

CRITICAL PEDAGOGY IN THE ERA OF THE INDUSTRIAL REVOLUTION 4.0 TO IMPROVE DIGITAL LITERACY STUDENTS WELCOMING SOCIETY 5.0 IN INDONESIA

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Abstract

Society 5.0 is a condition of society that is integrated with technology. This is closely related to the 4.0 industrial revolution which is also known as the disruption era. This reality is both a challenge and an opportunity for educators as part of society 5.0 in improving the quality of education as a vehicle for building a critical, cultured, creative, and futuristic generation. Based on these thoughts, the long-term objective of this study is to build futuristic pedagogical competencies. The specific target of this research is to find a pedagogical best practice to increase students' digital literacy in the digital era in welcoming society 5.0 in Indonesia. The research model used in this study is a mixed-methods research model. The sample of this research is students of the University of Pendidikan Indonesia in the semester I with 25 respondents. The research instrument was the test material (pretest-posttest) and semi-structured interview guidelines. From the data analyzed, that the significant value of $0.000 < 0.050$ (H_0 is rejected). This shows that the mean pretest score is significantly smaller than the average posttest score. In line with this, the results of the interviews show that students are more careful with information obtained from the internet after treatment in learning. In other words, the application of a critical pedagogic model has an impact on improving students' digital literacy.

Keywords: Critical Pedagogy, Industrial Revolution 4.0, Digital Literacy

Abstrak

Society 5.0 merupakan kondisi masyarakat yang terintegrasi dengan teknologi. Hal ini terkait erat dengan revolusi industri 4.0 yang juga dikenal dengan era disrupsi. Realitas ini sekaligus menjadi tantangan sekaligus peluang bagi pendidik sebagai bagian dari masyarakat 5.0 dalam meningkatkan kualitas pendidikan sebagai wahana membangun generasi yang kritis, berbudaya, kreatif, dan futuristik. Berdasarkan pemikiran tersebut maka tujuan jangka panjang dari penelitian ini adalah membangun kompetensi pedagogik futuristik. Sasaran khusus dari penelitian ini adalah menemukan best practice pedagogis untuk meningkatkan literasi digital mahasiswa di era digital dalam menyambut masyarakat 5.0 di Indonesia. Model penelitian yang digunakan dalam penelitian ini adalah model penelitian metode campuran. Sampel penelitian ini adalah mahasiswa Universitas Pendidikan Indonesia semester I sebanyak 25 responden. Instrumen penelitian berupa tes materi (pretest-posttest) dan pedoman wawancara semi terstruktur. Dari data yang dianalisis diperoleh nilai signifikansi $0,000 < 0,050$ (H_0 ditolak). Hal ini menunjukkan bahwa rata-rata skor pretes secara signifikan lebih kecil daripada rata-rata skor postes. Sejalan dengan hal tersebut, hasil wawancara menunjukkan bahwa siswa lebih teliti dengan informasi yang diperoleh dari internet setelah dilakukan perlakuan dalam pembelajaran. Dengan kata lain, penerapan model pedagogik kritis berdampak pada peningkatan literasi digital siswa.

Kata Kunci: Pedagogik Kritis, Revolusi Industri 4.0, Literasi Digital

INTRODUCTION

Society 5.0 or better known as society 5.0 is a concept initiated by the Japanese government. According to Skobelev & Borovik (2017), the concept of society 5.0 seeks to

solve social problems with the help of the integration of physical and virtual spaces, not just a manufacturing problem. Integration between technologies from big data, IoT, and Artificial Intelligence occurs in Society 5.0 (Rokhmah, 2019; Özdemir, 2018). This further emphasizes the concept of technology that seeks to facilitate human life for the better (Mathews, 2019). The more rapid development of technology in Indonesia indicates that Indonesia is welcoming a society 5.0.

Indonesia is one of the largest countries in internet usage. According to the Indonesian Internet Service Providers Association (APJII), in 2018 the total number of internet users in Indonesia reached 171.17 million people. Then in 2020, there are 196.71 million internet users in Indonesia from a total population of 266.91 million people (APJII, 2020). The internet is in demand by almost everyone in the world because, with the internet, all information in digital form can be accessed easily. The internet as a result of the development of the digital world provides all the facilities for accessing information or communicating. However, the development of the digital world does not always have a positive impact, such as easy access to information, but the development of the digital world presents challenges related to the development of digital literacy. The impact of rapidly advancing internet technology has and will change the pattern of human life (Ancok, 2000; Setiawan, 2018).

The challenge, in this case, relates to the large number of young people accessing the internet. It cannot be denied that the younger generation from elementary to tertiary age have the ability to access the internet. Most of them spend their time accessing the internet, in various forms such as games, social media, e-commerce, etc. Based on the results of the study, most of them access the internet for 5 hours per day, so this raises concerns. Based on data, Indonesian children's access to pornographic content per day reaches an average of 25 thousand people. Another challenge is the large number of unhealthy internet behavior which is shown by the prevalence of fake news or hoaxes, hate speech, and bullying (Kemendikbud, 2017). This challenge characterizes the low level of digital literacy skills, especially for students at every level of formal education as the young Indonesian generation.

Digital literacy is defined as the ability to understand and use various forms of information from various sources through electronic devices (Bawden, 2010; Lee, 2014; Kurnianingsih, 2017). Meanwhile, according to Gilster (1997), digital literacy is the ability to understand and use information obtained from various sources in any form that is accessed via a computer. From some of these understandings, it is concluded that digital literacy is a skill in which a person can receive, understand, disseminate and use information from a computer or

internet device. Given the challenges of using the internet today, an understanding of digital literacy skills needs to be added to the ability to sort old and factual news based on trusted sources and demonstrate positive internet behavior by avoiding bullying, avoiding access to pornographic content, and other challenges. which has been mentioned. This challenge needs to be faced by parents and educators who have an important responsibility and role in preparing Indonesia's young generation in the 21st century which is very important to have digital competence.

Based on the data presented, many challenges must be faced in the current digital era. This challenge shows the low level of digital literacy in Indonesia. However, this challenge is not an excuse to shut out all developments in the digital world. Today, even though the internet presents challenges for educators and parents, students still need the internet because the growth of today's young generation coincides with the development of the digital world. The two cannot be separated, because digital literacy skills need to be improved so that existing challenges can be minimized. Also, with the increase in digital literacy, internet users, especially students in Indonesia, can optimize the benefits of advancing the digital world properly.

Digital literacy for students needs to be improved through a critical pedagogical paradigm, namely digital student learning. As is known, pedagogy is the science of how to educate and humanize humans based on theory, philosophy, psychology, sociology, and other humanities principles (Hendriani, et al., 2018). Critical pedagogy examines education more deeply, according to Theilin (2005), critical pedagogy is not about the polemic of teacher knowledge in the classroom. Critical pedagogy involves students sharing responsibility when experiencing problems based on their experiences in dealing with social realities from existing problem conditions. According to Freire (2008), critical pedagogy does not want the idea that students are active listeners but rather critical researchers who collaborate with teachers in obtaining learning.

Based on these two expert statements, it can be concluded that critical pedagogy, focuses on the teacher's ideas in learning by placing students as a learning center to gain knowledge, not just how teachers teach and students only listen. In critical pedagogy, the goal is not only limited to students being able to think critically but has a goal to create a more democratic and humanist society, namely by preparing individuals who have critical awareness, are aware of problems, identify causes, take action. and uphold ethics and morals. (Robandi, 2018).

Critical pedagogy deals with how students can become individuals who can survive problems that arise in the social reality around them. One of the problems in question is the problem in the current digital era. The challenges of the digital age that were mentioned earlier are problems that need to be resolved by students.

Efforts to overcome problems that arise in the digital era can be done with a critical pedagogy based on digital learning, namely learning using digital media such as blogs, social media, applications that facilitate virtual learning, etc. Digital learning is used because of the problems in this case. Learning is a low level of digital literacy, therefore digital learning will be contextual to this problem. This study aims to examine relevant sources or literature regarding critical pedagogy based on digital learning as an effort to increase digital literacy.

METHOD

The research model used in this study is a mixed-methods research model. The mixed-methods model is a research model that is applied when the researcher has questions that need to be tested in terms of outcomes and processes and involves a combination of quantitative and qualitative models in one study. The division of types in mixed methods research can be divided into four, namely embedded, explanatory, exploratory, and triangulation types (Cresswell, 2007). Of the four types of research design above, the author prefers to use an explanatory type design.

The subjects of this study were students of the University of Education of Indonesia who contracted basic education subjects. The sample selection was carried out by random area sampling. The quantitative data produced in this study are data related to the proposed hypothesis, namely students' literacy abilities. Meanwhile, qualitative data is generated from in-depth interviews and finding the meaning of the answers obtained to confirm the findings of the quantitative data.

RESULTS AND DISCUSSION

In this study, critical pedagogy is an educator's point of view in designing learning to be more meaningful. In learning, researchers apply three methods. First, contextual learning. In its implementation, educators strive to present an environment that is relevant to the lives of students. Second, learning about problems. Students are invited to find issues that are relevant to lecture content and reflect on them. Third, dialogue. Educators build a learning environment

that is comfortable and interwoven with mutual trust so that students intrinsically enjoy expressing opinions and asking questions during each lecture process.

Results

1. Descriptive Statistics

Table 1. Descriptive Statistics

Statistik	Pretest	Posttest
<i>n</i>	25	25
\bar{x}	51,08	56,04
Min.	41	50
Mak.	57	60
s^2	3,85	2,65
<i>s</i>	14,82	7,04

Table 1. Descriptive Statistics. gave information about 25 respondents that the average value of the digital literacy level was higher posttest than pretest. Then the posttest digital literacy score interval is wider than the pretest. Meanwhile, the standard deviation and variance of the pretest digital literacy values were higher than the posttest literacy values.

2. Normality Test

The normality test aims to determine whether data is normally distributed or not, in other words, data from samples that have been taken come from the same population. The normality test in this study was assisted by the SPSS for Windows program with a significance level of 5%. The normality test is carried out with the following hypothesis.

H_0 : sig. > $\alpha=0,05$ (normally distributed data).

H_1 : sig. < $\alpha=0,05$ (data is not normally distributed).

The statistical normality test using SPSS produces the Kolmogorov-Smirnov and Shapiro-Wilk statistical tests which are presented in the Normality Test Table.

Table 2. Test of Normality

	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	Df	Sig.	Statistic	Df	Sig.
Pretest	.105	25	.200*	.952	25	.280
Posttest	.134	25	.200*	.959	25	.395

*. This is a lower bound of the true significance

a. Lilliefors Significance Correction

Based on the Test of Normality Table. The significant value of Kolmogorov-Smirnov pretest was $0.200 > 0.050$ (H_0 accepted) and posttest control class $0.200 > 0.050$ (H_0 accepted). These results indicate that the pretest data and posttest data are normally distributed. This shows that the normal data assumptions are fulfilled as a prerequisite for parametric statistical analysis.

3. Homogeneity Test

The homogeneity test aims to determine whether the data variance is homogeneous or not, in other words, the data from the samples that have been taken come from the same population. The normality test in this study was assisted by the SPSS for Windows program with a significance level of 5% where the results of the normality test with the hypothesis testing were as follows.

$H_0 : \sigma_1^2 = \sigma_2^2$ or sig. $> \alpha=0,05$, (both variances are homogeneous).

$H_1 : \sigma_1^2 \neq \sigma_2^2$ or sig. $< \alpha=0,05$, (both variances are not homogeneous).

The data homogeneity test using the Levene Statistic test is presented in the Test of Homogeneity of Variance Table.

Table 3. Test of Homogeneity of Variance Score

Levene Statistic	Df1	Df2	Sig.
3.955	1	48	.052

Based on the Test of Homogeneity of Variance table. significant value Levene Statistic Posttest = $0.052 > 0.050$ (H_0 accepted). These results indicate that the data before / pretest and data after / posttest have a homogeneous variation. This shows that the assumption of homogeneous variance data is fulfilled and can be analyzed parameterically.

4. Hypothesis Testing (Paired sample t-test)

After fulfilling the assumptions to perform parametric testing, a paired sample t-test is performed. This is to determine the effect of implementing a critical pedagogic model on improving student digital literacy. With the following hypothesis.

$H_0 : \mu_1 = \mu_2$ or sig. $> \alpha=0,05$, (the average pretest results are the same as the average posttest results)

$H_1 : \mu_1 < \mu_2$ or sig. $< \alpha=0,05$, (the average pretest class results are smaller than the average posttest results)

The paired sample t-test was conducted through SPSS for Windows with a 95% confidence level presented in the Paired Samples Correlations Table and the Paired Samples Test Table.

Table 4. Paired Samples Correlations

	N	Correlation	Sig.
Pair 1 Pretest & Posttest	25	.306	.137

In the Paired Samples Correlations Table. shows a correlation value of 0.306, which means that the pretest and posttest data have a positive relationship. When the value of digital literacy is initially higher, literacy after learning will increase.

Table 5. Paired Samples Test

	Paired Differences				t	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference			
Pair 1 Pretest - Posttest	- 4.96000	3.95264	.79053	- 6.59157 3.32843	-6.274	24	.000

Paired Samples Test Table. provides information that a significant value of $0.000 < 0.050$ (H_0 is rejected). This shows that the mean pretest score is significantly smaller than the average posttest score. The application of a critical pedagogic model has an impact on improving students' digital literacy.

5. Qualitative Data

The implementation of critical pedagogic-based learning has an impact on student knowledge regarding the use of digital information media. With this knowledge, they use digital information media to find assignments, watch k-pop, short films, motivational vlogs, search for recipes, cook tutorials, find song lyrics and so on (Sa3, 78, 81; So4, 33, 39; Er3, 148-150). This is in line with Supratman (2018, p. 52) who explains that digital natives use social

media to get information, communicate virtually, explore hobbies, get entertainment, support lecture assignments, carry out online learning, and adopt fashion styles and lifestyles. Meanwhile, if you look at the social media owned by students, there is data that students are active in using various social media, such as WhatsApp, Facebook, Instagram, Twitter, YouTube, and TikTok (NNA1, 34; GN2, 15; So4, 18; Sa3, 84 ; Er3, 35). Social media itself is an intermediary on the internet that allows users to present themselves and interact, collaborate, share, communicate with other users virtually (Nasrullah, 2015). According to Sanggabuwana and Andrini (2017, p. 172) there are various kinds of social media, ranging from social networks (Facebook, Linked-In, Whatsapp, Line, Instagram), personal social networks (yammer, social cast, jive), content sharing sites. (Youtube, flicker), to wiki blogs (Wikipedia) (blogger, word press), and micro blogs (twitter). The use of social media by students is considered quite wise, they use social media as a place to interact, socialize, find information, and share information. Social media as a place to promote something, stalking instastory, reading threads on twitter, entertainment, sharing information about sexual harassment and information (NNA1, 36-37; So4, 19, 27, 28, 31; GN2, 18-21; So4 , 36; Er3, 94; Sa3, 41-42). Online learning itself can be defined as an activity or teaching and learning process carried out by teachers and learners by utilizing internet networks and digital information media. Therefore, the application of online learning is expected to improve students' digital literacy competencies. Student digital literacy is the ability to understand and use information in various forms from a very wide variety of sources (Paul Gilster, 1997). Students seek, process, and double-check information by utilizing digital media such as google, google scholar, Garuda portal, and youtube as sources of information (NNA1, 42; So4, 46; Er3, 134, 142; Sa3, 156-158; GN2 , 23).

Discussion

Literacy skills in the era of the industrial revolution 4.0, not only emphasize reading, writing and numeracy skills, but also emphasize the importance of digital literacy skills, technological literacy, and human literacy (Suwardana, 2018; Yahya, 2018, pp. 13-14) .

These competencies or skills need to be built and accustomed to. This habit can start from the classroom in lectures. Efforts to build this habit need to go through specific approaches to learning. Furthermore, Hobbs (2018) formulates practical digital literacy instructions in education. Hobbs starts from the first, getting used to recording activities in using media. By making it a habit to take notes in using the media, it allows students to evaluate and build

awareness in their habit of looking for and sharing information. Second, develop strategies in finding, evaluating and sharing content that is relevant to your needs. Third, interpret reading texts actively and make correlations in life. Fourth, get used to being careful and encourage students to ask questions critically in representing an issue and understanding the goals of the author. Fifth, invites students to compare two similar texts, by analyzing them based on genre, purpose, form and content. Sixth, engaging in fun activities with the aim of building imagination, creativity and decision-making skills, and consequences. Seventh, get used to creating messages with message composition using a combination of language, pictures, sound, music, interactive special effects so as to provide a real experience. As well as being able to collaborate in solving problems.

Learning is an interaction between students, students with educators, students with learning resources in a learning environment. According to Nurwati (2009) the interaction process plays a very important role in social dynamics and increased achievement. The interactions that occur are carried out in order to convey messages in the form of knowledge that must be mastered by students through the learning process so that their behavior changes in a positive direction. Social interaction develops over time. The role of technology also changes the way humans interact socially. The Industrial Revolution 4.0, which is an era of digital transformation and an era of disruption, the role of educators in conveying knowledge (transfer of knowledge) can be replaced by digital technology so that educators can optimize their role in guiding, motivating, directing, and facilitating students during learning. Learning in the era of digital transformation which is an era of disruption will be very dangerous for students if educators do not practice learning with compassion and love by always trying to find out their needs, providing something useful and needed, and trying to make them independent.

CONCLUSION

Critical pedagogy is not limited to making participants think critically in class, but also provides the knowledge and skills needed by students to expand their competence or capacity. That is, critical pedagogy not only trains students to think critically in the classroom, but also aims to form a democratic and humanist society by preparing individuals (students) who are full of critical awareness, sensitive to problems, can identify problems and take action. to solve problems and uphold ethics and morals.

Digital literacy is not limited to accessing and using digital media only. However, it is more about how internet users, users of digital sophistication use their thinking so that they are critical of what they get from digital sophistication. Therefore, through digital-based critical pedagogical learning will be able to foster digital literacy skills.

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