62	Very High
8	Implementation	4.68	0.59	Very High
Avarages		**4.57**	**0.62**	**Very High**

Table 2 above explains that the mean score (average indicator score) for the information literacy variable of teachers' the empowering eight (E8) model is 4.57. This shows that the information literacy of the teachers' empowering eight (E8) model in the Siak District Public Junior High School based on each indicator is already very high. However, it still needs an increase in the lowest indicator, namely the creation of a mean 4.57 and a Standard Deviation of 0.62.

3.2. Inferential Statistical Analysis.

The results of data analysis using inferential statistics can be explained as follow:

Tabel 3: Correlation Test Pearson between Information Literacy of Teachers' Empowering Eight (E8) Model toward Learning based on Industrial Revolution 4.0.

Variable	n	Pearson Correlation	Sig (2-tailed)
X-Y	89	0,655**	0,000

**, Correlation is significant at the 0.01 level (2-tailed)

Based on Table 3 about the Pearson correlation test between information literacy of the Teachers' Empowering Eight (E8) Model on learning based on the industrial revolution 4.0, the Pearson correlation of 0.655 is obtained, indicating that there is a significant relationship between the information literacy of the Teachers' Empowering Eight (E8) Model towards learning based on the industrial revolution 4.0. The correlation between the information literacy of the teachers' empowering eight (E8) model to learn based on the industrial revolution 4.0 is quite strong in interpretation, this is indicated by the correlation score is very far from the number 1.0. With P value / Sig equal to 0.000 <0.05. So, it can be concluded that there is a significant relationship between the two variables.

Based on table 4 about the t test below, the information literacy variable of the empowering eight (E8) model of learning based on the industrial revolution 4.0, that obtained a = 1.542 and b = 0.674 so that the regression equation becomes Y = 1.542 + 0.674 so that the regression equation can be interpreted that the relationship both of these variables are significant and linear. This means that every 1 number increase in the information literacy variable of the teachers' empowering eight (E8) model will be followed by an increase in the industrial revolution-based learning of 1,542 numbers.

Tabel 4: t Test Calcualtion Coeffecient Variabel Information Literacy of Teachers' Empowering Eight (E8) Model toward Learning Based on Industrial Revolution 4.0

Model	B	T_{test}	t_{table}
(Constant)	1,542	4,062	1,4534
Information Literacy Empowering Eight (E8)	0,674	8,094	

a. Dependent Variabel: Learning based on Industrial Revolution 4.0 Y

From table 4 also the coefficient obtained t test score (t-test) is 4.062 while the score of t table is 1.4534 or it can be said tcount> ttable, this means Ho is rejected and Ha is accepted so there is a significant contribution between the information literacy contributions of the teachers' empowering eight (E8) model towards learning based on the industrial revolution 4.0 at the State Junior High School in Siak District. The hypothesis that there is a contribution to the information literacy of the teachers' empowering eight (E8) model towards learning based on the industrial revolution 4.0 at Public Junior High School in Siak District was accepted.

Based on testing the hypothesis which states that the results of the data are accepted, it is also necessary to know how much the contribution of information literacy is the teachers' empowering eight (E8) model to learning based on the industrial revolution 4.0 in the State Junior High School in Siak District. For this matter can be explained in the following table:

Tabel 5 : Contribution Variables Information Literacy of Teachers' *Empowering Eight* (E8) Model toward Learning based on Industrial Revolution 4.0.

R	R Square	Sig, F Change	Influence (%)	Interpretation
0,655[a]	0,430	0,000	43,00	Sedang

a. Predictors: (Constant): X Information Literacy Empowering Eight (E8)Model
b, Dependent Variable: Y Learning based on Industrial Revolution

Table 5 above explains the information literacy of the teachers' empowering eight (E8) model will be followed by an increase in learning based on the industrial revolution 4.0, it can be seen the Pearson Product Moment correlation between variables contributing information literacy to the teachers' empowering eight (E8) model towards learning based on the industrial revolution 4.0, in the State Junior High School in Siak District is 0.655. Based on the correlation value, it is obtained R Square (r2) = 0.430 or 43.00%, meaning that the contribution of information literacy to the teachers' empowering eight (E8) model to learning based on the industrial revolution 4.0 in the Siak District State Junior High School is 43.00% , while the remaining 57.00% is determined by other factors not part of this research. It can be concluded, that the influence of the information literacy variable of the empowering eight (E8) model of teachers on learning based on the industrial revolution 4.0 at the State Junior High School in Siak District is of moderate interpretation or the effect is classified as moderate.

The results of this research have a significant relationship between the information literacy variables of the teachers' empowering eight (E8) model towards learning based industrial revolution 4.0 in the State Junior High School in Siak District with a contribution of 43.00% with moderate interpretation because there is still 57.00% determined by other factors not part of this research. This contribution is illustrated by each increase in one point of information literacy variable of teachers' empowering eight (E8) models will be followed by an increase in learning based on the industrial revolution 4.0 1, 542 point. The findings of this research are strengthened by research conducted by Agustina (2018), concluding that the opportunity for decentralization of development and ease of access to information is higher in the industrial revolution 4.0, and allows various interest groups to communicate and develop their innovations. one of the forms of solving those problems is social innovation . Social innovation has existed so far, but the effort can be improved in quality and variety by utilizing 4.0 technology innovations such as *cloud, IoT,* and others. This study will discuss starting from: (1) What are the opportunities for social innovation in the industrial revolution era 4.0; (2) How is the development of social innovation that utilizes innovation 4.0 in Indonesia? The development of the 4.0 industrial revolution formed a cyber-physical system that allowed machines to help various kinds of human work. In addition, there are also cyber-social systems that facilitate human interaction using

machines. In this case it is closely related to social innovation that has an impact on the development of ideas and efforts.

Yahya (2018) said that industry 4.0 brought many changes in human life. Industry 4.0 has fundamentally changed the way people do activities and has a big influence on the world of work. The positive influence of industry 4.0 is in the form of the effectiveness and efficiency of resources and production costs despite the impact on reducing employment. Industry 4.0 needs a workforce that has skills in digital literacy, technological literacy, and human literacy. Education must be able to equip graduates with all three literacy through revitalization of the chronosystem which includes learning systems, education units, students, and educators as well as education staff.

Muntashir (2016) found that the information literacy ability of students today is very important to their academic success, supporting them to adapt and compete in the world of work. Existing competency standards can be developed for students through various programs. The program can be applied in various ways ranging from information literacy instruction programs organized by libraries both online and in class.

Weaver & Pier's research is strengthened by a survey conducted by NACE (National Association of Colleges and Employers) in 2017 indicating that as many as 67.5% of students have low communication skills. Low communication skills can affect the ability to process information, difficulty integrating thoughts and speech, and difficulty adapting to the environment (Wood & Hartshorne, 2017). Furthermore, the results of Purvis, Mc Neill, & Sutherland (2014) research at the University of New Zealand found that about 67% of students have low literacy. Students' interest in academic speaking and reading activities is categorized as low. The low interest of students is because students are more easily carried by the flow of global information. Today's students easily trust information in cyberspace without checking the source or the truth of that information. Students are lazy to find information that comes from trusted sources and like searching information sites that are found to be more practical. Although the acquisition of information today is more practical but it is unfortunate that students are less sensitive to the credibility of information sources. Therefore, information technology literacy is also needed to improve students' communication skills.

One of the information literacy capabilities that is important for teachers in facing the 4.0 industrial revolution in learning is the Empowering Eight literacy model. The Empowering Eight as an information literacy model was developed by Wijetunge (2005) which began at the International Workshop on Information Skills for learning. , Malaysia, Nepal, Pakistan, Singapore, Sri Lanka, Thailand, and Vietnam, while the second workshop was held in Patiala India) November 2005. The aim is to develop an information literacy model that will be used for Southeast and South Asian countries. The developed model is called Empowering Eight or E8 because it includes 8 components of finding and using information.

Information literacy according to the Empowering Eight model (Wijetunge, 2005 and Wijetunge, 2009), that information literacy consists of the ability to: (1) identify topics / subjects, target audiences, relevant formats, types of sources; (2) exploration of sources and information relevant to the topic; (3) selection and recording relevant information, and collecting appropriate quotations; (4) organization, evaluating and organizing information in a logical order, distinguishing between facts and opinions, and using visual aids to compare and contrast information; (5) information creation using own words, editing, and making bibliography; (6) presentation, dissemination / display of information produced; (7) assessment of outputs, based on input from others; and (8) application of inputs, assessments, experiences gained for future activities; and the use of new knowledge gained in various situations.

This finding is also supported by the mean value of information literacy of the empowering eight (e8) model based on each indicator being well interpreted in the medium category and the mean value of 4.57 and the standard deviation of 0.62. This finding explains that based on the information literacy indicator of the empowering eight (e8) model of teachers in the State Junior High School of Siak District is already good with a very high category. These findings are illustrated by the identification, exploration of appropriate sources, selection and recording of information, organization, evaluation and compilation of information, creation, presentation, assessment and application. While the indicator of learning based on the industrial revolution 4.0 obtained a mean value of 4.62 and a standard deviation of 0.58 with a very high interpretation. Research by the German Chancellor, Angela Merkel (2014) believes that Industry 4.0 is a comprehensive transformation of all aspects of production in the industry through the merger of digital and internet technology with conventional industries. Schlechtendahl et.al, (2015) emphasizes the definition of the speed element of information availability, namely an industrial environment in which all entities are always connected and able to share information with each other. Empowering Eight Literacy when done correctly and well by teachers, is believed to be able to improve the ability of teachers in learning based on the industrial revolution 4.0 which includes: (1) critical thinking; (2) creative and innovative; (3); communication skills (4) working together and collaborating; and (5) have confidence. This means that the better the information literacy of the Empowering Eight (E8) model is done by the teacher, the better the learning based on the industrial revolution 4.0 they do.

4. Conclusion

Significant contribution was obtained between the contribution of information literacy to the empowering eight (E8) model of teachers, towards learning based on the industrial revolution 4.0 in the State Junior High School in Siak District with a influence of 43.00% with very high interpretation, because there were still 57.00% determined by other factors that were not part of this study. This influence is illustrated by each increase of one unit in the information literacy variable of the empowering eight (E8) model of the teacher will be followed by an increase in learning by the industrial revolution 4.0 by 1.542 one unit. This means that the teacher is able to increase information literacy of the empowering eight (E8) model together to achieve the desired goals by, (1) critical thinking; (2) creative and innovative; (3); communication skills (4) working together and collaborating; and (5) have confidence.

Based on the influence of information literacy on the model of empowering eight (E8) teachers on learning based on the industrial revolution 4.0 in the State Junior High School in Siak District, the school through the principal's policy can increase activities that are improving teachers' views on information literacy of the empowering eight model (E8) in a way, (1) critical thinking; (2) creative and innovative; (3); communication skills (4) working together and collaborating; and (5) have confidence.

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