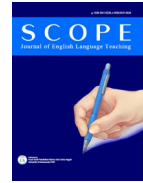




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Integrated Artificial Intelligence and Critical Thinking in Promoting Students' Writing Skills

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KEYWORDS

Artificial Intelligence;
 creative thinking;
 teaching media
 writing skills.

ABSTRACT

This study investigated the effectiveness of integrated teaching media, Artificial Intelligence, and creative thinking in promoting students' writing skills for specific genre, descriptive text. By administering experimental quantitative research with the two-way ANOVA test, the study engaged 60 students at a private junior high school in Bogor, West Java, Indonesia. Based on the research's written test instruments and a set of questionnaires, the data analysis showed a significant effect of artificial intelligence and creative thinking, partially and altogether, on students' writing skills in descriptive text. The results indicated that creative thinking with the support of teaching media in the digital technology world, such as Artificial Intelligence, can bring numerous advantages to educational settings, particularly in English Language Teaching. It delivers new experiences and elevates motivation in learning languages. Due to the digital era, this study endorses advanced technology implementation, including AI, to promote students' critical thinking for better writing performances.

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INTRODUCTION

The English Language Teaching with technology is attempting to reveal how technology influences ELT circumstances. Teaching media as a tool for language teaching has undoubtedly always facilitated the language learning circumstances for both instructed and non-instructed learners. It includes audio, visual, and audio-visual media. Thus, rapid digitalization has challenged educational settings, particularly the ELT environment, to implement a multimodality approach in promoting learners' best practices and output (Magnusson & Godhe, 2019). The digital world challenges do not belong to learners only. However, they challenge the teachers as

well. They cover several dimensions of course knowledge, teaching approach, digital literacy, and student engagement (Seau & Azman, 2021). With comprehensive learning dimensions, best practices and output would appear in this field.

The current digital-based approach, Artificial Intelligence, has been implemented in ELT, particularly in developing learners' writing skills (Hartono et al., 2023). The AI writing media is a digital writing tool that led to the availability of tools and services for writing that have radically reshaped the process of authoring and editing. The AI writing media allows the learning machine to empower students writing skills by providing writing assistance (Marzuki et al., 2023). It reduces the cognitive

barriers learner faces when producing written English text. In this way, AI is a potentially practical tool for English language learners who need more structured assistance than traditional word processors. AI writing media is an emerging field in teaching media, for it has enormous potential for creative thinking in digitalized learning to each learner.

However, the global world also requires learners to think critically and creatively to communicate with others in a collaborative way to construct knowledge and solve problems (Helaluddin et al., 2023). Regarded as the “4Cs” of the 21st century, communication, collaboration, critical thinking, and creative thinking are essential skills that learners must have to keep up with the shifting paradigms of globalized systems (Gursoy & Bağ, 2018). The learner must be able to overcome a variety of modern challenges, and the learner should prepare to be capable of having problem-solving skills, critical thinking, and creative thinking. Consequently, creative thinking becomes a pivotal skill in the digitalized era. Creative thinking is making and connecting links to think and experience various ways of new or unusual possibilities and guides in generating and selecting alternatives (Defianty & Wilson, 2022). Integrating this creative thinking in English language learning would benefit cognitive growth and acquisition ability.

Based on prior descriptions, the study focuses on exploring Artificial Intelligence and creative thinking in students’ writing skills in descriptive text, one of the writing genres at the junior high school level. It is noteworthy to know how significant the effects of teaching media, Artificial Intelligence, and creative thinking are in promoting students’ writing skills in descriptive text. Therefore, this research aims to answer several issues as follows:

1. Is there any effect of teaching media on students’ writing skills in the descriptive text?
2. Is there any relationship between creative thinking and students’ writing skills in the descriptive text?
3. Are there any interaction effects of teaching media and creative thinking on students’ writing skills in the descriptive text?

METHOD

The study conducted an experimental quantitative research design (Creswell, 2012) with two-way ANOVA. Among 604 students in the seventh grade of four private junior high schools in the 2022/2023 academic year in the Bogor district, the research involved 60 students as the participants. The participants were divided into two groups: the experiment class and the control class. The writing media utilized *EssayAiLab*. By administering a multi-step of experiment procedure and applying two research instruments the questionnaire and a test, the study

managed the instruments to all participants. The multi-step procedure covered:

1. Administering measures of the dependent variable or a variable closely correlated with the dependent variable to the research participants.
2. Randomly assigning one member of each pair to the experimental group and the other member to the control group.
3. Exposing the experimental group to the experimental treatment and administering no treatment or an alternative treatment to the control group.
4. Administering measures of the dependent variables to the experimental and control groups.
5. Comparing the performance of the experimental and control groups on the post-test using tests of statistical significance.

Meanwhile, the questionnaire consisted of 30 questions and covered five aspects of curiosity and exploration, creative self-efficacy, beliefs about creativity, creative activities in the classroom, and social environment. Moreover, the test included six components of content, organization, discourse, syntax, vocabulary, and mechanics, ranging from one to four and noted as poor to excellent. Though, the experiment of Artificial Intelligence and creative thinking were integrated and applied to the experiment class, while the control class utilized a conventional approach.

RESULTS AND DISCUSSION

The results appear based on tests and questionnaires from 60 participants. The validity and reliability tests revealed valid and reliable results. With 30 questions, the validity test applied the Pearson Product Moment and resulted in a valid instrument, as seen in Appendix 1. Meanwhile, the study administered a reliability test with Cronbach’s Alpha and showed a reliable instrument, as seen in Figure 1. All measurements were supported by the SPSS 20.

Cronbach's Alpha	N of Items
.914	30

Figure 1. Reliability Test

Moreover, by applying a statistical analysis of two-way ANOVA, the collated data describes information as seen in Figure 2.

	A1	A2	B1	B2	A1B1	A1B2	A2B1	A2B2
N Valid	30	30	30	30	15	15	15	15
Missing	30	30	30	30	45	45	45	45
Mean	19.90	18.57	19.73	18.73	19.87	19.93	19.60	17.53
Median	20.00	18.50	20.00	19.00	20.00	20.00	19.00	18.00
Mode	21	18 ^a	19	18 ^a	18 ^a	19	19	18
Std. Deviation	1.269	1.455	1.285	1.574	1.457	1.100	1.121	.915
Minimum	18	16	18	16	18	18	18	16
Maximum	22	22	22	22	22	22	22	19

a. Multiple modes exist. The smallest value is shown

Source: Authors (2023)

Figure 2. Descriptive Data of the Results

Descriptions:

- A1 : AI writing media
- A2 : Conventional writing media
- B1 : High creative thinking
- B2 : Low creative thinking
- A1B1 : Students' writing with AI and high creative thinking
- A1B2 : Students' writing with AI and low creative thinking
- A2B1 : Students' writing with conventional media and high creative thinking
- A2B2 : Students' writing with conventional media and low creative thinking

1. Significant Effect of Teaching Media on Students' Writing Skills

The results for experiment group present the score of mean is 19.90 with standard deviation is 1.269, median is 20.00 mode is 21, maximum score is 22 and minimum score is 18. The instrument test consists of 25 items with score maximum each question is 5. In contrast, the results for conventional group show score of mean is 18.57 with standard deviation is 1.455, median is 18.50, mode is 18, maximum score is 22 and minimum score is 16. The instrument test consists of 25 items with score maximum each question is 5.

The calculation performed the significant score through the Statistical Package for the Social Sciences (SPSS) version 20. It shows that the significance for teaching media is $0.000 < 0.05$, and the F_{count} is 19.649. Hence, there is a significant effect of learning media on students' writing skills in descriptive text.

The result of this research is in line with previous study that revealed teaching media promotes students' writing skills; and creates a positive impact on making them more critical and productive (Ghafar et al., 2023). Moreover, teaching media brings several benefits to the teacher, such as delivering educational material, promoting students' creativity, and improving students' attention during the learning process. It functioned to communicate gaps between the teacher and students, also assisting the teacher

to explain concepts better, which enhances the teaching and learning process.

From the explanation above, AI writing media is an effective teaching medium for improving students' writing skills, and the use of teaching media in learning descriptive text can enhance positive effects for students. AI can be applied at every level of education and in any subject of learning circumstances (Bearman et al., 2022). It carries out simplicity, fast understanding, and even builds learners' competence in specific subjects.

2. Relationship between Creative Thinking and Students' Writing Skills

Based on Figure 1, data on experiment and control groups with high creative thinking shows score of mean is 19.73 with standard deviation is 1.285, median is 20.00, mode is 19, maximum score is 22 and minimum score is 18. The instrument test consists of 25 items with score maximum each question is 5. Oppositely, data on low creative thinking expresses score of mean is 18.73 with standard deviation is 1.574, median is 19.00, mode is 18, maximum score is 22 and minimum score is 16. The instrument test consists of 25 items with score maximum each question is 5.

The calculation performed the significant score through the Statistical Package for the Social Sciences (SPSS) version 20. It shows that the significance for creative thinking is $0.002 < 0.05$, and the F_{count} is 11.053. Hence, there is a significant relationship between creative thinking and students' writing skills in descriptive text.

The result of this research is relevant to a prior study that stated creativity is one of the language skills, and among the elements of language teaching, writing and creativity are the ones closely interlinked (Sopiani et al., 2019). The study evidenced that there are six levels of instructions to promote students' writing creativity, namely: remembering, understanding, applying, analyzing, evaluating, and creating. When students own the levels of creativity, they don't need any intervention to boost their creativity. Furthermore, writing skill reflects a thinking tool for language to creativity development. Consequently, creativity can produce students with innovative, communicative, collaborative, and creative writing skills.

The explanation above indicates that owing high creative thinking helps students create better writing in descriptive text. The aspect is related to students' self-motivation to reach their learning goals and targets (Banegas & Lowe, 2021). Creative thinking delivers an enormous influence on students' writing in descriptive text.

3. Teaching Media and Creative Thinking on Students' Writing Skills

After approving single effect and the relationship of each variable, the analysis continues to the interaction effect of altogether variables. The interaction effect based on the experiment group with high creative thinking shows score of mean is 19.87 with standard deviation is 1.457, median is 20.00, mode is 18, maximum score is 22 and minimum score is 18. The instrument test consists of 25 items with score maximum each question is 5. The results are in line with the low creative thinking that reveals score of mean is 19.93 with standard deviation is 1.100, median is 20.00, mode is 19, maximum score is 22 and minimum score is 18. The instrument test consists of 25 items with score maximum each question is 5.

However, in control group with conventional media, the results display lower score than the experiment group. The group with high creative thinking expresses score of mean is 19.60 with standard deviation is 1.121, median is 19.00, mode is 19, maximum score is 22 and minimum score is 18. The instrument test consists of 25 items with score maximum each question is 5. Thus, in line with the low creative thinking group that shows score of mean is 17.53 with standard deviation is 0.915, median is 18.00, mode is 18, maximum score is 19 and minimum score is 16. The instrument test consists of 25 items with score maximum each question is 5.

The calculation performed the significant score through the Statistical Package for the Social Sciences (SPSS) version 20. It shows that the significance for teaching media and creative thinking is $0.001 < 0.05$, and the Fcount is 12.575. Hence, there is a significant relationship between creative thinking and students' writing skills in descriptive text.

The result of this research is in accordance with the preceding studies that identified teaching media and creative thinking ability in learning as very influential in promoting writing skills (Iskandar et al., 2022; Scharlau et al., 2021). Both variables lead students to catch up with the learning transformation from the conventional era to the digital world. The level of creative thinking and the support of AI as teaching media influence significant differences in students' writing skills. Furthermore, due to the correlation between creativity and writing skills with AI media, students with high creativity tend to show great curiosity and create a wide range of creations and ideas to try and find creative ideas. In this way, the ideas are unstoppable.

In addition, because there are significant interaction effects of teaching media and creative thinking towards students' writing skills in the descriptive text at private junior high schools in Bogor, the Tukey test is needed to be examined. The Tukey test with multiple comparisons was examined through the SPSS version 20. The results are displayed in following Figure 2.

Multiple Comparisons

Dependent Variable: Students' Writing Skill

Tukey HSD

(I) Post Hoc	(J) Post Hoc	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
A1B1	A1B2	-.07	.425	.999	-1.19	1.06
	A2B1	.27	.425	.923	-.86	1.39
	A2B2	2.33*	.425	.000	1.21	3.46
A1B2	A1B1	.07	.425	.999	-1.06	1.19
	A2B1	-.33	.425	.862	-.79	1.46
	A2B2	2.40*	.425	.000	1.27	3.53
A2B1	A1B1	-.27	.425	.923	-1.39	.86
	A1B2	-.33	.425	.862	-1.46	.79
	A2B2	2.07*	.425	.000	.94	3.19
A2B2	A1B1	-2.33*	.425	.000	-3.46	-1.21
	A1B2	-2.40*	.425	.000	-3.53	-1.27
	A2B1	-2.07*	.425	.000	-3.19	-.94

Based on observed means.
 The error term is Mean Square(Error) = 1.357.
 *. The mean difference is significant at the .05 level.

Source: Authors (2023)

Figure 2. Tukey Test

The Tukey test revealed some pivotal points. First, in the group of students who were taught by AI writing media (A1), it is found that there is no significant difference in students' writing skills in descriptive text among students who have high creative thinking (B1) and students who have low creative thinking (B2). It is proved by the score of significance $0.999 > 0.05$.

Second, in the group of students who have high creative thinking (B1), it is found that there is no significant difference in students' writing skills in descriptive text among students who were taught by AI writing media (A1) and students who taught by conventional media (A2). It is proved by the score of significance $0.923 > 0.05$.

Third, in the group of students who have low creative thinking (B2), it is found that there is a significant difference in students' writing skills in descriptive text among students who were taught by AI writing media (A1) and students who taught by conventional media (A2). It is proved by the score of significance $0.000 < 0.05$.

The last, in the group of students who were taught by conventional media (A2), it is found that there is a significant difference in students' writing skills in descriptive text among students who have high creative thinking (B1) and students who have low creative thinking (B2). It is proved by the score of significance $0.000 < 0.05$.

It is true that teaching media, either conventional or technology-integrated, can support classroom lessons because their effectiveness in helping students to connect language to reality cannot be underestimated (Brown, 2022). The explanation above indicates that when the teacher applies good teaching media, it will deliver a good impact or improve students' writing skills in descriptive text.

CONCLUSION

Based on the previous sections, it can be said that the aspects of teaching media and creative thinking, partially or comprehensively, influence writing skills significantly. The use of AI writing media motivates the students to write text. This is because AI writing media delivers new experiences to students and helps the students be open-minded and express their ideas in writing due to the role of assistant. Additionally, creative thinking, whether high or low, will not impact writing skills when students are encouraged by impressive teaching media. Therefore, teachers should know the capacity of students' creative thinking individually. Students with low creative thinking should receive intensive treatment from the teacher to improve their creative thinking. However, it is difficult for teachers to have an individual approach. Therefore, this study suggests teachers catch up with the digital world for the abandoned teaching media. In this borderless era, students' enrichment with various teaching media, especially media based on digital technology, is required for the best student outcome. Further study is needed for different subjects and deeper analysis. In this way, the study will bring a comprehensive interpretation.

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