

Employing Augmented Reality in Reading Classes for Indonesian EFL Junior High School Students: A Perspective Analysis

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ABSTRACT

ARTICLE INFO

Article history:
June 18, 2024

Revised
June 25, 2024

Accepted
August 26, 2024

In an educational context, reading skills are essential for students, particularly in the ELT context. Good reading skills are not only profitable for fostering vocabulary. They are also essential for fostering students' understanding of complex text. Integrating technology, especially Augmented Reality (AR), becomes one of the transformative keys to gaining students' engagement and enthusiasm for learning activities. With an explanatory sequential mixed method and a convenient sampling technique, this comprehensive study observes eighth-grade students' perspectives on AR implementation in their reading class. Of 135 students, 51 were conveniently involved in the study in the first phase. Besides, 5 of 51 students were invited to interview sessions in the second phase. The essential findings of this study revealed that the use of AR eased students' understanding of the text, especially texts using present continuous tense. The use of AR enhanced students' engagement and involvement in instructional activities. The use of AR provided a practical and interactive learning climate. By this point, AR implementation in this study fulfilled students' needs and fostered an adaptive and responsive learning environment. AR provides a dynamic and exciting learning environment that boosts students' reading skills. The AR utilization allows students to interact directly with the reading content and strengthen their understanding of the scenario. That reveals the enormous potential of AR technology in transforming how we conduct instructional activities, particularly in enhancing reading skills and comprehension for eighth-grade students.

Keywords: *augmented reality; ELT, perspective analysis; reading skills; student engagement.*

How to cite Nyudak, I. B. G., Pratama, D. G. S., Sugiani, N. N., & Putra, I. N. A. J. (2024). Employing Augmented Reality in Reading Classes for Indonesian EFL Junior High School Students: A Perspective Analysis. *Pedagogy: Journal of English Language Teaching*, 12(2). 142-157
DOI: 10.32332/joelt.v12i2.9579.

Journal Homepage <https://e-journal.metrouniv.ac.id/index.php/pedagogy>

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INTRODUCTION

English language teaching (ELT) has an essential influence in Indonesia since it is a global communication, commerce, technology, and education tool. People nowadays are increasingly interested in English proficiency, so they consider equipping themselves with good English proficiency and skills since their early education. English skills can be classified into four: reading, listening, speaking, and writing skills. Reading is one of the skills that students need. According to Srinivasan and Murthy (2021), reading is essential in educational aspects because it boosts students' vocabulary mastery when learning a particular language. Reading is a process of connecting students' brains to a particular understanding, which helps them to gain information and comprehend the context being read (Abubakar & Abdullahi, 2022; Anaktototy & Lesnussa, 2022; Apoko & Marcellinda, 2023; Blixen & Pannell, 2020; Rohmah & Khotimah, 2020). Mastering reading skills become essential, but teaching reading is becoming a challenge for most teachers because it requires a proper plan and methods to match students' needs in instructional activities.

Considering English teachers' challenges in teaching reading, Oakhill (as cited in Jayanti, 2016) stated that several problems influence students in reading, such as lack of vocabulary mastery, language features, and structural complexity. Besides, Hezam et al. (2022) pointed out that reading difficulties are

influenced by inadequate instructional methods and materials, which influence students' motivation and engagement. Problems in reading vary from some levels, including lack of text comprehension, vocabulary, and difficulty forming the situational model of the text being read (Yusuf & Fauzan, 2016). Therefore, it becomes essential for teachers to employ adequate learning strategies in reading to increase students' motivation, engagement, and comprehension.

The teaching method in reading is essential since it is an integral aspect of instructional activities. The teacher becomes a key component in implementing reading skills in classroom activities. Involving students in teaching reading, Jufri (2021) considered that teachers have a responsibility to provide proper media and strategies since students need to develop reading skills based on their levels (Ghorbani Shemshadsara et al., 2019; Mulatu & Regassa, 2022; Shokrpour et al., 2019). Given students' various reading levels, employing technology in instructional activities serves promising results.

Technology has experienced massive development nowadays. Humans are getting closer to technology because it is widely used worldwide, and almost everyone has the freedom to access technology (Jamrus & Razali, 2019, 2021). The development of technology has been inserted into many aspects of life, such as education. Kukulska-Hulme (as cited in Jamrus & Razali, 2019) considered

language and literacy education, technology integration has emerged with tremendous effectiveness in its use. The utilization of technological tools in language education, specifically for the teaching reading process, has led to some changes, such as teaching material used by teachers and students (Çetin & Türkan, 2022). With the availability of considerable digital teaching tools, teachers must consider the teaching media more meticulously (Karacan & Akoğlu, 2021). Looking further, Çetin and Ulusoy (2023) stated that students are also positively affected by introducing such media tools that involve technology in the learning environment. Regarding this effect, demand for reform education is continually needed by adapting to technological advancements (Karacan & Akoğlu, 2021).

The recent outgrowth of technology used in the educational field is augmented reality (AR), which was first established in the late 1960s. In the implementation, AR reflects the augmentation of the physical, real-world environment by adding computer-generated information simultaneously (Wedyan et al., 2022). The nature of AR toward education creates a new learning experience by allowing students to interact with real and virtual objects in the same medium (Majid & Salam, 2021). The integration of AR as a teaching media in language learning has reportedly shown many positive impacts and advantages, such as improved achievement, boosted motivation, and engagement and attention among learners

(Majid & Salam, 2021). In terms of teaching reading skills, the assistance of AR could provide a new immersive learning reading environment by visualizing the presenting visual imageries and promoting a higher reading motivation for the learners (Jamrus & Razali, 2019, 2021). Wu et al. (as cited in Jamrus & Razali, 2019) commented that students are also provided with broader opportunities to improve their reading comprehension rapidly, such as in finding out particular word meanings with the assistance of AR. Furthermore, AR is considered a great innovation of modern visualized information because it promotes effectiveness for students to be involved and discover knowledge in reading skills (Wedyan et al., 2022).

Aside from the advantages AR brings, some challenges and limitations must be faced when implementing this technology. Generally, the difficulties of AR execution in education are primarily found in pedagogical, technological, and learning matters (Wedyan et al., 2022). In terms of pedagogy, students are overwhelmed with information (Jamrus & Razali, 2019), which leads to being cognitively overloaded (Wedyan et al., 2022). The most common issues reported concern technical problems influenced by unprepared AR software, such as delayed and inconsistent responses and unexpected errors (Majid & Salam, 2021). Hardware readiness is crucial in integrating AR. In terms of learning matters, the distraction provided by AR could lead students to pay less attention to the actual educational content. Instead,

they are more attracted to the virtual object being augmented (Jamrus & Razali, 2019, 2021). However, AR technology is still being innovated. Therefore, those limitations might be overcome as the exploration and development of AR come with unlimited time.

Several studies have been conducted regarding the implementation of AR in instructional activities. A study conducted by Ibáñez et al. (2016) focused on investigating the impact of AR-based applications to support 82 ninth-grade students' learning behaviour and performance by providing meaningful activities in inquiry and discovery learning. This study utilized a quantitative experimental research design. The result showed some improvement in learning achievement by the experimental group compared to the control group. Self-desire also indicates better learning behaviour, such as exploring and reading the subject matter before experimentation.

Abas and Zaman (2011) conducted a study to develop a Malay language storybook that involved AR technology. This study addressed issues faced by remedial students, who indicated that negative behaviour influenced cognition, motivation, and emotion. By implementing AR technology as a storybook, this study results in new media and teaching techniques that can benefit future research and teaching matters.

Piriyasurawong (2020) conducted a study to design a reading technique called the Scaffolding Augmented Reality Model

in order to provide an immersive new learning environment to improve students' deep reading (advanced reading skills). This technique involved AR reading media by visualizing the overlying text. The result indicated a significant enhancement of the score. Therefore, this study concluded that AR assistance could improve students' deep reading skills, especially in foreign language subjects.

Concerning students' reading activity issues found in the statements above, a recent study was conducted based on a similar phenomenon. The pre-observation data showed that the teacher in the subject school still utilized conventional media reading sources such as textbooks, while the activity was centred on the teacher's instruction. No particular teaching strategy is used, especially for reading activities. Moreover, it has also been found that students experience flatness in their learning process due to fewer media options. It also affected the teachers' creativity. Not much could be done due to poor media and strategies used in teaching, especially in reading.

Regarding the issue found in the subject school, which is also strengthened by the problem based on previous research, preliminary conclusions can be drawn concerning what factors influenced the low reading interest of students. The main is an improper strategy used, while teaching media also meets the same. Meanwhile, it is known that teaching strategy leads to how the lesson will go; a well-prepared strategy will result in effective learning. There are

several activities that the teacher can implement in reading classes. This study focused on applying augmented reality-based applications to teaching reading media. That technique and media will provide a promising teaching reading activity and give students new experiences.

Previous research has proven that augmented reality benefits students' learning, especially regarding achievement and interest enhancement. Regarding those prior findings, this research aims to determine students' perspectives toward using augmented reality-based applications in reading class. Most previous research used and developed many AR applications to support instructional activities. Compared to those, this recent study utilized the questioning technique in employing the Hologo and JigSpace AR-based application in Indonesian EFL Junior High English reading classes.

METHOD

The current study employs an Explanatory Sequential Mixed-Method design, where data collection will begin with a quantitative phase and subsequently be followed by a qualitative phase (Creswell & Clark, 2011). This approach aims to merge and synthesize data gathered from both quantitative and qualitative perspectives. Additionally, the Explanatory Sequential Mixed-Method complements and elaborates on the quantitative findings with qualitative data. The quantitative data offer an overall understanding of the research problem, while the qualitative

analysis deepens and clarifies for comprehensive understanding (Creswell et al., 2003; Othman et al., 2020). For this study, students will be surveyed through a close-ended questionnaire to gather quantitative data. In-depth interviews will then be utilized to clarify perspective analysis and obtain more detailed and accurate data.

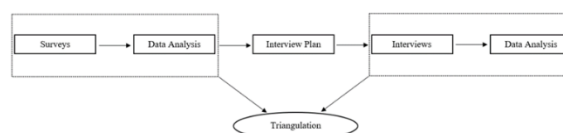


Figure 1. Explanatory Sequential Mixed-Method Design

Setting and Participants

The subjects selected for this study are eighth-grade students in one of the Junior High Schools in Bali. Before conducting the research, the researchers submitted a letter of request for permission to the school principal to conduct the research. After receiving permission, the researcher, who is also a teacher at the school, teamed up and conducted the research accordingly. The subject selection was based on their participation in reading activities during instructional sessions and their apparent low interest in reading. To ensure representative and valid data, a survey was distributed to 135 students who expected to be involved in the research using convenience samples because they were considered adequate and willing to be used as research subjects in this study. Of 135 students, 51 were conveniently involved in the study in the first phase. Besides, 5 of 51 students were invited to interview sessions

in the second phase to enhance clarity toward the data collected through survey. There were six close-ended questions as the interview guide which mainly adapted from statements in the previous questionnaire, regarding the initial purpose of digging more information on students' perception toward AR integration. Furthermore, the interviews were given to five students as respondents, selected through the indication of negative answers they gave in the questionnaire. Through this strategy, researchers intended to find more detailed answers regarding the reasons for the responses. With many subjects, the mean and standard deviation obtained will likely resemble the population mean and standard deviation because these numbers are related to statistical hypothesis testing (Alwi, 2012).

Data Collection Procedures

The questionnaire will be used to gather quantitative data in the first phase. It will be distributed via Google Forms and subsequently analyzed directly. Following the quantitative data analysis in the first phase, the second phase will involve conducting in-depth interviews. There were six close-ended questions as the interview guide which mainly adapted from statements in the previous questionnaire, regarding the initial purpose of digging more information on students' perception toward AR integration. Furthermore, the interviews were given to five students as respondents, selected through the indication of negative answers

they gave in the questionnaire. Through this strategy, researchers intended to find more detailed answers regarding the reasons for the responses.

Data Analysis

The data analysis techniques will involve statistical and descriptive analyses to acquire students' perspectives. Quantitative data analysis will follow the categorization method outlined by Brown (2010), which segments the quality of implementation into four categories: Strongly Agree, Agree, Disagree, and Strongly Disagree. Furthermore, for enhanced clarity in the findings, an in-depth interview will be conducted and analyzed, utilizing the approach by Miles and Huberman (as cited in Rijali, 2018) involving data reduction, data display, concluding/verification, and triangulation.

RESULTS AND DISCUSSION

Result

In this research, 51 eighth-grade EFL students from a junior high school in Bali participated in the first phase to evaluate the effectiveness of Augmented Reality (AR) in their reading classes. This evaluation was based on six items designed to measure students' learning experiences and preferences. Data collection was conducted through a survey using a close-ended questionnaire. Students' perceptions were categorized into four response options: Strongly Agree, Agree, Disagree, and Strongly Disagree. The following table presents the EFL students' perceptions of

AR implementation in their reading classes, providing insight into how AR influenced their learning experience and preferences.

Table 1. Students' Perception of AR Implementation

No	Statement	Mean Score	Std. Deviation	Strongly Agree (%)	Agree (%)	Disagree (%)	Strongly Disagree (%)
1	Learning to read in English is easier with Augmented Reality	3.24	.651	35.30	52.90	11.80	0.00
2	Learning to read in English is more fun with Augmented Reality	3.31	.583	37.30	56.90	5.90	0.00
3	I prefer to learn to read in English using Augmented Reality compared to other media	3.06	.645	21.60	64.70	11.80	2.00
4	I prefer learning to read in English with Augmented Reality over other media	3.04	.72	25.50	54.90	17.60	2.00
5	Augmented Reality can increase my enthusiasm for learning to read in English	3.24	.79	41.20	45.10	9.80	3.90
6	Augmented Reality can improve my ability to read in English	3.18	.74	33.30	54.90	7.80	3.90

The first statement, "Learning to read in English is easier with Augmented Reality," got a mean score of 3.24 with a standard deviation of 0.651. A total of 35.3% of students agreed strongly with the statement, 52.9% of students agreed, 11.8% disagreed, and none disagreed strongly with the first statement. This indicates that the majority of students perceived using AR as an ease in learning to read in English. Moreover, further exploration was done by interviewing 5 of 51 students. The samples of positive and negative clarification derived from the interview are as follows:

"Learning to read in English with AR is easier because of the hands-on experience."

Meanwhile, there is also a negative response, as mentioned in the following response:

"I disagree that learning to read in English using AR is not easier than other media because I also enjoy reading and learning with books."

Most answers given were on the effectiveness of learning practice. They agreed that learning English reading using AR gave some benefits, such as making learning more efficient and helping them understand the material more easily. Even more, with the assistance of AR, they got a new, real-like experience in learning because AR can provide a realistic object, and they can learn the reading through the text inserted in the AR. However, there was one answer that led to a negative result given by a student. The response disagreed that learning English reading through AR provides easiness. The student intended to prefer using conventional textbooks

instead of technological media like AR to learn English reading.

The second statement, "Learning to read in English is more fun with Augmented Reality," got a mean score of 3.31 with a standard deviation of 0.583. A total of 37.3% of students agreed strongly, 56.9% agreed, 5.9% disagreed, and none of them disagreed strongly. The result indicated that most students perceived learning to read in English as more fun with AR assistance compared to conventional teaching methods. The following statement is the transcription of the interview:

"Because learning with AR media includes images that can create an enjoyable learning experience."

The augmentation of 3D objects in AR mainly influenced the tendency of participants' responses. Most of the respondents were satisfied with the use of AR, which assisted them during the meeting. They agreed that by using AR, they obtain new learning experiences and new ways of exploring the learning material. Showing them realistic objects that can move in AR can attract their attention to be focused on learning and providing a satisfying learning environment.

The third statement, "I prefer to learn to read in English using Augmented Reality compared to other media", got a mean score of 3.06 with a standard deviation of 0.645. It is counted that 21.6% of students agreed strongly, 64.7% agreed,

11.8% disagreed, and 2% disagreed strongly. Generally, the result showed that most students prefer to utilize AR compared to other media, even though a small number disagreed.

"In my opinion, no Sir, because I am not dependent on learning with AR. I can also learn English using other media, such as books or even on my phone."

Most of the participants agreed with the statement that they prefer to use AR in their reading classes. However, some of them also delivered their own opinion, which refers to the rejection of using AR as the only medium to learn English reading. Although they were satisfied with AR, they also wanted to explore their learning by discovering other media, such as those that involve technology that they can access from their smartphones. Moreover, they also realized that in their learning process, the media often used is textbooks. Therefore, they get used to learn to read on actual paper or printed-out text. They argued that it was not necessary to learn English reading by integrating technological media because they found more convenience in the use of textbooks. Another factor indicated was a situation where they were aware that they did not want to depend on their smartphone, even though they fully realized that they could explore tons of better applications to learn English reading on their smartphones.

The fourth statement, "I prefer learning to read in English with Augmented Reality over other media," got

a mean score of 3.04 with a standard deviation of 0.72. A total of 25.5% of students agreed strongly, 54.9% agreed, 17.6% disagreed, and 2% disagreed strongly. This data is consistent with previous data showing better preferences for AR utilization over other media in instructional activities. The following statements represent positive and negative responses from students.

"The preference for learning English with AR is due to the appeal and innovation of the technology."

Meanwhile, there is also a negative response, as mentioned in the following response:

"In my opinion, I prefer learning using other media, but AR is quite enjoyable."

Most students agreed and gave positive answers to the statement that they like learning to read English using augmented reality. They believed that using augmented reality would improve the learning environment and make them enjoy learning English because they could see things visually, which was fun and interactive. Besides, several students disagree with the statement that learning using augmented reality is fun and able to deliver the materials because they perceive that they want to learn with another medium and explore by themselves. They also prefer direct learning instruction from teachers.

The fifth statement, "Augmented Reality can increase my enthusiasm for learning to read in English," got a mean

score of 3.24 and a standard deviation of 0.79. A total of 41.2% of students agreed strongly, 45.1% agreed, 9.8% disagreed, and 3.9% disagreed strongly. It indicates that AR not only eases students' learning and makes learning more fun but also enhances their learning engagement. Moreover, the following representative interview transcriptions clarify the above findings.

"AR can enhance my learning motivation because it presents learning in an engaging way."

On the other hand, more than AR was needed to increase students' engagement in learning English because it confused them about understanding the materials.

"AR is not enough to boost my learning motivation as I prefer learning directly from books or being explained by a teacher."

From those findings, most students agreed that augmented reality could increase their motivation to learn English and engage their reading comprehension. Learning using augmented reality could also help them understand because learning through pictures and visuals is fun. On the other hand, one student did not agree with the statement during the interview because he preferred to learn by explaining directly to the teacher more clearly and through the interaction between student and teacher.

The sixth statement, "Augmented Reality can improve my ability to read in English," got a mean score of 3.18 with a

standard deviation of 0.74. 33.3% of students agreed strongly, 54.9% agreed, 7.8% disagreed, and 3.9% disagreed strongly. The data showed that most students perceived AR utilization as effectively improving their reading skills. The following excerpt might help to clarify the survey.

“My English reading comprehension has improved thanks to AR's use of images and visuals, which allow for direct understanding of the material.”

They agreed with the statement that augmented reality can increase their ability to read the English language. They believe that by using augmented reality, students can engage their ability in reading and understand the words given by directly seeing the picture or visual from the application. Therefore, they can learn new words and use those words.

The survey and interviews showed that most students perceived a significant influence of AR utilization in their English reading classes. They perceived that AR makes learning fun and engaging, increases motivation, and improves reading skills. Even though a small number of them disagreed with several statements, many of them perceived it positively. This case emphasizes AR's potential as an effective tool in enhancing the learning experience and learning achievement in the ELT context.

Discussion

This study investigated students' perspectives toward integrating Hologo and JigSpace AR-based applications in reading comprehension. This study belongs to the sequential explanatory mix method, where the data is collected through a survey and detailed explanations supported by interview results. It resulted in positive responses followed by favorable benefits gathered from the participants, proving that AR has something to do with reading comprehension. This result is highly supported by the research of Wedyan et al. (2022), who stated that AR could improve reading comprehension in language acquisition, especially in the ELT context. This possibility is influenced by many features AR provides, which can be adaptable to various language learning topics. The key feature of AR is presenting a real-time combination of computational virtual objects above the actual scenario in the surroundings (Sahin & Yilmaz, 2020). Through this function, AR appropriately supports reading activity, as supported by Jamrus and Razali (2019), who stated that teaching reading with AR provides convenience for students in understanding the text since the students are facing the illustration of the text directly.

The results collected from surveys and interviews have indicated that students' tendency to learn reading through AR is exceptionally agreed upon, and they found the benefit throughout the learning. The most frequent response was highly referred to the demonstration

process of the augmented object that effectively attracted participants' interest. It is in line with the statement of Piriyasurawong (2020) that AR can practically enhance the effectiveness and attractiveness of language reading, especially reading comprehension. Moreover, this condition was further assisted by the immersion of new learning experiences provided by AR. Students were offered authentic physical and mental conditions requiring them to contextually inter-sensing the virtual learning with their actual environment (Jamrus & Razali, 2019). A statement from participant strengthened this statement by answering;

"Learning with AR media is enjoyable because it includes images that create an engaging learning experience."

It proved that the immersion learning offered by AR can practice students' interaction through contextual experiences as part of the experimental learning process to build a better understanding (Belda-Medina, 2022).

Immersive learning is a condition where students are engaged and immersed in the learning process through the involvement of an artificial environment in experiencing a natural environment (Piriyasurawong, 2020). In other words, students learn the subject by combining fake-artificial and tangible objects. This condition is about how AR is being operated to assist learning. Furthermore, the immersive learning experiences will directly affect students' attitudes and

motivation. Because learning through AR effectively decreases the cognitive load, it increases the enjoyment of learning toward the growth of motivation and positive attitude shown by students. It was supported by the statement of Ebadi and Ashrafabadi (2022) and Piriyasurawong (2020) that the increased motivation because of enjoyment in learning provided by AR is the main point of implementing this technology. Students' motivation plays the most influential factor in language learning acquisition (Amumpuni et al., 2023).

Pedagogically, it is also found that reading with AR indirectly practiced integrated skills. Following Chang et al. (2020), integrated English skills could be effectively practiced by AR. In the AR demonstration, the participants were not supposed to read only the text; instead, they spontaneously pronounced it. This means AR can effectively enhance English listening, reading, speaking, and writing through spontaneous exercise (Chang et al., 2020).

Besides positive perspectives, some minor responses were also found, such as a negative view toward AR in reading technique. This result is influenced by the fact that AR needs continuity of development, especially in solving the limitation of enhancing English skills (Wedyan et al., 2022). Generally, the limitations drawn by participants can be classified into two categories: technical and pedagogical. Those limitations are further explained: technical refers to a lack of

supporting devices and technological problems, while pedagogical refers to digital skills and knowledge on optimizing technology (Belda-Medina, 2022). Most negative responses pointed to pedagogical limitations, where participants preferred to use textbooks rather than AR because of the complex steps involved in operating it. Also, some respondents prefer to use textbooks because they need supporting devices.

Regarding the limitation, teachers must innovate in reforming the media to find ways to accompany reading through AR with other teaching techniques and sources. As Mustofa and Sari (2020) stated, teachers must keep regenerating the media that involve enjoyment in teaching, especially in reading.

CONCLUSION

Students' perspectives on implementing AR to assist reading comprehension get positive responses among the participants. Most answers tended to become positive responses indicated by acceptance, enjoyment, and benefits obtained throughout the learning process. Most of the positive responses relied on the immersion of the learning experience by introducing a combination of three-dimensional artificial objects with a natural environment, called AR, to assist students in improving their reading comprehension. This result is based on what Jamrus and Razali (2019) stated promoting the effectiveness of teaching reading can be more convenient through

the integration of AR. The reason was that AR provides an immersive digital experience.

However, this study also found minor negative responses mainly influenced by pedagogical and technical issues. In reference to Belda-Medina (2022) and Jamrus and Razali (2019), the most significant factors in negative responses were preferences and difficulties in operating AR compared to a textbook, which related to pedagogical limitations. Several answered that supporting devices needed to be fulfilled. However, those limitations could become considerations for teachers when refining the involvement of AR with other interactive strategies.

ACKNOWLEDGEMENT

The author would like to express the highest gratitude to the parties involved in this research. Credit is given to colleagues who provided meaningful support and assistance during this research process. The author also thanks the supervisor for guidance, suggestions, and valuable input. Lastly, the author would like to thank the academic supervisor, who has provided direction and support during the research. The sincere gratitude also goes to the school's principal for the permission and support given so the author could complete this research well.

AUTHOR CONTRIBUTION STATEMENT

GN, DS, and NS jointly conducted this research, contributing equally at every stage. Supervisor AJ accompanied the entire process, providing valuable guidance and input.

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