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Fostering student's critical reading through technology integrated instruction

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ABSTRACT

Students today grow up with technology devices at home and school, which transform how they study. Future education technology will alter teaching and learning by making new gadgets available to teachers and students. Thus, the study was meant to explore the impact of multimedia technology-integrated instruction on upper primary students' critical reading learning in one of Indonesia's private schools. To further comprehend the outcomes, a mixed methods study was conducted. Purposive sampling was used to choose 30 pupils as research samples. For three months, the participants were taught at least three science sessions per week utilizing multimedia technology. Instruments such as open-ended questions and questionnaires were used to collect data. The quantitative results from the questionnaire were examined and inferred using an inferential statistical t-test and descriptive statistical mean and standard deviation with a significance level of p 0.05. The qualitative data from open-ended questions were analyzed using the grounded theory coding technique. According to the findings, students were incredibly satisfied with learning science through multimedia technology because it made the lessons easier to grasp and more likely to engage, easy, and interesting. As a result, the researchers concluded that introducing multimedia technology into education had a considerable positive influence on raising student learning satisfaction and improving critical reading skills The post-test scores in the group that utilized multimedia technology are noticeably higher when the two groups are compared.

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1. Introduction

According to the British Council, there were roughly 1.5 billion English language learners (ELLs) in the globe in 2014. (Bentley, 2014). The remaining 375 million ELLs were learning English as a second language (ESL), while 750 million were learning English as a foreign language (EFL). (Lake & Beisly, 2019). Learning higher-order literacy abilities like meaning inference, reading comprehension, and writing is one of the most challenging tasks for ELLs (Prior et al., 2014). As computer technology has evolved and internet access has grown more accessible, educational technology apps have become effective instruments for improving the literacy development of ELLs (Lee et al., 2022). To learn English, students must focus on four skills: speaking, reading, writing and listening. According to (Heilman, 1961), reading is a complex process involving the mechanical processes of correctly pronouncing words and also recognizing meaning, which is influenced by the reader's attitudes, knowledge, and past experiences. By enhancing their reading skills, students will

make significant gains in all aspects of their education. Reading is recognized as a talent that influences the process of mastering other subjects.

According to Wigfield and Asher, (1983), reading proficiency is a factor in academic success because of the value placed on lengthy assignments in textbooks and reference materials. Students with strong reading skills can expand their vocabulary understanding, improve their word pronunciation, hone their writing skills, and select the needed information from the texts they are reading. Reading is the practice of actively discovering information through comprehending textual material that is stated explicitly or implicitly. In addition, reading is an activity that helps readers comprehend what they have read. Grabe, (2003) asserts that reading comprehension is the primary purpose of reading. Understanding requires not only literal word-by-word translation, but also comprehension of the material. Critical reading, a higher degree of reading, requires the reader to examine, interpret, and evaluate the text after comprehending it. Peters, (1991) defines critical reading as the application of criticism to the act of reading. Students should be able to read communications, assess and evaluate texts according to predetermined quality standards. Analyzing and then synthesizing the material is the general definition of critical reading. Students must construct arguments based on their interpretation of the text's primary points. It will aid students in illuminating key themes and anticipating what may be written next, so enhancing their comprehension of textual content. Critical reading is distinct from general reading since this level of reading is challenging, especially in a foreign language. In order to strengthen students' critical reading skills, it is recommended that they share and debate their opinions in order to determine the correct response. This student-student interaction is likely a component of cooperative learning, one of the reading strategies. Kagan et al., (2019) assert that the cooperative learning strategy gives methods for organizing group work by increasing student contact and mutual learning motivation. Cooperative learning's success is attributable in part to its foundation in social interdependence theory and the clear operational procedures that enable and promote its implementation in the classroom (Johnson & Johnson, 2013). In addition to providing a number of approaches that can be employed to pique students' interest, the cooperative learning strategy enables teachers to assess their students' progress in learning English by evaluating their unique abilities.

Over the past few decades, several ways to teach a second or foreign language have been proposed, including the Audio-Lingual Method, Communicative Language Teaching, Content-Based Language Teaching, and Task-Based Language Teaching, among others. These methods typically concentrate on successfully developing students' communicative competence and teaching language skills. Still, they are less successful at capturing the language and language acquisition's social and political complexity(Okazaki, 2005). Many teachers believe that as students get older and obtain more experience in various knowledge disciplines by reading at school or university, they will naturally develop critical thinking and critical reading skills. Critical reading and thinking abilities are also required for the study. To write a decent summary of a reading passage, students must contain adequate information, identify key ideas, and be suitably specific or generic. They must also monitor how they read the paragraph, arrive at a mental summary, verify it with the source text, write the overview, and compare the written summary to the source material. Critical reading is a reading process that involves critical thinking. Thus, defining critical reading and self-corrective thinking necessitates understanding the meanings of reading and critical thinking. Recent theories see reading as a mechanism that extracts meaning from a document and links knowledge in the document with the knowledge the reader brings to the reading act (Grabe, 1988). Due to critical analysis skills, they become conscious of the hidden meaning within different kinds of text. The text's awareness is also essential so that no one can mistreat or use their' lack associated with knowledge' for some daunting purpose. The literate individual cannot be exploited, and nobody can determine their thoughts. Critical reading is necessary to compare, analyze, and assess the difference when this happens. Since critical thinking is commonly considered an important factor of reading, so it is typically stressed and taught in language classrooms, especially in reading classes.

Phillip (2016) claimed instructors' teaching beliefs and the external environment were the most significant elements in their use of technology. Environment, external stimuli, internal beliefs, and skills were identified by Merritt et al., (2012) as elements influencing teachers' use of IT-integrated instruction. Jimoyiannis (2010) divided information technology factors in instruction into internal factors of teachers' information literacy, i.e., the ability, attitudes, and beliefs in using information

technology, and external factors of those within the teachers, such as sufficient time for instructional plans, adequate information technology equipment, good computer technology training, and full administrative support. Furthermore, Arcega (2010) identified the importance of instructors' information technology skills. The management of technology resources and the knowledge and skills of IT-integrated instruction were named as the factors of IT-integrated instruction by (Hechter & Vermette, 2013).

In the past three decades, technology integration has been a continuous effort among educators and education researchers (Hechter & Vermette, 2013). Over 35,000 articles and abstracts have been written about technology integration in education, analyzing current practices, advocating effective strategies, and reorganizing policy. Most articles discuss the nature of classroom technology. There are two sorts of barriers to using technology in the classroom, according to Ertmer, (2005), external barriers, such as resources, training, and support, and internal barriers, such as teacher confidence, beliefs about student learning, and the usefulness of technology in the classroom. Since the article's publication, additional research has examined the hurdles to technological integration (Ertmer, 2005; Pierson, 2001). Arrowood and Overall, (2004) examine teachers' fundamental perceptions. Nevertheless, the technology gap persists.

In addition to professional development, Reading, colleagues, research, and the Internet, teachers can also acquire technological knowledge through these means. Professional development allows teachers to learn from practitioners and professionals currently employing the technology through Master's courses and approved workshops for in-service teachers. Teachers have access to a variety of IT resources for providing pupils with basic exercise and for growing students' critical and nuanced thinking. Implementing and utilizing IT in the classroom improves students' performance. Some teaching-related tools and Web designs have demonstrated the capacity to offer pupils entirely new learning content. Its primary objective is to give students with electronic gadgets for one-to-one learning, sometimes more frequently than getting instruction from teachers (Futrell & Geisert, 1984)

However, teaching according to the game rules results in improved student learning. Students' motivations and desire are increased when they are challenged to achieve specific goals (Futrell & Geisert, 1984). Students gaining knowledge through images of science and technology learn about the process of thinking and reflect on what they can do and what others can do (Futrell & Geisert, 1984). Student learning often entails excellent learning outcomes. Most learners say that they are interested in the learning process, and that learning includes being pleased with the outcomes. Kim and Moore (2005) observed that students are less satisfied with distance learning courses performed solely on remote Web pages without contact since it is harder to receive teachers' attention. Bannert and Mengelkamp (2013) discovered that learners are generally pleased with their use of technology for education.

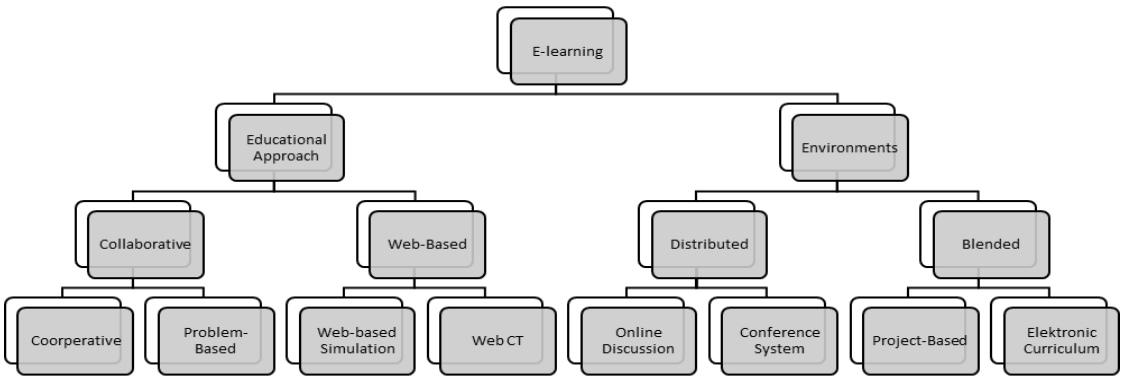

Fig. 1. Taxonomy of Technology Integrated Instruction based on critical reading

Technology Integrated Instruction can be used in two different environments, blended and distributed learning environments. Some researchers propose models for cultivating Critical Reading in these environments, such as project-based and electronic curriculum for blended learning environments and conference systems and online discussions for distributed learning environments.

Furthermore, several approaches, including collaborative learning and web-based, are used in e-learning environments to cultivate Critical Reading.

2. Methodology

This study's research methodology is quantitative. This kind of research is referred to as quasi-experimental because the participants were not chosen at random. This study uses two subject groups—an experimental and a control group. The author primarily divides intact groups into experimental and control treatment groups, and she then carries out experimental treatment activities for the experimental group. Peer review is used in the therapeutic activity, followed by a post-test to evaluate the differences. Creswell and others (2007). Both teams consist of students from the present class (intact group). The selection of the research design was based on how well it suited the setting of the investigation. Because this study is being conducted in a classroom, it is challenging to choose subjects at random. The research participants are thus chosen from already-existing classes or groups on campus. According to Suen and Ary (2014), a research study is limited to using groups from already-existing, intact classrooms and cannot alter the school's schedule or classes. Suen and Ary (2014) also point out that getting a random sample in a school setting is frequently impossible.

This study used a Pretest-Posttest Design with a Nonrandomized Control Group. According to Suen and Ary (2014) this is one of the most often employed quasi-experimental designs in educational research.

Table 1. Nonrandomized Control Group, Pretest-Posttest Design

Group	Pre-test	Independent variable	Post-test
E	A1	X	A2
C	A1	-	A2

Note:
E: experimental group
C: control group
X: treatment (DLC)
-: TII
A1: pre-test
A2: post-test

The table shows that two groups, namely Traditional Teaching and Technology Integrated Instruction, were taught using two different techniques. With the letter X, those techniques are indicated. Meanwhile, moderator variables are shown in letter A and divided into three groups; Y1 represented low critical reading (CR) students, intermediate critical Reading (CR) and Y3 represented high critical reading (CR) levels.

2.1. Data Collection Procedures

To collect the data is needed, the researcher took some steps involving specifying the low, intermediate, and high CR groups, administering pre-test, treatment, and posttest

2.2. Population and Samples

A population is a set of items or individuals, each of which can be assigned values of one or more characteristics (Jobson, 2012). Meanwhile, according to Suen and Ary (2014) the population is all members of any well-defined class of people, events, or objects. This research population is all of the third-semester students of the English Department of teacher training and education faculty of Universitas Ma'arif Nahdlatul Ulama Kebumen. The total population was 60 students. The writer used two classes as the samples of the study. The writer took the sample using Non-random sampling. They were class A and class B. The writer chose class A as the control group and class B as the experimental group. The students' number of class A were 30 students, while class B was 30 students.

2.3. Research Instruments

This study uses pre-test and post-test to measure the students' critical reading skills. The test was given to experimental and control groups. The experimental group was taught using Digital Literature Circle, while the control group was taught using Technology Integrated Instruction. Five instruments of Critical Reading readings were selected from the Critical Reading Work Book for the SAT 12th Edition by (Green & Wolf, 2010). It was divided into three portions, including closed exams and reading comprehension assessments. Section 1 had twenty-five questions, and the participants were allowed twenty-five minutes to answer. Section 2 had twenty-four questions, and participants had twenty-five minutes to answer them. Section 3 had nineteen questions, and participants had twenty minutes to answer them. Texts and critical reading questions were also included in the equipment. The researcher conducts the try-out before administering the test. The purpose of the outcome of the try-out is to measure the validity and reliability of the test. This analysis determines the validity of research instruments using the Pearson Product Moment correlation test. In contrast, the reliability of this study's research instruments is computed using Cronbach's Alpha.

2.4. Validity and Reliability of Critical Reading Test

According to Suen and Ary (2014), it is mentioned that any measuring instrument should have two important characteristics: validity and reliability. In this study, the critical reading test has been constructed to meet the criteria of validity and reliability test

The test's validity was evaluated using a standardized instrument for assessing EFL students' language performance. Once a week, the researchers established eight sessions of explicit teaching and practice of critical reading strategies classes. The participants began the program and continued for ten 90-minute sessions. The participants completed the critical reading pre-test in the first session so that the researchers could understand the participants' early concepts of Critical Reading. This test had twenty-two questions for the participants to answer. Each correct answer received one point under the test scoring procedure. The researcher conducts the try-out before administering the test.

The result of the try-out is aimed at measuring the validity and reliability of the test. The validity of the research instruments in this study is computed using the Pearson Product Moment correlation test. Simultaneously, the reliability of this study's research instruments is computed using Cronbach's Alpha.

3. Findings and discussion

This section will describe the following data: 1) the scores acquired from the multiple-choice content test in the pre-test and post-test; 2) the findings of pre-analysis testing, including the test of normality and homogeneity; and 3) the analysis of pre-and post-test data for hypothesis testing. Based on the questionnaire and test results, this part will also provide a data description of students' critical reading skills level concerning the critical reading teaching technique.

3.1. Data Description of Critical Reading Scores

The Critical Reading scores are those received from the multiple-choice Critical Reading test. Before and after therapy, the Critical Reading test with multiple-choice questions was performed. In this part, just the greatest and lowest scores, the distance or range between them, the mean and standard deviation scores are provided for a concise presentation of Critical Reading scores.

3.2. Pre-test Scores of Students in Traditional Technique and TII Classes

Based on the descriptive statistics analysis of the pre-test results of the students who were taught critical reading using the Traditional Technique , it was discovered that the mean score was 60.2, the standard deviation was 5.42, the range score was 18, the highest score was 69, the lowest score was 51, and the range score was 18. The range score was 22, the mean was 60.1, and the standard deviation was 5.93, while the greatest and lowest pre-test scores of the students who got the TII Technique in teaching critical reading were 70 and 48, respectively. The descriptive statistics summaries for the pre-test results of the students who got Traditional Technique and TII Technique in teaching critical reading.

Table 2. Statistics Pre-Test Scores of Students Who Received TT and TII Techniques

Descriptives				
Technique			**Statistic**	**Std. Error**
Pretest Score	TT	Mean	60,2000	,99007
		95% Confidence Interval for Mean — Lower Bound	58,1751	
		95% Confidence Interval for Mean — Upper Bound	62,2249	
		5% Trimmed Mean	60,2037	
		Median	60,0000	
		Variance	29,407	
		Std. Deviation	5,42281	
		Minimum	51,00	
		Maximum	69,00	
		Range	18,00	
		Interquartile Range	10,00	
		Skewness	,004	,427
		Kurtosis	-1,073	,833
	TII	Mean	60,1000	1,08315
		95% Confidence Interval for Mean — Lower Bound	57,8847	
		95% Confidence Interval for Mean — Upper Bound	62,3153	
		5% Trimmed Mean	60,2407	
		Median	60,0000	
		Variance	35,197	
		Std. Deviation	5,93267	
		Minimum	48,00	
		Maximum	70,00	
		Range	22,00	
		Interquartile Range	7,75	
		Skewness	-,438	,427
		Kurtosis	-,501	,833

Based on the descriptive statistics analysis for the pre-test scores of the students with high Critical reading skills in the class who received the TT Technique in teaching critical reading, it was found that the highest and lowest scores were 68 and 51, respectively; the range was 17, the mean was 58.9, and the standard deviation was 6.29.

The students who had Intermediate critical reading skills had pre-test scores ranging from 53 to 65, with a mean of 58.8 and a standard deviation of 4.51. The range score was 12, the maximum score possible was 65, and the lowest score was 53. The students with low critical reading skills had pre-test scores ranging from 69 to 55, with 14 being the range score, 62.9 being the mean score, and 4.74 being the standard deviation. The following are the summaries of descriptive statistics for the pre-test scores of students who received the DLC Technique in critical reading instruction. These students either had high, intermediate or low critical reading skills.

3.3. Post-test Scores of Students in TT and TII Classes

The descriptive statistics analysis for the post-test scores is obtained from the Critical Reading Test by the students who received the TT Technique in teaching critical reading. It was found that the highest and lowest scores were 91 and 64, respectively, the range score was 27, the mean was 78.7, and the standard deviation was 7.34. Whereas the highest and lowest post-test scores obtained from the multiple-choice content test by the students who received the TII Technique were 75 and 54, respectively, the range score was 21, the mean was 65.06, and the standard deviation was 5.81. The summaries of descriptive statistics for the post-test scores obtained from the critical reading test by the students who received the TT and TII Technique.

Table 3. Statistics Post-Test Scores Obtained From The Critical Reading Test By The Students Who Received TT and TII Technique

Descriptives Statistics					
		Method		Statistic	Std. Error
Posttest Score	TII	Mean		78,7000	1,34091
		95% Confidence Interval for Mean	Lower Bound	75,9575	
			Upper Bound	81,4425	
		5% Trimmed Mean		78,8333	
		Median		78,5000	
		Variance		53,941	
		Std. Deviation		7,34448	
		Minimum		64,00	
		Maximum		91,00	
		Range		27,00	
		Interquartile Range		11,00	
		Skewness		-,200	,427
		Kurtosis		-,927	,833
	TT	Mean		65,0667	1,06127
		95% Confidence Interval for Mean	Lower Bound	62,8961	
			Upper Bound	67,2372	
		5% Trimmed Mean		65,1111	
		Median		65,5000	
		Variance		33,789	
		Std. Deviation		5,81279	
		Minimum		54,00	
		Maximum		75,00	
		Range		21,00	
		Interquartile Range		10,00	
		Skewness		-,099	,427
		Kurtosis		-,953	,833

Based on the descriptive statistics analysis for the post-test scores obtained from the Critical Reading Test by the students with high Critical reading skills in the class who received DLC Technique in teaching critical reading, it was found that the highest and lowest scores were 89 and 64, respectively, the range score was 25, the mean was 80.90, and the standard deviation was 8.17. The highest and lowest scores obtained from the Critical Reading Test by the students with Intermediate Critical reading skills were 86 and 70, respectively. The range score was 16, the mean was 78.4, and the standard deviation was 6.18. The highest and lowest scores obtained from the Critical Reading Test by the students with low Critical reading skills were 91 and 66, respectively. The range score was 25, the mean was 76.8, and the standard deviation was 7.69. The summaries of descriptive statistics for the post-test scores obtained from the critical reading test by the students with high, Intermediate, and low Critical reading skills who received the DLC Technique in teaching critical reading.

From quantitative data analysis of the finding from the post-test with questions, it was found that there was a significant difference in the effect of the TT and TII Techniques on the students with Low Critical reading skills levels. It is found that the value of sig. (2-tailed) was 0.000, which was lower than 0.05. The experimental class that received the TT technique outperformed the control class that received the TII technique. The experimental class students were more interested and challenged by the TII technique they received and enjoyed the TII technique action than the control class students.

As discussed earlier, the TT treatment led to a statistically significant difference favoring the TT group compared to the TII group when all five measures were examined. The statistical results reported in Chapter 4 showed that the TT treatment significantly impacted the critical reading test. The difference between the means score of the TT and TII groups' critical reading post-test scores was statistically significant. Nevertheless, only four out of the thirteen study measures were found to have a statistically significant relationship with the treatment.

Thus, it was clear that the two significant measures contributed the most to the TT's positive main effect. Besides, these two significant measures yielded low CLA effect levels, meaning the observed differences were significant. This result confirmed the initial hypothesis that participation in the TT could build participants. The result of this analysis is then compared with TT and TII in the Critical

Reading Test obtained by the students who received TT Technique was 78.7, whereas the mean score obtained by the students who received TII Technique was 65.06. This finding was also consistent with the findings of other studies, such as Haghparast et al (2014), Yeh (2012), Thompson and Washington (2015), and Spencer (2019), which almost uniformly reported that implementing literature circle activities could lead to an improvement in critical reading ability. The findings verified Case and Daniels' (2002) claims that TII improved reading comprehension and validated my presumption. Inconsistent findings were found in earlier studies on this subject, nevertheless. While some research, like Serena et al. (2020), Zhang et al. (2007), and others, like Certo et al. (2010), McLean and Miller (2010), (Karabulut, 2012), and McElvain (2010), found no improvement in reading comprehension after introducing literary discussions, some studies, like Serena et al. Methodological problems contributed to such unpredictable results. Confounding variables, such as past group differences, may not have been taken into account in the method (Serena et al., 2020), there may not have been a comparison group utilized (Eeds & Wells, 1989), or the reading comprehension growth may have been measured using unreliable assessments. In terms of methodology, linking the observed outcome to the process was also required.

4. Conclusion

Based on the result of data analysis using an independent t-test, it is concluded that applying technology integrated instruction has positively affected students' critical reading skills by covering interpretation, analysis, evaluation, inference, conclusions, and Self-regulation. Students who experience technology integrated instruction tend to comprehend text passages better than those who do not experience it. technology integrated instruction was more effective in teaching critical reading than the traditional technique. The outcome of the t-test demonstrates that the critical value for students who received TT Technique was lower than the mean score attained by the students with high Critical Language Awareness levels who received TII Technique (80.9). Thus, the research's findings prove that using technology integrated instruction to teach critical reading is worthwhile for English teachers and instructors.

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