



The Effect of Integration of English Learning and Character Building Based Artificial Intelligence (Ai) On Student Learning Outcomes

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Abstract

This study aims to evaluate the effectiveness of integrating artificial intelligence (AI)-based English learning with students' character development, particularly in narrative text writing. AI tools such as Grammarly, QuillBot, and ProWritingAid are used to support this learning process. The research focuses on analyzing the impact of technology integration on students' academic achievement and character building of responsibility, creativity, and confidence. The study used an experimental design involving two groups, namely experimental and control. The experimental group received AI tools-based learning for six sessions, with each tool being used in turn to improve students' narrative texts. Data was collected through tests to evaluate students' writing skills, questionnaires to measure character development, and observation sheets to monitor students' interactions during learning. Data was analyzed using paired T-test and independent T-test techniques to compare the results between experimental and control groups. The results showed that the use of AI tools had a significant impact on students' character development, especially in the aspects of responsibility, creativity, and self-confidence, based on questionnaire and observation data. However, the impact on academic achievement was not significant within the limited duration of the study. This finding confirms that the integration of AI-based technology can effectively support character learning, although optimization for academic improvement requires time and a more comprehensive strategy. The integration of technology with appropriate pedagogical approaches provides opportunities for holistic language learning.

Keywords: *English Learning, Artificial Intelligence (AI) Tools, Student Character, Student Outcomes.*

Introduction

Education must adapt to the various changes in the era of globalization and rapid technological development. One of the emerging innovations is the use of artificial intelligence (AI) in the learning process. AI offers various tools and methods that can improve learning effectiveness, especially in English language acquisition and student character building. As an international language, English plays an important role in global communication. Mastery of this language is considered a skill, and a part of the competencies needed to compete in the world of work. Therefore, integrating English learning with AI technology-based approaches can help students understand the language more effectively and interactively (Zawacki-Richter, 2019).

On the other hand, character education is also a major focus in the education curriculum in many countries. Character education aims to shape students' personalities and morals so that they are not only academically intelligent but also have good integrity and ethics. Using AI in character education can create a more supportive learning environment where students can practice and apply character values in a more real context. Further away, the use of AI in English teaching also has some challenges. One of the main challenges is how AI can help students build better character. Character is an important part of education, as students with good character will be better able to interact with others and build better relationships.

The problem of using AI-based technology in education is important and urgent to find a solution immediately (Humble, 2022). Based on several studies that discuss the dangers of AI-based technology, it was found that the use of AI technology in education shows at least three dangers (UNESCO, 2018). First, the use of AI technology in the world has the potential to threaten the sustainability of character education. Education is one of the most important investments for the future of mankind. One aspect that is built through education is the character of the learners. Good character values such as honesty, religiosity, justice, and self-confidence, in addition to Pancasila values, can be threatened because of the rampant use of AI technology in the world of education.

The second danger is that the use of AI-based technology in education has the potential to dilute academic ethics such as honesty, academic integrity, and originality. AI-based services such as ChatGPT have been proven to be able to provide convenience to students in completing various learning tasks. Starting from simple tasks to complex tasks, the effectiveness and efficiency offered by this AI-based technology are certainly very tempting for anyone who uses it (Lund, 2023). The values of honesty, integrity, and originality can be defeated. By the value of effectiveness and efficiency offered by this AI-based service. Third, the danger of using AI-based technology in education is the potential to turn off human or student creativity and critical thinking skills. Human interaction and AI technology, which are not accompanied by awareness of human autonomy, are feared to kill the creativity and critical thinking abilities of students. When faced with complex

problems that require long problem-solving, it is feared that students will lose their learning motivation (Algabri, 2021).

Previous studies have shown that the use of AI in English teaching can improve students' motivation and proficiency in English. However, it is still unclear how AI can help students build better character. Therefore, analyzing the integration of English teaching and character building in AI-based learning is very important. The reason why character building should be integrated into education is that education has a purpose: to increase someone's intelligence and change human personality to have good attitudes and morals. Increasing someone's intelligence without paying attention to their character will certainly reduce the moral quality of students. That is why building students' character is also the best way to increase good moral values, so they have better personalities. Also, knowledge and character have become a unit that can increase the academic achievement of students. Knowledge, skills, and character are some of the elements in character building needed to improve student academic achievement (Aunurrahman, 2016).

This study focuses on student learning outcomes, namely student achievement and student character. Then, student achievement focuses on student writing skill in this case determined by writing narrative text, and student character is focused on responsibility, creativity, and confidence. Then, AI tools used are Grammarly, QuillBot, and ProWritingAids. All of that is intended to answer research questions; Is the integration of English learning and character-building-based artificial intelligence (AI) effective to improve student English achievements, and is the integration of English learning and character-building-based artificial intelligence effective to build student English characters? The unique contribution of this research lies in its comprehensive approach to integrating artificial intelligence (AI) with English learning and character building.

While numerous studies have explored AI in educational contexts and character education separately, this research combines these elements in a novel way. Dual focus integration: this research lies in the integration between English language learning and student character building by using AI technology. The use of AI, not only as a language learning tool but also to develop student character (responsibility, creativity, and confidence). Therefore, this study aims to examine the effect of integration of English learning and character-building-based artificial intelligence on student English achievements, and to examine the effect of integration of English learning and character-building-based artificial intelligence on student English characters.

Method

A quasi-experiment was chosen for this study with pre-test and post-test design of experimental group and control group. The sample were 11th grade students at SMAN 4 Bone-bone, with 60 students divided into two groups, each consisting of 30 students for the experimental group dan control group. This study used a test research instrument for knowledge assessment and an observation sheet as a character assessment. The study was conducted in 6 meeting by using AI tools (Grammarly, QuillBot, and ProWritingAids), the first two meetings used Grammarly, the next two meetings used QuillBot, and the last two meetings used ProWritingAids. Furthermore, data analysis on the test instrument used a pre-test and post-test design with Paired T-Test and Independent T-Test. While on the observation sheet to find the t-value with Paired T-Test and independent T-Test.

Results

Test (Knowledge Assessment)

Tests were conducted in the form of pre-test and post-test. The test was carried out and done by samples divided into two groups, the experimental group and the control group. The following are the results of the pre-test and post-test for the experimental group and the control group as follows:

Table 1: Pre-test and Post-test results (knowledge assessment) of the experimental group and control group

Assessed Aspect	Experimental Group										Control Group									
	Pre-Test					Post-Test					Pre-Test					Post-Test				
	Min	Max	Mean	Median	Modus	Min	Max	Mean	Median	Modus	Min	Max	Mean	Median	Modus	Min	Max	Mean	Median	Modus
Content & Ideas	5	15	9.6	10	10	5	20	9.5	10	10	5	15	9.533	10	10	4	13	9.3	10	10
Organization	5	12	8.333	9	10	5	12	7.7	8	8	4	12	8.267	9	10	5	13	7.033	6	5
Grammar & Language Use	5	10	6.433	5	5	5	7	5.333	5	5	5	10	5.733	5	5	5	8	5.4	5	5
Vocabulary	3	10	6.7	6	5	4	10	6.533	6	5	4	8	5.933	6	6	4	6	5.367	5	5
Mechanic	4	9	5.733	5	5	5	8	5.733	5	5	3	7	4.867	5	5	4	6	5.1	5	5
Creativity	3	8	4.767	5	5	3	8	5.333	5	5	3	8	5	5	5	3	7	4.433	4	4
Total Point	28	58	41.57	41.5	40	30	51	40.13	39	38	27	58	39.33	39	39	27	49	36.63	36	37
	1247					1204					1180					1099				

Grade Scale	Experimental Group		Control Group	
	Pre-Test	Post-Test	Pre-Test	Post-Test
90-100 Excellent	0	0	0	0
80-89 Good	0	0	0	0
70-79 Fair	0	0	0	0
60-69 Poor	0	0	0	0
<60 Very Poor	30	30	30	30

Student Achievement

Group	Pre-Test	Post-test
Experimental Group	1247	1204
Control Group	1180	1099

Test (Knowledge Assessment) Result

The table above is the pre-test and post-test result of the experimental group and control group. The table shows the results of minimum, maximum, mean, median, and *modus* (mode) scores for the assessed aspects, likely content and ideas, organization, grammar and language use, vocabulary, mechanic, and creative. The table showed total score that obtained by both groups. Experimental group pre-test score is 1247 points, and pos-test score is 1201 points, beside that control group pre-test score is 1180 points, and post-test score is 1099 points.

Then, the table above also shows the grade scale that must be taken by the experimental group and control group, namely excellent, good, fair, poor, and very poor. And the table shows that the whole samples from the experimental group and control group obtained a very poor scale. Next, there is also a chart that shows a decrease in scores of both groups. In the experimental group a pre-test score of 1247 points fell to a post-test score of 1204 points, while in the control group a pre-test score of 1180 points fell to a post-test score 1099 points.

Furthermore, the following is a comparison table of pre-test and post-test for both groups and the results of the t value to see student achievement, as follows:

Table 2: Comparison of student achievement of the two groups

Test Results	Experimental Group	Control Group
Pre-Test	1247	1180
Post-Test	1204	1099
t	Paired T-Test: $t = 1.04$, $t_{table} = 2.04$	Independent T-Test: $t = 0.50$, $t_{table} = 2.001$

Based on the table above, a comparison of the pre-test and post-test results of experimental group and control group. Thereafter the table also presented a comparison of T-test score.

Observation sheet (Character Assessment)

In this study, the observation sheet was implemented to see or measure the development of student character during learning or treatment to experimental group and no treatment to control group. These observations were carried out only at the second, fourth, and sixth meetings. So, this observation took place only three times. Furthermore, the following are the results of the observations from the second, fourth, and third meetings as follows:

Table 3: Scoring of observation sheet to both groups

Aspect Observed	Meeting	Experimental Group						Control Group					
		Min	Max.	Mean	Median	Modus	Total Score	Min	Max.	Mean	Median	Modus	Total Score
Responsibility	The Second Meeting	9	19	14.33	14	14	417	9	18	13.2	13	13	386
	The Fourth Meeting	10	17	14	15	15	420	11	15	12.7	12	12	381
	The Sixth Meeting	11	18	14.3	15	15	429	10	18	13.13	13	13	394
Creativity	The Second Meeting	8	17	12.73	13	14	382	8	17	12.07	12	12	362
	The Fourth Meeting	9	18	13.3	14	12	399	11	17	12.53	12	12	376
	The Sixth Meeting	11	17	13.4	13	13	402	9	17	12.13	12	13	365
Confident	The Second Meeting	8	16	11.47	12	12	305	6	13	10.6	11	12	318
	The Fourth Meeting	8	16	12.6	13	13	378	8	14	11.57	12	11	347
	The Sixth Meeting	8	15	14.53	14	13	385	8	14	11.47	11	11	344

The table above is the result of the observation sheet conducted on both groups. The table explains the minimum, maximum, mean, median, and *modus* (mode) score with the assessment aspects responsibility, creativity, and confidence. Then the table also presents the scores based on each meeting. Based on the table above, the total score of each aspect assessed, in the responsibility aspect the total score is 1266 points, then creativity is 1183 points, and confident is 1068 points for experimental group. Meanwhile control group the total scores for responsibility are 1161 points, then creativity are 1103 points, and confidence are 1009 points. The score above is obtained from the total scores of the second meeting, the fourth meeting, and the sixth meeting.

The following are the scores from the T-test results

Table 4: T-test results

T-test	Experimental Group	Control Group
t value	Paired T-test: $t = 30.08$, $t_{table} = 2.04$	Responsibility: Independent T-Test $t: 37.75$, $t_{table} : 2.001$
		Creativity: Independent T-Test: $t = 7.91$, $t_{table} = 2.001$
		Confidence: Independent T-Test: $t = 1.62$, $t_{table} = 2.001$

The table above presents the result of T-test of both groups, and the objective of T-test is to analyze the difference in total scores between the experimental group and the control group.

Discussion

Student Achievement

Based on the data on findings, it explains that the experimental group showed a decrease in the total score from pre-test to post-test in the experimental group (1247 → 1204), indicating that the use of AI tools did not provide significant improvement in the study period. This is reflected in the paired T-test results ($t = 1.04 < t_{\text{table}} = 2.04$), which means that the null hypothesis (H_0) is accepted, stating that there is no significant difference in achievement before and after the AI tools intervention. This decrease could be due to students' difficulties in initial adaptation to AI tools or the complexity of narrative text material that requires tiered development.

Furthermore, in the control group there was a decrease in the total score from pre-test to post-test (1180 → 1099) indicating that the conventional learning method may not support the development of complex writing skills. This is also supported by the results of the Independent T-test between the experimental and control groups showing $t = 0.50 < t_{\text{table}} = 2.001$, stating that there is no significant difference between the two groups in writing achievement.

Dalton-Puffer's and Lasagabaster and Sierra's research highlights that language integration-based learning is more effective when done in a real context (Dalton-Puffer, 2007), (Lasagabaster, 2009). This approach supports the development of students' language skills, especially in narrative writing tasks. However, the short duration and lack of familiarization with AI tools may limit its impact, as seen in the results of this study. Students in the experimental groups using Grammarly, Quillbot and ProWritingAid did not show significant improvement in their academic achievement tests. This may be due to the lack of contextual dimension in their tasks compared to traditional teacher-guided learning

Then, Chen Y, et al., states that automatic feedback from AI tools, such as Grammarly, can help students recognize grammatical errors directly (Chen, 2021). However, the effectiveness of these tools largely depends on students' understanding of the corrections provided and the extent to which they apply them in their writing. The results of this study support these findings; although students received automated feedback, their writing scores did not improve significantly. Gonzalez and Martin further explain that the use of educational technology requires adaptation time for students to get used to the features of the tool (Gonzales, 2021). The short duration of the study is a limiting factor that might explain this result, as seen in the experimental group in this study.

The findings indicate that the integration of AI tools requires a sustained approach to have a significant impact on students' academic achievement. The limited duration of the study is an important limitation in this context. Similarly, the study of Chen et al. states that the use of Grammarly has a more significant impact if applied to repeated learning sessions, allowing students to become more familiar with autocorrect and grammar suggestions (Chen, 2021).

Student Character (Observation Sheet)

Based on the data on the findings above, the increase in student responsibility can be seen from the consistent completion of revision tasks. The total score is 1206 points, indicating that the use of AI tools helped students to be more focused and organized. Then, students' creativity developed along with their ability to explore sentence variations and writing styles supported by QuillBot. The increase in scores from 382 to 402 with a total score is 1183 points. Subsequently, students' self-confidence increased significantly, as seen from the score that rose from 305 to 385 with a total score is 1068 points. This is consistent with other research showing that automated feedback helps students believe more in the quality of their work.

Based on the review of the data above, the use of AI tools such as Grammarly plays an important role in increasing student responsibility. Bhatia explains that Grammarly encourages students to revise their writing independently, building a sense of responsibility through auto-correction (Bhatia, 2021). This is in line with the observation results of this study, where students' responsibility scores in the experimental group increased gradually during the intervention. Students showed higher initiative to complete tasks on time after receiving feedback from the AI tools. This aligns with Lickona's perspective that integrates technology-based learning with character education to foster positive behaviors, such as student responsibility in learning (Lickona, 1991).

In addition, students' creativity is supported by QuillBot's ability to suggest sentence variations and language styles. Hamed emphasizes that AI tools such as QuillBot provide wider opportunities for stylistic exploration, encouraging students to think creatively in composing texts (Hamed, 2020). This finding was reflected in the questionnaire data, which showed a significant increase in creativity in the experimental group. This increase indicates that QuillBot facilitated the exploration of sentence structure, in line with Fogarty's theory of integrated learning, which states that learning tools that support creative exploration can enrich students' thinking processes (Fogarty, 1991).

Furthermore, students' confidence also increased significantly using ProWritingAid, as explained by Gonzalez and Martin. This AI tool provides detailed feedback, helping students understand the strengths and weaknesses of their writing (Gonzales, 2021). In this study, the increase in student confidence in the experimental group was monitored through observation and questionnaire results,

especially in the final session. Zhou and Wang also noted that the positive feedback from the AI tools was able to motivate students to be more confident and dare to try variations of more complex writing styles (Zhou, 2020).

This finding supports Vygotsky's theory about the zone of proximal development (ZPD), where AI tools serve as scaffolding to help students reach their full potential (Vygotsky, 1979). Therefore, based on the data, it shows that AI tools effectively contribute to students' character development, in line with the principles of character-based learning in Coyle, Hood, and Marsh's research (Coyle, 2010).

Integrated learning, according to Fogarty, facilitates students' character development through tasks that involve cooperation and exploration. In the context of this study, the increase in students' responsibility is evident from the observation scores that continued to increase during the intervention sessions (Fogarty, 1991). The use of AI tools such as Grammarly helped students take the initiative in revising their writing, thus supporting the development of responsibility. In addition, Fogarty's collaboration theory states that interaction and discussion in integrated learning contribute to positive character building (Fogarty, 1991). In this study, although students used technology more than traditional discussion, AI tools replaced this function by providing relevant and personalized automated feedback.

Then, the integration of technology and character education as described by Lickona allows students to learn through direct experience that is relevant to their lives (Lickona, 1991). The results showed that the experimental group was superior in character development compared to the control group. The increase in students' creativity, as observed through questionnaires and observations, is supported by QuillBot, which provides a variety of sentence structures and vocabulary. This supports the theory that technology-based tools can expand students' exploration space, thus encouraging innovation in writing tasks. In addition, ProWritingAid provides detailed and real-time feedback, which helps students increase their confidence, as stated by Zhou and Wang (Zhou, 2020).

Furthermore, Vygotsky's Zone of Proximal Development (ZPD) theory explains how technology can serve as scaffolding to help students reach their zone of potential development (Vygotsky, 1979). AI tools such as Grammarly and ProWritingAid provide appropriate support at students' ability levels, allowing them to complete more complex tasks with more confidence. In this study, observations supported this theory, with a significant increase in students' confidence in the experimental group. This positive change indicates that the use of AI tools not only supports technical ability in writing but also develops students' character holistically through an integrated approach to technology.

Conclusion

The test results showed that the use of AI tools (Grammarly, QuillBot, ProWritingAid) did not have a significant impact on students' writing achievement within the limited time of the study. The experimental and control groups showed no significant difference in narrative text writing ability. This indicates that the duration of adaptation to technology as well as the complexity of the writing task were factors that influenced the results. The use of AI tools had a significant impact on students' character development, especially responsibility, creativity, and self-confidence. Observation data showed that students in the experimental group experienced consistent character improvement during the learning session. This proves that technology does not only function as a learning tool but also to shape student character.

Furthermore, this research offers new insights into the strategic combination of AI tools to meet multidimensional learning needs. Grammarly supports responsibility through auto-correction, QuillBot enhances creativity through language exploration, and ProWritingAid builds student confidence through detailed feedback. The findings confirm the importance of technological integration in holistic learning that includes both cognitive and affective dimensions.

Future research can extend the duration of the study to evaluate the long-term impact of AI tools on students' academic achievement. In addition, research with a larger sample size may provide more generalizable results. And the impact of AI tools on student character development opens opportunities for further exploration of the role of technology in character-based education. Future research could focus on specific aspects such as digital ethics and technological literacy relevant to 21st-century needs.

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