



**INVESTIGATING STUDENTS' AND TEACHERS' PERCEPTION OF
USING GOOGLE LENS IN READING COMPREHENSION: A CASE
STUDY IN MADRASAH ALIYAH ATTARAQQIE MALANG**

THESIS

**BY:
ROWI HARNOMAN
22302073025**



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THESIS

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By

Rowi Harnoman

NPM: 22302073025

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ABSTRACT

Harnoman, Rowi. 2025. *Investigating Students' and Teachers' Perception of Using Google Lens in Reading Comprehension: A Case Study at Madrasah Aliyah Attaraqqie Malang*. Thesis, English Education Department, Postgraduate Program, Universitas Islam Malang, Advisor: (1) Sonny Elfiyanto, S.S., S.Pd., M.Pd., Ph.D. (2) Dr. Alfian Zuhairi, M.Pd.

Keywords: Artificial Intelligence, Google Lens, Qualitative case study, Reading comprehension, Students' perception, Teachers' perception.

The development of artificial intelligence (AI) technology has contributed to English language learning, particularly in reading skills. Madrasah Aliyah (MA) students still face difficulties in understanding English vocabulary and text structure. Google Lens, an AI-based application capable of scanning and instantly translating text, is one alternative utilized to aid students' reading comprehension.

This study focuses on the perceptions of teachers and students at Madrasah Aliyah Attaraqqie Malang regarding the use of Google Lens in teaching reading comprehension. The purpose of this study was to determine the views of teachers and students on the benefits of Google Lens in aiding English text comprehension and to identify the challenges encountered during its use in learning.

This study used a qualitative approach with a case study design. Participants consisted of two English teachers and four 12th-grade students selected through purposive sampling. Data were collected through in-depth interviews and analysed using thematic analysis techniques.

The conclusion indicates that Google Lens is positively perceived because it helps improve vocabulary comprehension, time efficiency, and student motivation in reading English texts. However, challenges were also identified, including students' reliance on instant translation and limited translation accuracy. Therefore, it is recommended that teachers accompany the use of Google Lens so that it functions as an effective learning support tool and does not reduce students' learning independence.

ABSTRAK

Harnoman, Rowi. 2025. *Menyelidiki Persepsi Siswa dan Guru Terhadap Penggunaan Google Lens dalam Pemahaman Membaca: Studi Kasus di Madrasah Aliyah Attaraqqie Malang*. Tesis, Jurusan Pendidikan Bahasa Inggris, Program Pascasarjana Universitas Islam Malang, Pembimbing: (1) Sonny Elfiyanto, S.S., S.Pd., M.Pd., Ph.D. (2) Dr. Alfian Zuhairi, M.Pd.

Kata Kunci: Kecerdasan Buatan, Google Lens, Studi Kasus Kualitatif, Pemahaman Membaca, Persepsi Siswa, Persepsi Guru.

Perkembangan teknologi kecerdasan buatan (AI) telah memberikan kontribusi terhadap pembelajaran bahasa Inggris, khususnya pada keterampilan membaca. Siswa Madrasah Aliyah (MA) masih mengalami kesulitan dalam memahami kosa kata dan struktur teks bahasa Inggris. Google Lens, sebuah aplikasi berbasis AI yang mampu memindai dan menerjemahkan teks secara instan, merupakan salah satu alternatif yang digunakan untuk membantu pemahaman membaca siswa.

Penelitian ini berfokus pada persepsi guru dan siswa di Madrasah Aliyah Attaraqqie Malang mengenai penggunaan Google Lens dalam pengajaran pemahaman membaca. Tujuan penelitian ini adalah untuk mengetahui pandangan guru dan siswa terhadap manfaat Google Lens dalam membantu pemahaman teks bahasa Inggris dan untuk mengidentifikasi tantangan yang dihadapi selama penggunaannya dalam pembelajaran.

Penelitian ini menggunakan pendekatan kualitatif dengan desain studi kasus. Partisipan terdiri dari dua guru bahasa Inggris dan empat siswa kelas 12 yang dipilih melalui purposive sampling. Data dikumpulkan melalui wawancara mendalam dan dianalisis menggunakan teknik analisis tematik.

Kesimpulannya menunjukkan bahwa Google Lens dipersepsikan positif karena membantu meningkatkan pemahaman kosakata, efisiensi waktu, dan motivasi siswa dalam membaca teks bahasa Inggris. Namun, tantangan juga teridentifikasi, termasuk ketergantungan siswa pada terjemahan instan dan akurasi terjemahan yang terbatas. Oleh karena itu, disarankan agar guru mendampingi penggunaan Google Lens agar berfungsi sebagai alat penunjang pembelajaran yang efektif dan tidak mengurangi kemandirian belajar siswa.

CHAPTER I

INTRODUCTION

This chapter discusses the theoretical basis of research on MA students' and teachers' perception of using Google Lens to assist in translating reading comprehension texts during English lessons, the research focus, research objectives, and the significance of the study, which includes theoretical and practical benefits, as well as definitions of key terms.

1.1 Background of the Study

Google Lens is an Artificial Intelligence (AI) powered program that uses a camera to identify items and deliver real-time information about them (Shapovalov et al., 2020). Google Lens has been utilized as an interactive educational tool to enhance students' scientific literacy and critical thinking skills (Putri & Widodo, 2022). Research by Bilyk et al., (2023) suggests that students' critical thinking abilities when studying biodiversity themes can be enhanced by incorporating Google Lens into the probing-prompting learning model. According to the study's findings, the average score increased from 47 to 81, and 84% of students responded favorably, demonstrating the effectiveness of this technology in raising educational standards. Students can develop their writing fluency, improve their language abilities, and explore their creativity in ways they never thought possible with the aid of these sophisticated chatbots (Albadri et al., 2022).

The use of Google Lens in language learning, including in the context of reading comprehension, demonstrates significant potential to support text understanding through its real-time translation and vocabulary identification features. As an application based on Optical Character Recognition (OCR), Google Lens is able to recognize written text from images and instantly translate and display the meanings of unfamiliar words or phrases for English language learners, thereby reducing linguistic barriers when reading complex texts. A study conducted by Rahmawati et al., (2024) found that the use of Google Lens effectively enhanced English vocabulary acquisition through direct, contextual translation. This finding is particularly relevant to reading comprehension, as vocabulary mastery is a fundamental component that strongly influences students' ability to understand main ideas and detailed information in texts.

Moreover, findings from a study conducted by Fauzi (2024) at UIN Malang indicate that Google Lens is effective in teaching reading comprehension through improving vocabulary knowledge among junior secondary school students. This improvement indirectly strengthens overall reading skills, as word understanding represents a crucial initial step in reading comprehension. These findings are consistent with the notion that technologies facilitating rapid access to word meanings and textual context can assist students in interpreting texts more accurately and efficiently.

The process of using Google Lens in reading comprehension begins when students take a photo of or scan an English text from textbooks or digital learning materials. The application then applies optical character recognition (OCR) to

extract the text and convert it into a digital form that can be translated or explained, allowing students to immediately view word meanings, sentence structures, or semantic explanations without relying on a manual dictionary. This feature is particularly beneficial for EFL (English as a Foreign Language) students who encounter texts rich in vocabulary and idiomatic expressions in learning materials or examinations. In the context of English language instruction at the secondary level, the integration of Google Lens into reading comprehension strategies enables students to engage in more autonomous learning while still interacting meaningfully with texts. The use of this tool not only helps students decode unfamiliar words but also enhances learning motivation due to the provision of rapid contextual feedback and an intuitive, user-friendly interface (Rahmawati et al., 2024).

Nevertheless, although preliminary studies indicate the positive impact of Google Lens on vocabulary development and initial text comprehension, academic literature that directly evaluates its effects on overall reading comprehension remains relatively limited. This gap highlights the need for further research that explicitly measures improvements in comprehensive reading skills, including students' abilities to integrate information, draw inferences, and critically evaluate textual content after interacting with the application (Rahmawati et al., 2024).

According to Subroto et al., (2023), technological advances have significantly transformed the educational process, introducing digital tools that enrich teaching and learning. Google Lens, a visual recognition tool that enables users to quickly translate words, recognize objects, and access information

graphically, is an example of such innovation (Nasrullah & Nafiah, 2023). Although its use has become widespread in everyday life, its implementation in classrooms, particularly in teaching English as a Second Language (ESL), has not been extensively explored in Mexico (Tula et al., 2025). This scenario shows that the majority of high school students have mobile devices, which facilitates the implementation of technologies such as Google Lens in the classroom (Tula et al., 2025). According to Gonzalez (2023), the use of Google Lens, combined with flashcards, facilitates vocabulary and grammar learning for English learners, reduces stress, and eliminates the costs associated with traditional materials.

Research conducted by Husnah et al., (2023). Quizizz's interactive elements have made it a popular choice among teachers. Quizizz introduced a new feature called Quizizz Paper Mode. Students' perceptions of Quizizz Paper Mode as a language evaluation tool in EFL classes are the main subject of this study. The study aims to investigate students' distinct perceptions and experiences of using Quizizz Paper Mode as a language assessment tool. The goal of the varied student form was to gather a varied sample of data. Their varied motivation and participation throughout their English learning journeys enhance the study's scope. According to the data collected, students found Quizizz Paper Mode to be an intriguing language evaluation tool that helped them become more self-assured, motivated, and proficient readers.

Tanasale and Suwarso (2024) stated that Google Translate is an AI program frequently used by teachers and students, from junior high school to college, to translate English texts. According to research by Andari et al., (2022) at Sekolah

Tinggi Agama Islam (STAI) Medan, 23 teachers who use Google Translate believe it provides quick and simple translation services. Most teachers agree that Google Translate is an inadequate translation tool, as it often produces grammatically inaccurate results. Despite the limitations of the tool, teachers nevertheless see its use favorably. In addition to discussing teachers' perceptions regarding Google Translate, the author offers research on students' perceptions of the service. As reported by Sabrina (2025), the study revealed that students' opinions were generally positive. Students checked the pronunciation, synonyms, and antonyms of an English word using Google Translate.

A study by Kusuma et al., (2024) found that Google Lens, which uses artificial intelligence and optical character recognition technology to translate text instantly using a mobile phone camera, has been an essential component in English language acquisition in Indonesia, particularly in recent years. This tool facilitates the translation of technical documents and online learning resources while also helping students and university learners understand English texts and improve their vocabulary. As observed by Rachmayanti and Alatas (2025), incorporating Google Lens into news-based learning improves students' motivation. It cultivates a favorable opinion of English, making the learning process more engaging and successful. As a result, Google Lens is recognized as a valuable and innovative tool for developing English proficiency among Indonesian university students.

Google Lens has proven to be a highly effective tool for teaching text comprehension and translation through vocabulary knowledge, especially compared to other technologies like ChatGPT or Google Translate (Purba et al.,

2024). While ChatGPT offers interactive learning and conversation-based practice, and Google Translate helps with basic vocabulary understanding through translation, both tools sometimes struggle to seamlessly integrate real-world context and physical text as Google Lens does. This advantage makes Google Lens a unique choice in the field of education.

Google Lens bridges the gap between conventional teaching techniques and contemporary technology by instantly scanning printed documents and providing definitions, synonyms, and contextual explanations (Nguyen, 2021). In addition to improving students' vocabulary, this method fosters a more dynamic and visual learning environment, both of which are crucial for adequate language comprehension. Because of this, Google Lens is a creative and approachable teaching tool.

In the context of digital technology advancements, the emergence of applications like Google Lens provides new support for English as a foreign language (EFL) readers in the process of comprehending text. Google Lens allows students to scan text directly, translate unfamiliar words or phrases, access visual meanings, and obtain additional explanations that help overcome vocabulary barriers, one of the main factors hindering reading comprehension (Bilyk et al., 2023). By providing instant, multimodal access to information, Google Lens has the potential to increase engagement, speed up the decoding process, and support the ability to understand main ideas and important details in text, thus strengthening the overall reading comprehension process without replacing the role of cognitive strategies that are still needed in reading (Toha et al., 2023).

Teachers' perceptions of the use of Google Lens in reading comprehension instruction generally reflect a positive attitude, as the application is considered effective in helping students understand foreign-language texts more quickly and contextually through its visual features and instant translation. Teachers perceive Google Lens as a supportive learning tool that can enhance student engagement, enrich vocabulary knowledge, and facilitate text interpretation, thereby making the reading process more effective and engaging. In line with this view, a study by Rachmayanti and Alatas (2025) indicates that Google Lens is effective in supporting text comprehension and language learning through the integration of visual-based technology, which has implications for the improvement of reading skills. Furthermore, a review by Herdina and Ningrum (2025) emphasizes that teachers tend to hold positive perceptions toward the integration of digital technology in English reading instruction because it can increase students' motivation and comprehension, although its successful implementation still depends on teachers' pedagogical readiness to manage technology use in the classroom.

Furthermore, Google Lens is quite appropriate for Madrasah Aliyah (MA) level students due to its ease of use and accessibility. Students can use this technology to explore instructional materials independently, eliminating the need for complicated interactions or extensive typing. The process of learning English is made more fun and functional by its ease of use, which also increases learning motivation (Kusuma et al., 2024). Teachers in the twenty-first century must

combine traditional instruction with contemporary technologies to meet the expected learning objectives (Aprilia et al., 2024).

However, studies conducted in educational contexts reveal that a significant percentage of MA students struggle to learn reading comprehension in English lessons. Their biggest challenge, which sometimes results in frustration, is memorizing and retaining new terms. Students usually use traditional dictionaries to learn new words; however, this approach is considered unfeasible because physical dictionaries are too large to transport and word searches take time (Hasan, 2024).

This problem is not unique to any one person; rather, it is a reflection of more general difficulties in language acquisition. According to Rahmawati et al., (2024), translation, as a change between languages, is an important phenomenon that interests researchers in several fields, including linguistics, psychology, ethnography, and literature. This assertion emphasizes how crucial reading comprehension knowledge is to translation and how it affects how well language is learned.

Based on this incident, the purpose of this study is to investigate more deeply the perceptions of teachers and students on how contemporary technology, more specifically, Google Lens, can help improve students' reading comprehension and application of English vocabulary according to curricular standards while offering access to fast and accurate translations. Therefore, this study is titled *"Investigating Students' and Teachers' Perception of Using Google Lens in Reading Comprehension: A Case Study in Madrasah Aliyah Attaraqqie Malang."* It

examines the perceptions of MA students and teachers regarding AI technology in the context of English language learning, specifically in the perceptions of students and teachers who use Google Lens. This technology can effectively and relevantly support the teaching and learning process.

1.2 Research Questions

1. What are MA teachers' perceptions regarding the benefits of using Google Lens for their students' ability in reading comprehension of English texts?
2. What are MA students' perceptions of the benefits of using Google Lens in enhancing their reading comprehension of English texts?
3. What challenges do MA teachers and students encounter when using Google Lens as a translation tool in reading comprehension of the English language learning?

1.3 Objectives of the Study

1. To investigate teachers' experiences with MA regarding the benefits of using Google Lens in enhancing the reading comprehension of the English text.
2. To investigate students' experiences with MA regarding the benefits of using Google Lens in enhancing the reading comprehension of the English text.
3. To identify the main challenges faced by MA students and teachers in using Google Lens for translation in reading comprehension of the English language learning.

1.4 Assumption of the Study

The methodology and direction of this research are based on several basic assumptions.

First, it is expected that MA students already know how to use camera-based apps like Google Lens in their daily lives and have access to technical gadgets like smartphones. This presumption reinforces the notion that they are already familiar with using Google Lens in a learning environment.

Second, it is believed that both teachers and students provide honest and thoughtful opinions about using Google Lens to learn English, especially when it comes to comprehending and translating texts. To provide genuine feedback on the application's efficacy, advantages, and difficulties faced during the learning process, participants are expected to have first-hand experience with it.

1.5 Significance of the Study

1. Theoretical Benefits

The results of this study may theoretically contribute to the body of knowledge regarding the use of AI-based technology in foreign language instruction. This study can serve as a reference for future researchers investigating the use of similar applications in educational environments, particularly in reading skills and English text translation, by shedding light on how teachers and students perceive Google Lens.

2. Practical Benefits

In practical terms, this study helps English teachers at the MA level by providing information about how Google Lens may be used as a cutting-edge teaching tool. Students' knowledge of how technology can be used to improve comprehension and dependent learning can also be expanded by this research. The study's conclusions can be used as a basis by curriculum designers and

teachers to create more flexible teaching strategies that take advantage of new developments in digital technology.

1.6 Scope and Delimitation

The purpose of this study is to investigate how MA teachers and students see the use of the Google Lens app for learning English, specifically with relation to comprehending and translating texts. Perceptions of the application's efficacy, usability, and learning impact are all included in the research's scope. This study also looks at the advantages and disadvantages of using Google Lens in a teaching setting.

The study is restricted to a particular population, which consists of English teachers employed by a specific educational institution and MA students registered in the city of Malang. In addition to not explicitly contrasting this application with other AI technologies, it skips over the technical details and algorithms of Google Lens. Furthermore, because the data was gathered using qualitative techniques like observations and interviews, the results are only helpful as a contextual case study and cannot be broadly applied.

1.7 Definition of Key Terms

Several key terms need to be clarified by the researcher to prevent any misunderstandings in interpreting the context of this study.

1. **Google Lens:** Google Lens is an image recognition-based application developed by Google that allows users to scan, identify, and translate printed and digital texts using a smartphone camera. In this study, Google Lens refers to its use as a learning aid in reading activities, specifically to

help students of Madrasah Aliyah Attarqqie Malang understand English reading texts through instant translation features, visual context, and vocabulary assistance.

2. **Students' Perception:** Student perceptions are the students' views, attitudes, beliefs, and responses to the use of Google Lens in reading comprehension learning. In this study, student perceptions focused on how students at Madrasah Aliyah Attarqqie Malang assessed the usefulness, ease of use, and utilization of Google Lens in assisting with comprehension of English reading texts.

3. **Teachers' Perception:** Teacher perception is defined as the views, assessments, and attitudes of teachers toward the use of Google Lens in reading comprehension instruction. In this study, teacher perceptions focused on how English teachers at Madrasah Aliyah Attarqqie Malang assess the pedagogical value, practicality, and impact and benefits of using Google Lens on students' reading comprehension and the classroom learning process.

4. **Reading Comprehension:** Reading comprehension is the ability to understand, interpret, and construct meaning from written text by integrating linguistic knowledge, background knowledge, and cognitive strategies. In this study, reading comprehension specifically refers to students' ability to comprehend English texts, including identifying main ideas, understanding vocabulary in context, and interpreting textual information with the support of Google Lens.

CHAPTER V

DISCUSSION

The research findings from the previous chapter are discussed in this chapter along with their connections to the theoretical framework and results of earlier investigations. To decipher the significance of the observational and interview data and explain their implications for English language learning, an inductive discussion is undertaken using Google Lens. As a result, this chapter's investigation not only explains the phenomenon but also examines how teacher and student perspectives relate to one another, the difficulties encountered during the learning process, and the strategies used to exploit the use of technology. To provide material for thought on future educational methods, this seeks to offer a deeper understanding of how Google Lens both supports and limits learning.

5.1 Teachers' Perceptions Regarding the Benefit of Using Google Lens in Reading Comprehension

5.1.1 Improving Time Efficiency in Reading Lessons

The findings of this study reveal that the use of artificial intelligence-based technology, such as Google Lens, in reading instruction contributes positively to students' comprehension, both in terms of time efficiency and creating a more conducive learning environment. Inductively, the teachers' experiences indicate that immediate access to the meaning of words and sentences enables students to

remain connected to the flow of the text without experiencing excessive cognitive barriers. This condition allows them to allocate mental resources to higher-order understanding, such as identifying main ideas and making inferences. This aligns with Cognitive Load Theory, which emphasizes the importance of reducing low-level linguistic processing so that learners can focus more on deeper comprehension. In this context, technology serves as a scaffolding mechanism consistent with Vygotsky's Zone of Proximal Development (ZPD), helping to narrow the gap between students' actual abilities and their potential development so that learning progresses more effectively. Previous research has also confirmed that digital tools can provide cognitive support in understanding texts, especially for second or foreign language learners who still face challenges in vocabulary and grammatical structures (Deng et al., 2022; Tsai & Liao, 2021; Wang et al., 2024).

In addition to cognitive benefits, the analysis reveals significant affective and pedagogical impacts. Students tend to feel more confident because they are no longer trapped in confusion when encountering unfamiliar vocabulary, resulting in a more positive and participatory classroom atmosphere. These findings support studies claiming that mobile technology, when integrated appropriately, can enhance motivation and reduce language anxiety since students feel more prepared to handle the challenges of English texts (Geng, 2024; Zhou et al., 2022). From a Mobile-Assisted Language Learning (MALL) perspective, the use of Google Lens that is supplemented with teacher clarification and meaning-focused discussions demonstrates the pedagogically aligned application of MALL principles, balancing teacher roles with digital tool integration to strengthen comprehension and learner

autonomy (Li et al., 2025; Wang et al., 2024). Here, teachers remain key figures, guiding interpretation and ensuring contextual accuracy so that learners do not rely solely on machine translation outputs.

Nevertheless, the findings also indicate that excessive reliance on Google Lens may hinder the development of critical reading strategies such as inference-making and contextual analysis, which has been cautioned in previous studies on machine-translation-assisted learning (Cancino & Panes, 2021; Fatkhurozi & Hidayat, 2024; Peng et al., 2024). Therefore, effective instruction should apply a combinational approach: technology is used as initial support to understand basic meaning, while teachers foster higher-order processing through post-translation activities like content analysis and meaning reflection. Within the Technology Acceptance Model and the Unified Theory of Acceptance and Use of Technology perspectives (TAM/UTAUT), perceived usefulness and ease of use emerge as major factors influencing teachers' decisions to integrate technology into instructional practice. Thus, innovations such as Google Lens have the potential to be sustained when they demonstrate real improvements in learning quality.

Based on these results, it can be affirmed that the integration of Google Lens into reading instruction at the secondary level not only accelerates learners' access to information but also helps create a more humanistic learning environment, reducing frustration while strengthening students' positive engagement with English texts. Therefore, this technology can serve as an innovative instructional strategy that enhances literacy competencies when kept under pedagogical control and designed to promote continuous knowledge-building. Previous studies

reinforce the argument that AI-based tools, when applied as guided and reflective supports, can bring transformative progress to language acquisition processes (Deng et al., 2022; Wahyunengsih & Murwantono, 2024). In this sense, the integration of Google Lens is not merely a technical shift in the classroom but a pedagogical step toward more inclusive, efficient, and empowering reading instruction that fosters learner autonomy in the digital era.

5.1.2. Students' Motivation and Reading Comprehension

The teachers' insights illustrate a significant yet nuanced impact of Google Lens on students' learning outcomes, particularly in reading comprehension. Their views reflect that the tool enhances motivation and supports students in comprehending English texts more efficiently. This aligns with technology-enhanced language learning theories, which assert that digital tools can improve engagement and facilitate comprehension when learners face linguistic challenges (Al-Said, 2021; Hapsari & Pratiwi, 2021). Students feel more confident when supported by instant translation features, which reduce frustration and sustain their concentration while reading. Such emotional and motivational improvements resonate with Krashen's Affective Filter Hypothesis, where anxiety reduction contributes to better language acquisition (Krashen, 1982). Moreover, students' awareness of errors in their initial understanding, as noted by the teachers, encourages metacognitive reflection, consistent with learner autonomy theory in digital learning environments (Dang & Nguyen, 2020).

However, despite these motivational and practical benefits, the teachers emphasize that Google Lens does not fully support deeper linguistic mastery.

Automatic translations often produce structural inaccuracies that make it challenging for students to understand grammar patterns and syntax relations within the text. This limitation is supported by studies highlighting that machine translation tools tend to oversimplify complex structures, thus failing to develop learners' analytical reading skills (Chen et al., 2023; Nugroho & Atmojo, 2020). Consequently, while Google Lens effectively supports surface-level comprehension, it lacks the pedagogical capacity to foster higher-order linguistic understanding necessary for academic reading proficiency. This demonstrates that technology functions best as a complementary support, not a substitute for explicit instruction, reinforcing the importance of teacher-mediated scaffolding as proposed in Vygotsky's Sociocultural Theory (Shadiev et al., 2022; Vygotsky, 1978).

Overall, the inductive interpretation of teacher perceptions reveals that Google Lens offers meaningful educational value by improving motivation, reducing cognitive load, and enabling more fluid engagement with texts. However, its pedagogical role remains partial and requires integration with instructional strategies that reinforce linguistic accuracy and critical reading skills. Achieving this balance ensures that technology does not merely promote dependence on translation but contributes to sustainable literacy development. Therefore, Google Lens should be positioned as a supplementary learning scaffold that enhances student participation and confidence while still relying on teacher expertise to develop deeper comprehension abilities and grammatical competence.

5.1.3 Supporting Tools for Efficient Reading Learning

Teachers' perceptions illustrate that the use of Google Lens in secondary-level reading instruction serves as a flexible pedagogical tool: employed situationally to clarify meaning when students encounter challenging English texts, and withheld when the teacher aims to foster students' independent comprehension. This alternating strategy reflects an instructional design that balances digital scaffolding with the development of learners' cognitive autonomy (Shadiev et al., 2022; Vygotsky, 1978). One teacher reported that they typically utilize Google Lens during lengthy reading passages in order to save instructional time, aligning with Cognitive Load Theory, which suggests that reducing low-level decoding processes can free working memory for higher-order comprehension tasks (Curum, 2021). At the same time, the process empowers students to focus on meaning rather than becoming stuck in word-by-word translation.

Moreover, the teachers noted affective and metacognitive dimensions: when students compare their own unaided understanding with the more coherent output of Google Lens, they experience a moment of self-reflection about their reading ability, a condition conducive to self-regulated learning (Deng & Yu, 2022; Lyu, 2025). From a Mobile-Assisted Language Learning (MALL) perspective, this practice aligns with the principle that educational technology is most effective when integrated with teacher mediation, rather than used in isolation (Li, 2022; Gutiérrez-Colón, 2020). Empirical evidence in recent years supports the notion that mobile tools can boost engagement and surface-level comprehension, while deeper

structural competence usually requires explicit instructional interventions (Chen et al., 2023; Liu et al., 2022).

Hence, the practical implication for reading instruction is that Google Lens should be embedded within a pedagogical sequence: (1) initial orientation and demonstration of the tool, (2) teacher-guided tasks that use the translation output for reflection, and (3) follow-up activities that reinforce analytical strategies and structural understanding (Tsegaw, 2024; Wang et al., 2024). This sequence mitigates the risk of over-reliance on automatic translation and ensures that the teacher remains central to interpreting meaning and guiding strategic reading development (Sutrisna, 2025).

This analysis affirms that Google Lens can enrich students' learning experiences by reducing frustration, accelerating engagement, and triggering self-reflection, provided that the teacher mediates its use thoughtfully and strategically. Recent studies highlight that the sustainability of benefits relies on integrating technology into lesson designs that prioritise higher-order skills rather than merely quick access to word meanings (Curum, 2021; Deng, 2022;). Ultimately, this finding recommends that Google Lens be positioned as an initial scaffold that supports participation and confidence, followed by teacher-led activities that cultivate linguistic structures, analytical reading abilities, and autonomous literate learners in the digital era.

5.1.4 The Impact of Motivation and Independent Thinking on Students in

Reading

In the context of technology-enhanced reading instruction, teachers' perspectives on the cognitive effects of using Google Lens become a crucial pedagogical and psychological consideration. Although the tool offers quick access to the meaning of texts, its implications for the development of students' literacy must be closely monitored to ensure effective learning. Teachers reported a dualistic impact: while Google Lens supports reading comprehension and reduces barriers when dealing with unfamiliar vocabulary, there are moments when students are less likely to retain vocabulary or actively process sentence structures on their own, alongside a noticeable tendency toward reliance on instant translation ("students become lazy to think and overly dependent"). This phenomenon echoes the concept of automation complacency, the idea that over-reliance on technological automation may weaken users' own active cognitive engagement (Parasuraman & Manzey, 2010).

From a language-learning perspective, instant translation tools may reduce lower-level cognitive load in vocabulary decoding; however, when too much cognitive work is outsourced to the tool, deeper reading skills, such as syntactic analysis, inferencing, and metacognitive monitoring, may stagnate (Liu et al., 2022). Teachers also recognized that the use of Google Lens increases motivation ("students become more motivated to read... they remain enthusiastic because they can understand texts more quickly"), aligning with Self-Determination Theory, which posits that enhanced feelings of competence support intrinsic motivation

(Deci & Ryan, 2000). Yet, higher motivation does not inherently translate into mastery of linguistic features if not accompanied by appropriate instructional support. Concerns emerged that excessive dependency on automatic translation may hinder grammatical understanding and students' independent construction of meaning ("students become less accustomed to forming and understanding sentence structures correctly"), reinforcing existing research that mobile tools often improve vocabulary acquisition but may not strengthen grammar or discourse skills without explicit instruction (Jedi-Sari-Biglar & Liman Kaban, 2023; Muslimah, 2025).

Therefore, the integration of Google Lens in reading activities appears to serve as an initial scaffolding mechanism, lowering comprehension barriers and fostering positive engagement, rather than replacing structured linguistic learning. This aligns with MALL (Mobile-Assisted Language Learning) principles, highlighting that technology becomes most effective when paired with teacher-guided reflection, analysis, and collaborative learning strategies (Kukulska Hulme & Viberg, 2018; Shadiev et al., 2022). Consequently, instructional design must ensure that Google Lens is implemented to support literal comprehension at an early stage of text interaction, while later tasks promote deeper understanding of grammar, critical thinking, and metacognitive awareness. Such a design prevents cognitive stagnation and preserves students' opportunities to actively process linguistic input.

From a humanistic standpoint, this analysis underscores that tools like Google Lens can enrich students' emotional and cognitive engagement, reducing frustration, supporting curiosity, and encouraging autonomy, provided they are

employed thoughtfully and strategically by educators. Recent studies further affirm that the long-term benefits of digital tools depend on how they are embedded within learning activities that sustain higher-order thinking rather than solely delivering instant access to meaning (Curum, 2021; Mihaylova et al., 2022;). Thus, integrating Google Lens is not merely a technical transformation in the classroom but a pedagogical step toward more accessible, engaging, and empowering reading instruction that preserves the development of students as independent and critical learners.

5.2 Students' Perceptions of the Benefit of Using Google Lens in Reading

Comprehension

5.2.1 Improving Students' Reading Comprehension and Self-Confidence

Based on the interviews conducted, the integration of Google Lens in English reading activities demonstrates a notably positive impact on students' learning experiences. Students reported that the application helps facilitate faster comprehension of English texts, especially when dealing with difficult vocabulary and complex grammatical structures. This finding indicates that Google Lens functions as a form of learning scaffolding that enables students to reach a level of comprehension they may not achieve independently, which aligns with Vygotsky's Zone of Proximal Development (ZPD) theory as applied in technology-supported language learning (Klimova, 2025). Moreover, by eliminating the need to manually search for word meanings, Google Lens helps to reduce students' cognitive load during reading tasks, supporting the principles of Cognitive Load Theory that

emphasize how technological tools can optimize cognitive processing during learning (Maharani et al., 2024; Rizki et al., 2023).

In addition to its cognitive benefits, Google Lens also generates affective improvements, particularly in enhancing students' confidence when reading English texts. This is consistent with previous studies indicating that translation technologies can improve learners' self-confidence by enabling successful comprehension more rapidly and accurately (Anggraeni, 2025; Rachmayanti, 2025). Such positive emotional outcomes reflect Bandura's concept of self-efficacy, which suggests that successful academic performance enhances learners' belief in their ability to engage with more challenging tasks (Andriani, 2025). Furthermore, this increased confidence helps to lower anxiety levels and other affective barriers to language acquisition, as described in Krashen's Affective Filter hypothesis (Mastang, 2024).

Another significant outcome is the development of independent learning behavior. Students expressed that they were able to understand English texts on their own without relying heavily on assistance from others. This finding corresponds with research emphasizing that Mobile-Assisted Language Learning (MALL) supports learner autonomy and intrinsic motivation in developing language competence (Sutrisna, 2025; Ziaei & Alsaedi, 2024). The result is strongly related to the Self-Determination Theory, which states that satisfaction of learners' autonomy and competence needs enhances long-term learning motivation (Sutrisna, 2025).

Nevertheless, the use of Google Lens still requires pedagogical monitoring. Despite the accelerated comprehension process, there is no clear indication that students consistently achieve deep comprehension or develop critical literacy skills. Several scholars warn that over-reliance on automatic translation may impede learners' natural development of linguistic knowledge and cognitive engagement with texts (Klimova, 2025; Sutrisna, 2025). Therefore, teachers must implement instructional strategies that maintain a balance between technological support and independent language processing, ensuring sustained vocabulary learning and critical reading skills.

The findings of this study clearly show that Google Lens offers positive contributions to the development of students' English reading skills through enhanced comprehension, increased confidence, and strengthened learning autonomy. These results reinforce empirical evidence that AI-based translation technology does not merely function as a translation tool but acts as a learning support system capable of shaping students' attitudes and strategies in a more effective and adaptive manner in 21st-century language learning environments (Rachmayanti, 2025).

5.2.2 Teacher Support and Intensity of Google Lens Use in Reading Activities

The integration of Google Lens into both classroom activities and independent study illustrates how digital tools can become routine yet strategic supports in English reading tasks. Students reported regularly using the application, photographing difficult passages and instantly accessing translations, particularly when faced with heavy reading loads and complex texts. This routine use reflects

the function of Google Lens as a digital scaffold aligned with Vygotsky's Zone of Proximal Development, enabling students to work beyond their autonomous capacities (Klimova, 2025). Moreover, by reducing manual searches for vocabulary and structure, the tool helps lower cognitive load, allowing students to allocate more mental resources to comprehending meaning rather than decoding (Jiang & Zhao, 2024; Maharani et al., 2024).

In addition, the contextual support from teachers, such as permitting and encouraging the use of Google Lens, contributes to a positive learning environment where students feel confident using the tool and taking on challenging texts. This external support fosters self-efficacy, as students experience success and develop stronger beliefs in their ability to read English texts (Andriani, 2025; Mastang, 2024). The situational use of the application, turning to it when a section is difficult, also signals metacognitive regulation and supports autonomous learning, consistent with the Mobile-Assisted Language Learning (MALL) paradigm (Sutrisna, 2025; Ziaei, 2024). Nevertheless, the findings caution that while Google Lens accelerates comprehension, it must be integrated with pedagogical strategies that ensure deep processing and prevent over-reliance on translation tools (Klimova, 2025; Ohashi, 2024).

5.2.3 Benefits and Potential Dependence of Using Google Lens in Reading

Based on the analysis of the research findings, the use of Google Lens in learning English reading skills presents pedagogical implications that must be comprehensively understood in relation to the development of students' digital literacy in the technology-enhanced learning era. The use of Google Lens provides

several positive contributions to the reading learning process. This application helps students comprehend text meaning more easily, enriches their vocabulary, and increases their motivation and confidence in reading. Previous studies have similarly reported that Mobile-Assisted Language Learning (MALL) technologies can enhance learner engagement and autonomy in language learning (Putri, 2025; Surdyanto, 2023). Theoretically, this aligns with Self-Determination Theory, which emphasizes the importance of competence and intrinsic motivation in supporting learning (Sanjaya, 2024). With instant access to translation, linguistic barriers in complex texts are reduced, allowing students to focus more effectively on content comprehension.

However, the findings also reveal pedagogical challenges arising from the tendency to rely excessively on automatic translation. Such dependence may hinder the development of metacognitive strategies and critical reading skills, as highlighted in studies concerning machine translation tools in language learning (Klimova, 2025; Kirchhoff, 2024). Therefore, teachers play a crucial role in providing scaffolding and controlling the use of technology, ensuring that Google Lens functions as a temporary support tool that gradually fosters learner independence (Murtisari, 2024; Sanjaya, 2024). Thus, the pedagogical impact of Google Lens can be optimized when its use encourages deeper comprehension rather than replacing essential cognitive processes in reading. Considering both its benefits and challenges, it can be concluded that Google Lens holds significant potential to enhance the quality of English reading instruction. However, its implementation should be accompanied by appropriate pedagogical strategies so

that the technology serves not merely as an instant assistance tool, but also as a medium that supports the continuous development of students' literacy skills.

5.3 Challenges Faced by Teachers in Using Google Lens

5.3.1 Students' Dependence on Google Lens and Its Impact on Reading

Independence

The implementation of Google Lens in reading comprehension presents several pedagogical challenges, despite the undeniable convenience the technology offers in facilitating text comprehension. Teachers observe that the ease of instant translation often reduces students' willingness to engage in independent reading and meaning-making. This phenomenon aligns with the concept of automation complacency, which suggests that users tend to experience decreased cognitive effort when automation performs tasks for them (Merritt et al., 2019; Parasuraman & Manzey, 2010). These findings are consistent with research in Mobile-Assisted Language Learning (MALL), which indicates that grammatical processing and discourse analysis may be overlooked when learners rely heavily on digital translation tools (Chen et al., 2023; Liu et al., 2022). Therefore, strong pedagogical regulation is required to ensure that technology serves as a supportive resource rather than a replacement for the learning process.

Beyond cognitive implications, psychological concerns also emerge, particularly regarding students' declining self-confidence in their reading ability. Comparisons between their own interpretation and Google Lens translations can lead learners to perceive their comprehension as inferior, contributing to reduced motivation and academic confidence. Previous research has shown that excessive

dependence on artificial intelligence can weaken critical-thinking skills and self-belief in academic decision-making (Zhai et al., 2024). This challenge contradicts the principles of self-regulated learning, which emphasize the importance of confidence, reflective thinking, and autonomous strategy use in achieving long-term academic success (Dewi et al., 2025). Thus, the role of teachers as facilitators of motivation and reflective learning remains essential when technology is integrated into reading instruction.

Given these findings, it is evident that while Google Lens offers substantial benefits in improving initial comprehension and supporting motivation, it also poses risks to cognitive independence and critical literacy if used without appropriate guidance. A recommended solution is the implementation of a structured learning model that positions technology as an initial scaffold and subsequently transitions students toward more analytical and reflective reading tasks requiring deeper cognitive involvement. This approach is supported by MALL theory, which states that the effectiveness of educational technology depends on pedagogical design and teacher scaffolding to foster higher-order learning engagement (Kukulska Hulme & Viberg, 2018; Sanjaya, 2023; Wang et al., 2024). With proper management, technology such as Google Lens can enrich students' literacy development without diminishing essential analytical and interpretive skills in English reading comprehension.

5.3.2 Google Lens as a Learning Support Tool

In the context of technology enhanced reading instruction, the integration of tools like Google Lens facilitates rapid access to word meanings and overall text

comprehension. However, teacher observations indicate that such convenience may inadvertently reduce students' efforts to internalize vocabulary and engage in deep processing of language. Research on Mobile-Assisted Vocabulary Learning (MAVL) underscores that while mobile tools increase vocabulary acquisition and retention compared to traditional methods, the most durable learning occurs when learners engage in retrieval practice and reflection rather than passive consumption of translations (Okumuş Dağdeler, 2023; Teymouri, 2024). This suggests that although Google Lens eases decoding, its use must be balanced with strategies that encourage active vocabulary learning and memory consolidation to sustain learners' lexical development.

From a linguistic pedagogical perspective, another challenge emerges when students rely on instantaneous translations without sufficient guidance in interpreting sentence structure, idiomatic usage, or word relationships. Automatic translations often render grammar and multi word expressions inaccurately, leading to misinterpretation of meaning or disrupted comprehension of ownership structures and idioms. Literature on Machine Translation (MT) in language education emphasizes that while MT supports access to meaning, it consistently falls short in capturing context, discourse nuance, and structure, thereby requiring human mediation to ensure linguistic understanding (Klimova et al., 2023; Naveen, 2024). Accordingly, teacher-mediated scaffolding remains indispensable for addressing the gap between instant translation and structural language comprehension, ensuring students understand not only what the text says but how it says it.

Pedagogically, these obstacles imply the need for a structured instructional design that positions tools like Google Lens as an initial scaffold rather than a standalone solution. An effective design would initiate with translation support to reduce frustration, move to tasks requiring students to reconstruct sentences, evaluate translation output, and apply new vocabulary in context, and finally integrate spaced repetition and metacognitive reflection to reinforce learning (Liu et al., 2022; Nawaz et al., 2023). This sequence aligns with Mobile-Assisted Language Learning (MALL) frameworks that highlight the importance of combining digital tools with teacher mediation, reflective activities, and active cognitive engagement. In this way, technology enhances accessibility and motivation without undermining the development of structural competence, strategic reading, and independent learning capacity.

5.4 Challenges Faced by Students in Using Google Lens

5.4.1 Dependence on Google Lens and Its Impact on Reading Independence

The analysis indicates that, although Google Lens and other automatic translation technologies provide significant convenience in understanding English texts, there are serious pedagogical implications related to over-reliance. When students tend to depend excessively on instant translation, their ability to read independently and develop critical thinking skills may be reduced. This phenomenon aligns with previous research showing that the use of Machine Translation (MT) in language learning can lead to over-reliance, which diminishes students' motivation to develop their own comprehension strategies and higher-order cognitive skills (Rahmawati, 2025; Sutrisna, 2025). From a cognitive

perspective, continuous use of such tools may limit deep processing, as students bypass the analytical processes that are crucial for critical reading and mental schema development (Li, 2023).

Pedagogically, the role of teachers is critical in balancing technology use and fostering students' independent skills. Educators need to implement scaffolding strategies that not only introduce Google Lens as a support tool but also guide students to use it strategically, for example, only in particularly difficult sections of the text, and encourage them to explain the meaning in their own words afterward. This approach aligns with constructivist theory, in which learners actively construct knowledge through interaction with material and are gradually given greater responsibility to internalize critical thinking processes (Sanjaya, 2024).

However, pedagogical constraints extend beyond cognitive aspects to motivational and ethical consequences. Over-reliance on MT can reduce students' ability to critically evaluate translation quality, particularly when automated outputs are inaccurate or lack context. Systematic studies on AI-assisted learning tools indicate that over-dependence may reduce analytical skills, decision-making, and reflective thinking when students accept AI outputs without questioning them (Zhai et al., 2024). Therefore, integrating Google Lens in English learning should be accompanied by digital literacy training and awareness of technology limitations (Alegra, 2025; Harsono et al., 2025). With proper guidance from teachers, students can use Google Lens not merely as a shortcut but as a temporary support tool that facilitates the development of deep literacy skills and independent learning.

5.4.2 Technical Challenges and Accuracy of Google Lens Translation

In addition to pedagogical challenges, the use of Google Lens in English reading instruction also presents obstacles related to text comprehension that need careful consideration. Although the application provides convenient instant translations, these translations are not always accurate, particularly for idiomatic expressions, culturally nuanced texts, or languages other than English. Inaccurate translations may affect students' understanding of the text, requiring them to verify and critically assess the meaning to avoid misinterpretation (Araghi & Palangkaraya, 2024; Moghe et al., 2025). This aligns with previous research emphasizing the importance of digital literacy and metacognitive reading strategies, enabling students to use technology critically and effectively (Leva et al., 2025; Naveen & Trojovský, 2024).

Moreover, technical factors such as unstable internet connections or low-quality cameras can further compromise translation accuracy and limit the effectiveness of Google Lens in supporting comprehension. Blurry images or low-resolution text often result in incorrect translations, hindering students' ability to understand the material fully (Dewayanti & Margana, 2024). These findings highlight that the effectiveness of educational technology depends not only on student skills but also on infrastructure and device quality. From a pedagogical perspective, teachers need to provide guidance and scaffolding so that students can use Google Lens strategically, such as only for particularly difficult sections, and then explain the meaning in their own words (Jung et al., 2024; Zhang et al., 2025). This approach aligns with constructivist and Vygotskian theories, where teachers

act as mediators in technology use to foster critical thinking and internalization of cognitive processes.

Therefore, to maximize the pedagogical benefits of Google Lens while minimizing its limitations, educational institutions should provide adequate technical infrastructure and equip students with digital literacy skills. With proper guidance from teachers, students can use Google Lens not merely as a shortcut but as a temporary support tool that enhances deep literacy development and fosters independent learning skills (Vashistha et al., 2022; Zhu et al., 2023; Zouhar et al., 2023).

5.5. Strategies to Overcome Challenges (Teachers' Perception)

5.5.1 Students' Dependence on Google Lens and the Decline in Reading

Independence

In the context of technology-enhanced reading instruction, teacher strategies play a crucial role in maximizing the benefits of Google Lens while preventing student overreliance on the application. Research indicates that the integration of educational technology must be carefully managed to support learning objectives without replacing students' critical thinking and independent comprehension skills (Chen et al., 2021; Stockwell, 2020). Rotational strategies, in which students alternate between using Google Lens and reading independently, have proven effective in maintaining this balance. Such an approach ensures that technology serves as a facilitative tool rather than a crutch, promoting both initial comprehension and active engagement with the text (Godwin-Jones, 2023; Lai et al., 2022).

Furthermore, reflective pedagogical approaches can enhance students' linguistic analysis and metacognitive skills. By encouraging students to compare automatic translations with manual grammar analysis, teachers support the development of critical evaluation and understanding of underlying language structures. This method aligns with constructivist learning principles, emphasizing active knowledge construction through reflection and critical engagement with content (Jonassen, 2020; Reinders & Wattana, 2020). Through guided discussions on textual meaning and grammar, students learn to interpret translations critically, deepening both their linguistic competence and their metacognitive awareness (Wang et al., 2023; Wang et al., 2023).

Overall, the combination of rotational usage and reflective pedagogical strategies demonstrates that Google Lens can function as an effective learning support tool while simultaneously fostering students' independent analytical abilities. The careful balance between technological assistance and teacher-guided reflection promotes not only rapid comprehension but also critical thinking and in-depth language analysis skills. These findings are consistent with the principles of Mobile-Assisted Language Learning (MALL), which emphasize the integration of technology, teacher mediation, and active cognitive engagement to enhance sustainable language learning outcomes (Liu et al., 2022; Teymouri, 2024). Consequently, the effective incorporation of Google Lens requires pedagogical strategies that optimize both accessibility and student autonomy.

5.5.2 Google Lens as a Learning Support Tool

In technology-enhanced reading instruction, the effective integration of applications such as Google Lens requires careful technical strategies to prevent student overreliance while fostering active engagement and analytical skills. Research in Mobile-Assisted Language Learning (MALL) indicates that combining multiple digital tools can enhance vocabulary acquisition, pronunciation, and syntactic awareness, thereby promoting a more comprehensive learning experience (Chen et al., 2021; Teymouri, 2024). By pairing Google Lens with supplementary applications, such as online dictionaries, students can expand their lexical knowledge and develop a deeper understanding of word structures and synonyms rather than relying solely on automatic translations. This approach highlights the importance of using technology not merely as a shortcut but as a scaffold that complements pedagogical goals, supporting independent learning and metacognitive reflection (Godwin-Jones, 2021; Wang et al., 2023).

Moreover, establishing clear boundaries regarding the use of Google Lens is crucial to maintaining students' independent reading and comprehension abilities. Studies show that excessive dependence on AI-based translation tools can reduce opportunities for critical thinking and analytical language processing (Liu et al., 2022). By designating the application as an auxiliary tool rather than the primary source of instruction, students are encouraged to engage actively with texts, analyze sentences, and construct meaning autonomously. This strategy aligns with constructivist and scaffolding frameworks in educational technology, which emphasize the necessity of teacher guidance and structured support to ensure

students internalize language skills while benefiting from digital assistance (Jonassen, 2020; Reinders & Wattana, 2020).

Overall, the technical strategies employed demonstrate that Google Lens can be effectively incorporated into reading instruction when guided by structured support, complementary tools, and clear usage boundaries. Integrating technology in this manner promotes initial comprehension, vocabulary enrichment, and pronunciation skills while preserving students' autonomy, analytical thinking, and metacognitive awareness. These findings reinforce the importance of a balanced approach to educational technology, where digital tools enhance learning efficiency and engagement without undermining critical cognitive processes or independent language development (Lai et al., 2022; Li & Wang, 2022; Stockwell, 2020; Teymouri, 2024).

5.5.3 The Role of Teachers in Controlling the Use of Google Lens

In technology-enhanced reading instruction, the implementation of pedagogical strategies is essential to ensure that applications like Google Lens support learning without diminishing students' independence. Research in educational technology highlights that teacher-guided instruction plays a critical role in mediating the use of digital tools, fostering active engagement, and enhancing cognitive skills (Jonassen, 2020; Reinders & Wattana, 2020). One effective approach involves alternating between sessions with and without technological aids, allowing students to practice comprehension and analysis independently. This strategy aligns with constructivist principles, emphasizing that learners develop deeper understanding and critical thinking skills when they are

actively involved in constructing meaning, rather than passively receiving translations (Godwin-Jones, 2021; Stockwell, 2020). By creating opportunities for independent reading, students can internalize vocabulary, reflect on sentence structures, and develop the capacity to interpret texts autonomously, which strengthens both literacy and metacognitive skills.

In addition, direct teacher guidance and interactive classroom discussions enhance the pedagogical effectiveness of technology use. Studies suggest that combining AI-assisted tools with structured supervision and collaborative reflection supports meaningful learning experiences (Chen et al., 2021). When students use Google Lens under teacher supervision, the technology functions as a scaffold rather than a replacement for critical thinking. Teachers can facilitate discussions that address translation inaccuracies, clarify linguistic ambiguities, and encourage students to analyze the overall meaning of texts. This approach also reduces the risk of overreliance on the application, ensuring that learners actively engage with texts while developing analytical and interpretive skills. Such reflective practices are consistent with Vygotsky's socio-cultural theory, which posits that cognitive development occurs through guided interaction and scaffolding within the learner's zone of proximal development (Jonassen, 2020; Wang et al., 2023).

However, integrating pedagogical strategies with technology enables a balanced approach where Google Lens serves as a supportive tool that accelerates comprehension while maintaining student autonomy and engagement. The combination of independent practice, teacher guidance, and classroom discussion ensures that students benefit from rapid access to information without

compromising critical thinking, text analysis, or literacy development. These findings underscore the importance of a holistic integration of educational technology with pedagogical practices to promote effective, sustainable, and meaningful learning outcomes (Lai et al., 2022; Li & Wang, 2022; Liu et al., 2022; Reinders & Wattana, 2020; Teymouri, 2024).

5.6. Strategies to Overcome Challenges (Students' Perception)

5.6.1 Optimizing Google Lens for Independent Reading Skill Development

Students' narratives reveal that the use of Google Lens not only serves as a comprehension aid but also motivates them to adopt intentional, self-regulated learning strategies that foster independence and deeper language development. For instance, by using the application as a means to learn new vocabulary consciously, they do not merely accept translations passively but transform technological support into an opportunity for sustained growth. This reflects principles of self-regulated learning theory, where learners actively set goals, apply strategies, and monitor their own understanding (Zimmerman, 2002). In mobile learning contexts, such agency is critical: MALL environments provide flexibility and immediate feedback, but learners must still orchestrate their own regulation to benefit fully (Viberg & Kukulska Hulme, 2021).

Moreover, students reported that they cross-check Google Lens translations with other tools like Google Translate or dictionaries, especially when the automated output feels inaccurate or incomplete. This dual strategy approach, combining digital translation with traditional language resources, demonstrates metacognitive awareness and a willingness to verify and refine meaning. It aligns

with constructivist learning theory, in which learners build their understanding by actively engaging with content and employing multiple cognitive resources. By doing so, students balance the efficiency of technology with the rigor of deeper language processing, thus reducing risks of superficial reliance (Handikaningtyas, 2025; Widiananda et al., 2023).

A particularly insightful strategy is attempting to understand parts of the text independently before resorting to Google Lens. This “pre-translation comprehension” process underscores their commitment to developing internal reading skills. It resonates with mobile learning research that emphasizes self-regulation and learner autonomy: when students have strategies to engage with text independently, technology becomes a scaffold rather than a crutch. Consequently, their use of Google Lens evolves into a purposeful supplemental tool, not simply a shortcut one that supports vocabulary growth, comprehension, and autonomy simultaneously. Such strategic practice reinforces digital literacy and lifelong learning dispositions, aligning with broader pedagogical goals in 21st-century education (Herliati et al., 2015; Maghfiroh et al., 2025; Risma et al., 2025; Zainuddin & Zumrudiana, 2024).

5.6.2 Translation Scanning and Verification Techniques to Improve Google

Lens Accuracy

Students’ technical strategies in using Google Lens demonstrate a high level of agency and adaptability. Rather than simply photographing entire pages at once, they deliberately capture texts in segments, sentence by sentence or section by section, to improve clarity and ensure more accurate OCR-based translations. This

approach reflects an understanding of how optical character recognition systems work, in which image quality, lighting, and text positioning significantly affect recognition accuracy (Angela et al., 2024). Such intentional manipulation aligns with self-regulated learning theory, as learners actively manage both cognitive and environmental conditions to optimize learning outcomes (Viberg & Kukulska-Hulme, 2021; Zimmerman, 2002;).

Additionally, students emphasized the importance of technical conditions, such as clear lighting, sharp text capture, and stable internet connectivity, to enhance translation accuracy. This demonstrates their metacognitive awareness of the interplay between device quality and learning effectiveness. Research in Mobile-Assisted Language Learning (MALL) has similarly highlighted that learners' success depends not only on technological tools but also on their ability to manage environmental and operational variables (Suryati et al., 2024). By adjusting text capture techniques and verifying translations with other applications or by rereading challenging segments, students engage in reflective practice, reducing misinterpretations and ensuring comprehension accuracy (Mayco Angela et al., 2024; Risma et al., 2025).

Finally, these technical strategies reveal a broader pedagogical insight: students act as active producers of their learning conditions, not merely passive recipients of technological input. Educators can further support this process by guiding image capture techniques, pre-scanning procedures, and quality checks, which can enhance translation accuracy and promote deeper engagement with texts. In this way, Google Lens functions not merely as a convenience but as a partner in

a thoughtful, self-regulated learning process, supporting vocabulary development, reading comprehension, and learner autonomy simultaneously (Viberg & Kukulska-Hulme, 2022; Zainuddin, 2024).

5.6.3 The Role of Teachers and Wise Use of Google Lens in Vocabulary

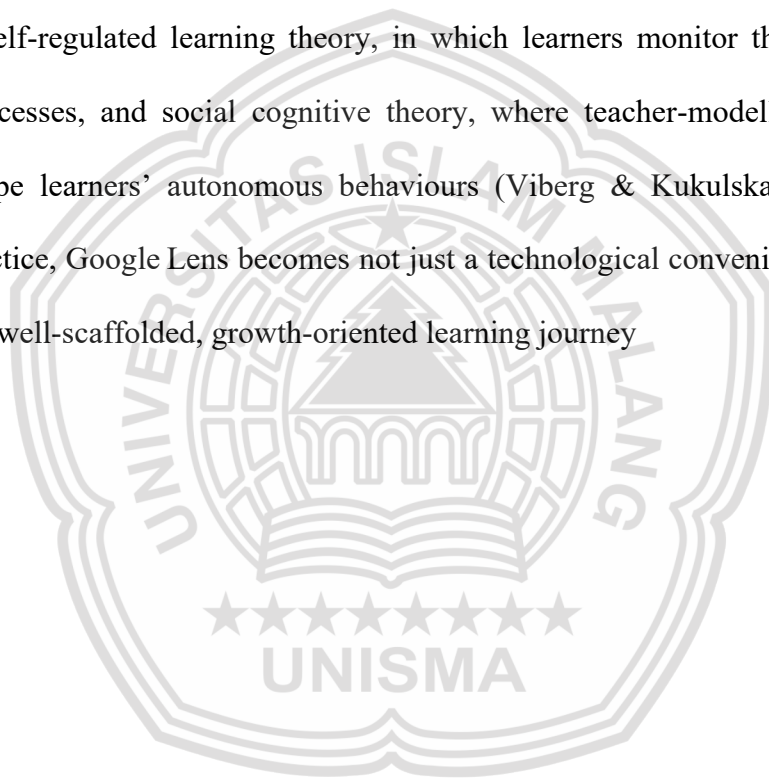
Learning

Teachers play a crucial facilitative role when integrating Google Lens into English language learning, ensuring that the convenience offered by technology does not undermine students' cognitive development, critical reading, and their capacity for autonomous learning. The deliberate guidance from teachers helps position Google Lens not merely as a shortcut but as a complementary tool: students use it to scaffold their understanding of complex vocabulary and linguistic structures, while still being encouraged to engage with meaning manually and critically (Apriliana, 2025). This aligns with the theoretical concept of scaffolding, where teachers provide temporary support that gradually fades as learners internalize skills (Putra et al., 2025).

Moreover, pedagogical strategies that emphasize balance, such as urging students not to rely solely on automated translation and to consult a dictionary or teacher when necessary, reflect a constructivist approach to learning. By integrating traditional learning resources (manual dictionaries or teacher feedback) with the affordances of digital tools, teachers encourage students to remain reflective and critical. This approach not only preserves but also strengthens their foundational reading and language analysis skills. Empirical studies on MALL interventions

show that teacher mediation is essential to prevent over-dependence on mobile learning tools and to promote meaningful learning (Etfita et al., 2025).

Finally, through these strategies, teachers help students cultivate an active, balanced, and reflective learning stance: they guide the judicious use of Google Lens, encourage verification of automated translations, and foster metacognitive awareness of when and how to use technology effectively. This aligns with self-regulated learning theory, in which learners monitor their own cognitive processes, and social cognitive theory, where teacher-modelling and feedback shape learners' autonomous behaviours (Viberg & Kukulska-Hulme, 2021). In practice, Google Lens becomes not just a technological convenience but a partner in a well-scaffolded, growth-oriented learning journey



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